FIE 2023
CONFERENCE
PROGRAM

Please visit our website for more information!
2023.fie-conference.org

SPONSORS

TECHNICAL CO-SPONSORS & LOCAL HOSTS
# Table of Contents

Table of Contents .................................................................................................................................. 2  
Welcome Message from the General Chairs ........................................................................................ 3  
Conference Organizers .......................................................................................................................... 5  
Conference Sponsors ............................................................................................................................ 7  
Technical Co-Sponsors & Local Hosts .................................................................................................. 7  
Exhibitors ............................................................................................................................................. 8  
Conference at a Glance .......................................................................................................................... 9  
Venue.................................................................................................................................................. 10  
2023 IEEE UNDERGRADUATE TEACHING AWARD ........................................................................ 11  
Detailed Program – Wednesday, October 18th .................................................................................... 12  
Detailed Program – Thursday, October 19th ....................................................................................... 17  
Detailed Program – Friday, October 20th ............................................................................................. 46  
Detailed Program – Saturday, October 21st ........................................................................................ 71
Welcome Message from the General Chairs

Howdy! It is our pleasure to welcome you to Aggieland, the Texas A&M University flagship campus in College Station, for the 53rd IEEE ASEE Frontiers in Education (FIE) International Conference! This year marks the first year the conference has been in person in the United States since 2020, and significant achievements for FIE, including a record number of abstract and paper submissions, as well as attendees.

In hosting this year’s conference on such an expansive campus, we hope you’ll find time to visit facilities like the George H.W. Bush Presidential Library & Museum, and the Memorial Student Center, or tour our many research and academic buildings on campus.

We have an impressive program for you this year, including multiple speakers from NSF, two keynote speakers, and an honorable speaker. FIE 2023 Keynote Speaker Dr. Leah Jamieson, Ransburg Distinguished Professor at Purdue University, will speak on Reflections on Change in Engineering Education. FIE 2023 Keynote Speaker Dr. Gary Bertoline, Distinguished Professor at Purdue University, will speak on Engineering the Inclusive Mindset for the Future: A Blueprint for Systematic Change in Undergraduate Engineering & Engineering Technology Education. FIE Honorable Speaker Dr. Idalis Villanueva Alarcón, associate professor at the University of Florida, will speak on Seekers, Bridgers, and Agents of Hidden Curriculum in Engineering. These talks, along with the rest of our program, will support this year’s FIE theme of achieving excellence in Engineering Education in a Diverse Global World.

We also have several exciting social events to strengthen our FIE community ties. On Thursday, October 19, at 6 p.m., we invite you to explore historic Downtown Bryan, a recognized Texas Cultural District, and home to the highest concentration of unique and locally owned shops and restaurants in the Bryan-College Station area. Take a self-guided tour of the downtown area, explore the many beautiful shops, and have dinner at one of the fantastic restaurants. Then join us at the Historical Stafford Theater for drinks and live music starting at 8 p.m. This event’s ticket will cover transportation to and from the Downtown Area, free entry to the Stafford Theater, and one complimentary drink.

On Friday, October 20, 6 - 9 p.m. join us for food, drinks, and music in the heart of the Texas A&M campus. The newly developed Aggie Park is just a five-minute walk from the conference venue. It hosts beautiful water features, an outdoor amphitheater, a performance pavilion, and plenty of places to sit, relax, and talk with other attendees. The event will include music, a buffet, a cash bar, and more. Your ticket includes a traditional Texas BBQ dinner and one complimentary drink.

It takes a mountain of dedicated individuals to put on a conference, and it has been a privilege for us to work with the staff and volunteers who have made this possible. We are deeply indebted to Noemi Mendoza Diaz and Saira Anwar for leading the six Technical Program Committee Members who managed the review process and compiled a fantastic program. From the Texas A&M support, a special thanks goes out to Amy Vance, Steven Begnaud, Drew Casey, Magda Lagoudas, and Anna Stepanova. Laura LeBlanc, and others from Conference Catalysts, LLC. deserve special applause for the infinite details they helped handle throughout the conference including awards, local arrangements, exhibits and industry relations, and publicity and public relations. Thank you to the Texas A&M College of Engineering and Texas A&M Engineering Experiment Station, as well as the students, faculty, and staff.
within, for their continued support and sponsorship throughout the process. Finally, it is important to appreciate the commitment of the FIE Steering Committee, ASEE ERM Division, IEEE Education Society, and the IEEE Computing Society for their continued commitment to ensuring that FIE remains the premier international research conference on engineering education across the globe, ensuring we continue to push the boundaries of excellence in engineering education. We give a strong round of applause for all the volunteers that have worked tirelessly to make FIE 2023 an overwhelming success.

We are honored to have served as the general chairs of the conference this year and excited to host the FIE community. We hope you will experience and get to know the magic of Aggieland during your time here. Thank you all for being part of the FIE community and improving the world around us, one engineering education paper at a time.

Dr. Tracy Hammond
Professor of Computer Science & Engineering
Director of the Institute of Engineering Education & Innovation
College of Engineering, Texas A&M University

Dr. Harry Hogan
Professor of Mechanical Engineering
Senior Associate Dean for Academic Affairs
College of Engineering, Texas A&M University
Conference Organizers

General Planning Committee

GENERAL CONFERENCE CO-CHAIR
• Tracy Hammond, Texas A&M University

GENERAL CONFERENCE CO-CHAIR
• Harry Hogan, Texas A&M University

TECHNICAL PROGRAM CHAIR - IEEE COMPUTER SOCIETY REP
• Noemi Mendoza Diaz, Texas A&M University

FINANCE CHAIR & TREASURER
• Steven Begnaud II, Texas A&M University

PUBLICITY & PUBLIC RELATIONS CHAIR
• Brady Creel, Texas A&M University-Qatar

REGISTRATION CHAIR
• Drew Casey, Texas A&M University

LOCAL ARRANGEMENTS CHAIR
• Anna Stepanova, Texas A&M University

STEERING COMMITTEE CHAIR
• Stephen Frezza, Franciscan University

Technical Program Committee

TECHNICAL PROGRAM VICE-CHAIR - ASEE ERM REP
• Saira Anwar, Texas A&M University

TPC (JR) MEMBER - ASEE ERM REP
• So Yoon Yoon, University of Cincinnati

TPC (JR) MEMBER - IEEE EDUCATION SOCIETY REP
• Claudio R Brito, COPEC

TPC (SR) MEMBER - IEEE EDUCATION SOCIETY REP
• Rosa M Vasconcelos, University of Minho

TPC (SR) MEMBER - IEEE EDUCATION SOCIETY REP
• Melany M. Ciampi, WCSEIT, IIE
Award Committee

HELEN PLANTS AWARD
• Rebecca Reck and Edmundo Tovar

DASHER BEST PAPER AWARD
• Jean Mohammadi-Aragh and Charles Wallace

NEW FACULTY FELLOWSHIP AWARD
• Racheida Lewis, Rosa Maria Castro, James Harland, and Michael De Miranda

Local Arrangements Subcommittee

LOCAL ARRANGEMENTS CHAIR
• Anna Stepanova, Texas A&M University

LOCAL ARRANGEMENTS CO-CHAIR
• Jose Quintana, AGX

LOCAL ARRANGEMENTS MEMBER
• Tom Ferris, Texas A&M University

Exhibits & Industry Relations Subcommittee

EXHIBITS & INDUSTRY RELATIONS CHAIR
• Cesar Malave, Texas A&M University-Qatar

EXHIBITS & INDUSTRY RELATIONS CO-CHAIR
• Magda Lagoudas, Texas A&M University

EXHIBITS & INDUSTRY RELATIONS MEMBER
• Pauline Wade, Texas A&M University

Publicity & Public Relations Subcommittees

PUBLICITY & PUBLIC RELATIONS CHAIR
• Brady Creel, Texas A&M University-Qatar

PUBLICITY & PUBLIC RELATIONS CO-CHAIR
• Amy Vance, Texas A&M University
Conference Sponsors

Technical Co-Sponsors & Local Hosts
Exhibitors

Engineering Education Transformations Institute
UNIVERSITY OF GEORGIA

FULBRIGHT Specialist Program

Texas A&M University Engineering
Graduate Programs

IEEE Education Society

Matrix

Texas A&M University Engineering
Meloy Engineering Innovation & Entrepreneurship Program

Polytechnic Institute

Nano Dimension
Electrifying Additive Manufacturing

PrairieLearn
The Grainger College of Engineering
University of Illinois Urbana-Champaign

TECHLABS
Houston, Texas
www.tech-labs.com | 1-800-445-1088

VIP Vertically Integrated Projects Consortium
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td></td>
<td>Welcome and Keynote Presentation, Leah H. Jamieson</td>
<td>Keynote Presentation, Gary R. Bertoline</td>
<td>Paper Presentations Block #11</td>
</tr>
<tr>
<td>8:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:00</td>
<td></td>
<td>Paper Presentations Block #3</td>
<td>Panel Sessions Block #7</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>9:30</td>
<td>Workshop Morning Session Block 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00</td>
<td></td>
<td>Paper Presentations Block #3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00</td>
<td></td>
<td></td>
<td>Paper Presentations Block #8</td>
<td>WIP Presentations Block #12</td>
</tr>
<tr>
<td>11:30</td>
<td></td>
<td></td>
<td></td>
<td>Posts, Student Panels, and Working Lunch</td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td>WIP Presentations Block #4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:30</td>
<td>TAMU Poster Presentation and Lunch</td>
<td>Lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:00</td>
<td></td>
<td>Lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:00</td>
<td>Workshop Afternoon Session Block 2</td>
<td>Special Sessions Block #5</td>
<td>Paper Presentations Block #13</td>
<td>Lunch &amp; Award Ceremony</td>
</tr>
<tr>
<td>14:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:00</td>
<td></td>
<td>Coffee Break &amp; Showcase</td>
<td>Coffee Break</td>
<td>END</td>
</tr>
<tr>
<td>15:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:00</td>
<td></td>
<td>WIP Presentations Block #14</td>
<td>Paper Presentations Block #10</td>
<td></td>
</tr>
<tr>
<td>16:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:00</td>
<td></td>
<td>WIP Presentations Block #14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:00</td>
<td>Welcome Reception</td>
<td>Social Event Downtown Bryan (tickets required)</td>
<td>Social Event AggiePark (tickets required)</td>
<td></td>
</tr>
<tr>
<td>18:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Venue

Texas A&M Hotel and Conference Center
177 Joe Routt Boulevard, College Station, Texas 77840

REGISTRATION WILL BE OPEN DAILY STARTING 30 MINUTES BEFORE THE FIRST SESSION

Exhibitors can set up on Thursday, October 19th from 8-10 AM.

The Doug Pitcock ’49 Texas A&M Hotel and Conference Center is located on the beautiful and historic Texas A&M campus. Housed in a striking glass tower across from Kyle Field and near the Memorial Student Center, the hotel and conference center provides stunning accommodations to host current and former students and their parents, wedding celebrations, meetings and conferences, Aggie football fans and visitors doing business with the university.

Our College Station hotel is contemporary, luxurious and spacious, with AAA Four-Diamond rated 250 upscale guest rooms and suites, a stunning ballroom and expansive and flexible meeting rooms. The property features state-of-the-art technology and inspiring spaces bathed in natural light designed to meet the IACC (previously International Association of Conference Centers) approved conference facilities standards.

With multiple dining outlets featuring fresh, locally sourced, Texas-centric ingredients, plus free Wi-Fi, a fitness center, business center and more, the Texas A&M Hotel and Conference Center has everything today’s discerning traveler needs for a restful and rejuvenating trip to College Station.
2023 IEEE UNDERGRADUATE TEACHING AWARD

Sponsored by the IEEE Education Society

CARLOTTA BERRY

For contributions to multidisciplinary robotics education and leadership in creating a national platform to diversify STEM

Carlotta Berry has a passion for increasing diversity in engineering. She is utilizing robotics and engineering education, as well as human-robot interaction research to bring STEM to diverse populations. She has built several organizations that reach out to women and marginalized and minoritized populations and encourage them to pursue STEM degrees. She founded the Rose Building Undergraduate Diversity (ROSE-BUD) program to increase the participation of underprivileged and underrepresented students in electrical and computer engineering. Berry worked with colleagues worldwide to start the nonprofits Black in Engineering and Black in Robotics that build community and advocate for diversity, equity, inclusion, and justice.

An IEEE Senior Member, Berry is the Rose Hulman Institute of Technology Lawrence J. Giacoletto Endowed Chair and professor for Electrical and Computer Engineering, Indiana, USA.
## Detailed Program – Wednesday, October 18th

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
<th>Topic and Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 – 12:00</td>
<td>W-1</td>
<td>REVEILLE I</td>
<td>Learn how to design high-quality qualitative educational research! - A workshop for</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>disciplinary STEM faculty by disciplinary STEM faculty</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>John R Morelock (University of Georgia, USA); Michelle Edith Jarvie-Eggart, PE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Michigan Technological University, USA); Heather Chenette (Rose-Hulman Institute</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>of Technology, USA); Sara Hooshangi (Virginia Tech, USA); Betsy Chestnutt</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(University of Tennessee Knoxville, USA); Sarah Wilson (University of Kentucky,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>USA); Azadeh Bolhari (University of Colorado Boulder, USA); Kirsten Dodson (</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lipscomb University, USA); Iglika Pavlova (University of North Carolina Greensboro,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>USA); Rebecca M. Reck (University of Illinois Urbana-Champaign, USA)</td>
</tr>
<tr>
<td>9:00 – 12:00</td>
<td>W-2</td>
<td>TRADITIONS</td>
<td>Incorporating Agility into the Academic Department</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Massood Towhidnejad, Omar Ochoa and James Pembridge (Embry-Riddle Aeronautical</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>University, USA)</td>
</tr>
<tr>
<td>9:00 – 12:00</td>
<td>W-3</td>
<td>CORPS I</td>
<td>What, So What, and Now What about Inclusive Mentoring for Diversity, Equity, and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inclusion?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Audrey Boklage (University of Texas at Austin, USA)</td>
</tr>
<tr>
<td>9:00 – 12:00</td>
<td>W-4</td>
<td>CORPS II</td>
<td>Supporting Student Success by Embedding Personal Narratives in Engineering Courses</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eric Jankowski, Krishna Pakala and Sara Hagenah (Boise State University, USA)</td>
</tr>
<tr>
<td>9:00 – 12:00</td>
<td>W-5</td>
<td>EAGLE</td>
<td>Designing and Running Project-Based Courses in Software Engineering Education</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(DREE)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Daqing Hou (Clarkson University, USA); David Shepherd (Louisiana State University,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>USA); Jan DeWaters, Yu Liu and Mary M Small (Clarkson University, USA)</td>
</tr>
</tbody>
</table>
Detailed Program – Wednesday, October 18th

9:00 – 12:00

**W-NSF: Proposal Writing Workshop [NSF-HSI]**
*Room: REVEILLE II*

**HSI Proposal Writing Workshop**
Sonja Montas-Hunter, Sonal Dekhane, Elsa Gonzalez, Frances Carter-Johnson

National Science Foundation’s (NSF) Improving Undergraduate STEM Education: Hispanic Serving Institutions (HSI Program) is a congressionally mandated program established in 2017. This program is aligned with the NSF’s commitment to a more diverse and capable science and engineering workforce. The HSI program is open to all HSIs, whether 2-year or 4-year, public or private. It aims to enhance the quality of undergraduate STEM education and increase the recruitment, retention and graduation of students pursuing undergraduate degrees in STEM. In this workshop, HSI program directors will provide an overview of the HSI program and guidance on writing competitive proposals. The workshop will focus on critical components of the proposal and the attendees will have an opportunity to understand NSF’s merit review process. An NSF Education Data Scientist will also provide guidance on developing robust and effective evaluations. Additionally, attendees will have an opportunity to hear from PIs about their experiences writing a successful proposal and implementing a successful project.

12:00 - 1:00

**L-3: Wednesday Lunch**
*Room: A&M Hotel Century Ballroom*

12:00 - 2:00

**TAMU-P: Texas A&M University Poster Session**
*Room: A&M Hotel Century Ballroom*

Description: Posters on engineering education research and innovation from Texas A&M faculty and students
- 12:00 pm – 12:30 pm – Lunch.
- 12:30 pm – 1:00 pm – Featured Posters (3) Stage Presentations (continuing to eat lunch)
- 1:00 pm – 2:00 pm - Poster Discussions (among the posters)

Presentations:

"Where Did My Stomach Go?"
Andrew Conkey

**Advancing Engineering Education: Investigating Effective Instructional Strategies and Promoting Educational Technological Innovations**
Saira Anwar, Umer Farooq, Syeda Fizza Ali, Daniel Bang, Ayden Perez

**Bringing Authenticity to Group Projects: Example from a Junior-Level Computer Science Course**
Shawna Thomas, Robert Lightfoot
Detailed Program – Wednesday, October 18th

Empowering Workforce Capabilities: The Gulf Coast Center of Excellence’s Educational Initiative
Digvijaysinh Barad, Umer Farooq, Saira Anwar, Matthew Elliott, Bryan Rasmussen

Enculturation and Computational Thinking
Noemi V. Mendoza Diaz, Deborah Trytten, Russ Meier

Engineering Education at the NUA2NCED Lab
Kristi Shryock

Engineering Enrichment Program for Qatar Aggies
Bilal Mansoor, Lana Ladki, Saira Anwar, Yasser Al-Hamidi

Industry Sponsored Capstones - Experiential Learning in Action
Pauline Wade

Monolithic Integration of Multi-Functional Complex-Oxides on Semiconductor for Integrated Photonics and Applications
Pao Tai Lin

Overview of Cyber-physical Systems Security and Intrusion Detection Systems
Hussein Alnuweiri, Ahmad Al-Khateed, Haitham Abu-Rub, Sertac Bayhan

Project-based Experiential Learning in a First-Year Engineering Programming Class Using the Engineering Design Cycle
Shana Shaw

Research Lifecycle & Publication in Engineering
Dianna Morganti

Research Tools to Educate Undergraduate Chemical Reaction Engineering, Catalysis, and Advanced Chemical Kinetics
Manish Shetty

SedimentSketch, Teaching Tool in and Beyond the Sedimentology Classroom
Anna Stepanova, Md Maklachur, Saira Anwar, Juan Carlos Laya, Carlos Alvarez Zarikiiian, Tracy Hammond

Sketch Recognition Lab Research
Tracy Hammond

Solar Texas: Building Capacity for Passive Survivability on the Road to Net-Zero
Filza Walter, Zofia Rybkowski, Gregory Luhan

TCORPS: Teams for Creating Opportunities for Revolutionizing the Preparation of Students
Arun Srinivasa, Rujun Gao, Luis Rodriguez, Emma Erdoga, Cynthia Hipwell, Mindy Bergman, Karan Watson, Guillermo Aguilar
Detailed Program – Wednesday, October 18th

Teaching Online Labs at Texas A&M College of Engineering
Garth Crosby, Bugrahan Yalvac

The Effects of Formative Assessment on Students’ Attitude Toward Learning and Design Skills: Perspective from a Senior-Level Design-Based Course
Muhammad Zilany, Iqra Yakub, Syed Ahmad

The Impact of 1-hr Bootcamp Course on Student Learning of a Biotransport Course
Hatice Ceylan Koydemir

The Impacts of TAMUS LSAMP Project: Over 30 years of Success
Karen Butler-Purry, Shannon Walton, John Avila, Niyazi Erdogan

UNITES: Undergraduate Improving Teamwork Skills
Jonathan Weaver-Rosen, Mohammad W Mohiuddin, Joanna Tsenn, Shadi Balawi, Carlos Corleto

Writing Assessment Training for Instructors
Joanna Tsenn, Jessie Cortez

2:00 – 3:20 PM
FIE Steering Opening Session
Room: Hullabaloo

2:00 - 5:00
W-6: Workshop Afternoon Session 6
Room: REVEILLE II

Preparing Competitive NSF Proposals of Engineering and Computing Education
Jumoke Ladeji-Osias, Abiodun Ilumoka, Christine Grant, Alexandra Medina-Borja, Subrata Acharya, Elsa Gonzalez, Sonal Dekhane and Huihui H Wang (National Science Foundation, USA)

2:00 – 5:00
W-7: Workshop Afternoon Session 7
Room: CORPS I

Articulating your Teaching Philosophy Statement and Portfolio: Connecting our Philosophies to Teaching
Frances Kalu (University of Doha for Science and Technology); Jean Layne (Texas A&M University, USA)

All participants are encouraged to bring a device (laptop or tablet) to work on during the workshop.
### Detailed Program – Wednesday, October 18th

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room</th>
</tr>
</thead>
</table>
| 2:00 – 5:00 | **W-8: Workshop Afternoon Session 8**  
How to become an inclusive leader  
Meagan Pollock (Engineer Inclusion, USA) | CORPS II   |
| 2:00 – 5:00 | **W-9: Workshop Afternoon Session 9**  
An IoT-Based CS Education Workshop for 9-12 and Undergraduate Students: Empowering the Next Generation of Technologists  
Pramod Abichandani, Craig Iaboni and Prateek Shekhar (New Jersey Institute of Technology, USA) | ROSS I     |
| 2:00 – 5:00 | **W-10: Workshop Afternoon Session 10**  
Exploring Virtual Reality Learning Environments  
Randy Brooks and Edgar J Rojas-Muñoz (Texas A&M University, USA); Britain J Thomas (USA); Katherine S Bezanson and Lara Soberanis (Texas A&M University, USA) | ROSS II    |
| 2:00 – 5:00 | **W-11: Workshop Afternoon Session 11**  
Using Personas as Holistic, Subjective Assessment Rubrics  
Anastasia Rynearson (Campbell University, USA) | TRADITIONS |
| 3:30 – 5:00 | **FIE Steering Executive Session (closed meeting)** | Hullabaloo  |
| 5:30 – 7:30 | **WR: Welcome Reception**  
Room: A&M Hotel Century Ballroom |            |
8:00 - 8:15
Plen-1: Welcome & Introductory Remarks
Room: A&M Hotel Century Ballroom

Dr. Joe Elabd will open the conference with a welcome from Texas A&M University and the College of Engineering. Dr. Elabd holds multiple roles, including Vice Chancellor for Research for The Texas A&M University System, Interim Vice Chancellor and Dean of Texas A&M Engineering, and Interim Director of the Texas A&M Engineering Experiment Station.

Moderated by Tracy Hammond & Harry Hogan

8:15 – 9:15
Plen-1: Keynote Speaker, Leah H. Jamieson
Room: A&M Hotel Century Ballroom

Reflections on Change in Engineering Education
Leah H. Jamieson (Purdue University, USA)

Leah Jamieson is Ransburg Distinguished Professor of Electrical and Computer Engineering at Purdue, Professor by courtesy in Purdue’s School of Engineering Education, and John Edwardson Dean Emerita of Engineering. She is co-founder and past director of the Engineering Projects in Community Service – EPICS – program, for which she was a co-recipient of the National Academy of Engineering (NAE) Gordon Prize for Innovation in Engineering and Technology Education. She was 2007 president of the IEEE, recently served as chair of the NSF Engineering Directorate’s Advisory Committee, as co-chair of the Computing Research Association Committee on the Status of Women in Computing Research, and is currently co-organizer of the Women of NAE (National Academy of Engineering) activities. Her service on report committees includes the steering committee for the NAE report Changing the Conversation: Developing Effective Messages for Improving Public Understanding of Engineering (2008) and co-chair, with Jack Lohmann, of the ASEE report Innovation with Impact: Creating a Culture for Scholarly and Systematic Innovation in Engineering Education (2012). Jamieson is a member of the NAE and the American Academy of Arts & Sciences and a Fellow of IEEE and ASEE. She holds a BS mathematics from MIT, a PhD in EECS from Princeton, and has been awarded honorary doctorates from Drexel and the New Jersey Institute of Technology.

9:30 - 11:00
PP-1: Pedagogical and Instructional Approaches #1
Room: MSC 2406 A

Characterizing Intercultural Competence among Cybersecurity Majors
Aparajita Jaiswal (Purdue University, West Lafayette, USA); Paul J Thomas and Tugba Karabiyik (Purdue University, USA)

Student Team Formation Using SCRUM
Asad Azemi (University of Maryland Eastern Shore, USA); Xiaoguang Ma (University of Wisconsin-Platteville, USA)
Detailed Program – Thursday, October 19th

Remotely multi-collaboration for the online teaching of architectural design: A pilot study based on a distributed version control solution
Ze Zhang, Yuneng Jiang and Peiyao Zhang (Soochow University, China); Chen Qian (Tongji University, China)

Impact of Study Groups on Students' Learning and Engagement: Across Different Online Formats of a Web-development Course
Debarati Basu (Embry Riddle Aeronautical University, USA); Sarah Heckman (North Carolina State University, USA)

Cooperative Learning and Co-Regulation: Exploring Students' Teamwork Strategies in Higher Education
Sakhi Aggrawal, Cristancho A Jorge, Devang Atul Patel and Alejandra J. Magana (Purdue University, USA)

9:30 – 11:00
PP-10: Professional Practice & Attitudes and Perceptions
Room: OAK

Impact of COVID-19 Pandemic on International Research Collaboration: A Pilot Survey Results
Fatemeh Pariafsai, Manish Kumar Dixit and Sherecce Fields (Texas A&M University, USA)

Exploring Contributions of U.S. Engineering Education Research Centers
Gadhaun Aslam and Idalis Villanueva Alarcón (University of Florida, USA)

Foundational Digital Forensics Skills and Learning: Exemplifying Social Justice
Denise Dragos and Suzanna Schmeelk (St. John's University, USA)

Aligning Manufacturing Skills when Implementing Industry 5.0
Rajesh Krishnamurthy (Oklahoma State University, USA); Sharon Harrison (Oklahoma Manufacturing Alliance, USA)

Improving Teamwork in Software Engineering Projects in Higher Education
Ser Wee Darren Quek, Jared Kai Fu Teo, Nasruddine Louahemmsabah, Yap Boon Cyrus Tong and Aaron Zheng Rong Poh (University of Glasgow, Singapore); Qi Cao and Chee Kiat Seow (University of Glasgow, United Kingdom (Great Britain)); Peter Chunyu Yau (University of Glasgow, Singapore); Alex Q. Chen (Singapore Institute of Technology, Singapore)

Exploring Undergraduate Engineering Students' Changing Beliefs About Smartness in Engineering
Cassie Wallwey (Virginia Tech, USA); Amy Kramer, Rachel L. Kajfez and Emily Dringenberg (The Ohio State University, USA)
Detailed Program – Thursday, October 19th

9:30 – 11:00
PP-11: K12 STEM Education #1
Room: TRADITIONS

A Math+CS curriculum from the Education and Mathematics Pre-Service Teachers Perspectives
Paris Kalathas and Jennifer Parham-Mocello (Oregon State University, USA)

Breonte S. Guy and Jinghua Zhang (Winston-Salem State University, USA); Stephanie T. Dance-Barnes (Depaul University, USA); Dawn N. Hicks Tafari, Kenneth J. Brown and Chad D. Markert (Winston-Salem State University, USA)

An Examination of Empirical Evidence Produced by a Decade of K-12 Computer Science Education Research
Julie M. Smith (CSEdResearch.org, USA); Monica M. McGill (CSEdResearch.org, USA & CSEdResearch.org, USA); Adrienne Decker (University at Buffalo, USA)

Comparative study of several educational robotics to introduce engineering and computing concepts for middle school and high school students
Sujing Wang and Stefan Andrei (Lamar University, USA)

Formal Specification in Basic Education: What does it take?
Braz A da Silva, Jr (Federal University of Pelotas, New Zealand); Simone A C Cavalheiro, Luciana Foss and Júlia Veiga da Silva (Federal University of Pelotas, Brazil)

Proposals for the promotion of computing in K-12 studies in Spain
David Lopez (Universitat Politècnica de Catalunya - BarcelonaTech, Spain); Faraón Llorens-Largo (Universidad de Alicante, Spain); Mercedes Marqués-Andrés (Universitat Jaume I, Spain); J. Ángel Velázquez-Iturbide (Universidad Rey Juan Carlos, Spain)

9:30 – 11:00
PP-2: Pedagogical and Instructional Approaches #2
Room: MSC 2406 B

Developing the numeric reasoning and mathematical modeling processes in engineering students using the LSEESC methodology
Daniel Sánchez Guzmán, Sr. and Erika Cervantes Juárez (Instituto Politécnico Nacional, Mexico)

Gamification in Computer Science Education: An Empirical Study of a Meme Contest
Daniel Lopez and Aldo Gordillo (Universidad Politécnica de Madrid, Spain); Edmundo Tovar (Universidad Politécnica de Madrid & Facultad de Informática, Spain); Pedro P. Alarcón (Universidad Politécnica de Madrid & UPM, Spain)
A comparison of the usefulness of game-based learning and video-based learning for teaching software engineering in online environments
Aldo Gordillo and Daniel Lopez (Universidad Politécnica de Madrid, Spain); Edmundo Tovar (Universidad Politécnica de Madrid & Facultad de Informática, Spain); Jesús Mayor (Universidad Politécnica de Madrid, Spain)

Software Engineering Education through Experiential Learning for Fostering Soft Skills
Maria Lydia Fioravanti (University of São Paulo, Brazil & Universidad Politécnica de Madrid, Spain); Bruna Oliveira Romeiro (University of São Paulo, Brazil); Leo Natan Paschoal (University of Sao Paulo, Brazil); Brauner Oliveira, Simone Souza and Ellen Barbosa (University of São Paulo, Brazil); Ana Moreno (Universidad Politécnica de Madrid, Spain)

Chatbots in Educational Recommender Systems: A Systematic Literature Review
Paulo C. R. Pinho and Tiago Thompsen Primo (Universidade Federal de Pelotas, Brazil)

9:30 – 11:00
PP-3: Pedagogical and Instructional Approaches #3
Room: MSC 2405

Exploring Machine Learning Methods to Identify Similar Code Groups for Programming Course Feedback
Xiaojin Liu, Hugo Castellanos, Lucas Wiese and Alejandra J. Magana (Purdue University, USA)

DSLP: A Web-based Learning Platform for Teaching Data Science to Non-Computer Majors
Xumin Liu (RIT, USA); Erik F Golen and Rajendra Raj (Rochester Institute of Technology, USA); Kimberly Fluet (University of Rochester, USA)

Towards Race and Gender Equity in Data Science Education
Brendan Baird (University of California Davis); Namya Radesh and Setareh Rafatirad (University of California Davis, USA); Hossein Sayadi (California State University Long Beach, USA)

CyberExpert: Towards an Automated Framework for Cybersecurity Expertise Acquisition and Mastery
Eman Hammad (University of Toronto, Canada & Texas A&M University, USA); William Hatcher (Texas A&M University Commerce RELLIS, USA); Tyler Harrison and Truman Brown (Texas A&M University Commerce RELLIS, USA)

A comparison of Peer Instruction and Process Oriented Guided Inquiry Learning-like pedagogies in teaching Software Testing and DevOps
Bhuvana Gopal and Stephen Cooper (University of Nebraska-Lincoln, USA)

An analysis of a Gamification application for Teaching and Learning Knowledge Management under the Qualitative and Affective Computing Contexts
Antonilson Alcantara, Sandro Ronaldo Bezerra Oliveira, Elziane Soares, Igor Costa, Raimundo Viegas, Emanuel Rodrigues and Elisiane Soares (Federal University of Pará, Brazil)
## Detailed Program – Thursday, October 19th

**FicWebBoard: A Playful and Collaborative learning platform built for all people and all programming languages**
Eddy Caron (ENS-Lyon, France); Nicolas Chappe (ENS de Lyon, France)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 – 11:00</td>
<td><strong>PP-4: Diversity and Broadening Participation #1</strong></td>
<td><strong>REVEILLE I &amp; II</strong></td>
</tr>
</tbody>
</table>

### Addressing Inequity in the Engineering Education Research Community: Asian Researchers’ Signaling Strategies to Counter Discrimination
Li Tan (Arizona State University, USA); Yong Bian (Zhejiang GongShang University, USA); Beijia He (Zhejiang Gongshang University, USA); Xingchen Xu and Archit Junagahare (Arizona State University, USA)

### Evolution of the participation of women in university Computer Science studies in Spain and in Europe
Angela Nebot and Francisco Mugica (Universitat Politècnica de Catalunya (UPC), Spain)

### Bringing More Girls to STEM: Initiatives within the Frontiers in Education Conference
Isabela Makiolka Montingelli (Pontificia Universidade Católica do Paraná, Brazil); Andreia Malucelli (Pontificia Universidade Católica Paraná, Brazil); Sheila Reinehr (Pontificia Universidade Católica do Paraná, Brazil); Carlos Silla (Pontificia Universidade Católica do Paraná, Brazil)

### Diversity in STEM+Computing MentorCorps Project
Shaoping Qiu (Texas A&M University); Malini Natarajarathinam, Francis Quek, Larry Powell, Ting Liu and Mehdi Gorjian (Texas A&M University, USA)

### The Impact of High School Region Socioeconomic Status on Computer Science Student Performance
Jennifer Alexandra Thompson, Margaret Ellis and Sara Hooshangi (Virginia Tech, USA)

### Diversity, Equity and Inclusion on STEM Education in Latin America
Sandra Milena Merchán-Rubiano (Centro de Diversidad, Equidad e Inclusión) and Juan Sebastián Sánchez-Gómez (Universidad El Bosque, Colombia); Andres E Acero (Tecnologico de Monterrey & Politecnico Grancolombiano, Mexico); Silvia B García de Cajen, Sra. (Universidad Nacional del Centro de la Provincia de Buenos Aires & Catedra Abierta Latinoamericana Matilda y Las Mujeres En Ingeniería, Argentina)

### Making engineering education more inclusive through the power of defaults
Matthew W Ohland (Purdue University, USA); Darryl Dickerson (Florida International University, USA); Stephanie Masta and Alice Pawley (Purdue University, USA)
### Detailed Program – Thursday, October 19th

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 – 11:00</td>
<td>PP-5: Professional Development #1</td>
<td>MSC 2404</td>
</tr>
</tbody>
</table>

**An Industry-Academy Partnership to Bridge the SES Gap in Engineering Education**

Pedro Quintero (University of Puerto Rico-Mayaguez, USA); Manuel Jimenez (University of Puerto Rico at Mayaguez, Puerto Rico); Carla Lopez del Puerto (University of Puerto Rico - Mayaguez, USA); Aida I. Santiago-Román and Sonia Bartolomei (University of Puerto Rico at Mayaguez, Puerto Rico); Luisa Guillermad (University of Puerto Rico - Mayaguez, Puerto Rico); Nayda G. Santiago (University of Puerto Rico, Mayaguez, USA); Nelson Cardona and Oscar Marcelo Suarez (University of Puerto Rico - Mayaguez, Puerto Rico)

**Enhance undergraduate research by incorporating an entrepreneurial mindset**

Maysam Nezafati (Georgia Institute of Technology, USA); Irene Reizman (Rose Hulman Institute of Technology, USA); Mary Lauren Benton (Baylor University, USA); John Peponis (Lawrence Technological University, USA); Michelle K Marincel Payne (Rose-Hulman Institute of Technology, USA); Blake Johnson (University of Illinois, USA); Kenneth Van Treuren (Baylor University, USA); Liping Liu (Lawrence Technological University, USA)

**Expectations of Skills and Knowledge in Traditional and Non-Traditional Industries for Chemical Engineering Graduates**

Ifeoluwa Priscilla Babalola (Texas A&M University, USA); Samantha Shields (Texas A&M University & Center for Teaching Excellence, USA); Debra Fowler (Texas A&M University, USA); Victor Ugaz (Texas A&M University, USA)

**The Evolution of Team Coordination Commitments in the Context of Computational Projects**

Joreen Arigye, Abasiafak Ndifreke Udosen, Joshi Parth Pravin and Alejandra J. Magana (Purdue University, USA)

**Understanding the Data Needs for Developing a Computational Model of Team Dynamics**

Novia Fan and Bowen Hui (University of British Columbia, Canada)

**Student perceptions of teamwork, conflict, and industry preparedness in engineering interdisciplinary capstone design**

Lisa Schibelius, Olivia Ryan and Susan Sajadi (Virginia Tech, USA); Mark Huerta (Virginia Tech & 33 Buckets, USA)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 – 11:00</td>
<td>PP-6: Curriculum and Course Development #1</td>
<td>CORPS I &amp; II</td>
</tr>
</tbody>
</table>

**Engineering Student Perspectives of a New Required Programming Course**

Jennifer Parham-Mocello, Jessica Garcia and Madelyn Sadler (Oregon State University, USA)
Detailed Program – Thursday, October 19th

Moving Beyond VHDL in Introductory Computer Architecture Courses: An Exploration of MyHDL as a Modern Alternative
Rafael Corsi Ferrao, Igor S Montagner and Renan Trevisoli (Insper, Brazil)

Analysis of Vlog Transcripts using Topic Modeling, Summarizer, and Cluster Analysis
Upmanyu Singh (The George Washington University, USA); Tiffany-Rose Sikorski (Graduate School of Education and Human Development, GWU, USA); Erica Wortham (George Washington University USA, USA); Ekundayo Shittu (The George Washington University, USA)

Rankings vs Realities: Exploring Competency Differences in Graduate Data Science Programs
Duo Li (Shenyang Institute of Technology, China); Elizabeth Milonas (CUNY New York City College of Technology, USA); Qiping Zhang (Long Island University, USA)

Penetration Testing and Ethical Hacking: Risk Assessments and Student Learning
Suzanna Schmeelk and Denise Dragos (St. John’s University, USA)

Promoting students’ cognitive ability to identify human error-prone scenarios in program
Fuqun Huang (University of Coimbra, Portugal)

9:30 – 11:00
PP-7: Curriculum and Course Development #2

Development of a Training Framework for Novel Accelerators
Zhenhua He (Texas A&M University, USA); Sandra B Nite, Abhinand Nasari and Hieu Le (Texas A&M University, USA); Jian Tao (Texas A&M University & Louisiana State University, USA); Dhruva Chakravorty, Lisa Perez and Honggao Liu (Texas A&M University, USA)

Towards Digital Skills for All Pre-service Teachers: Collecting Good Curricular Practices
Roland Ambros (University of Vienna, Austria); Dominik Dolezal and Renate Motschnig (University of Vienna, Austria)

Teaching Data Science to Non-Computer Science Students: A Learner-Centered Approach
Yllka Velaj and Dominik Dolezal (University of Vienna, Austria); Roland Ambros (University of Vienna, Austria); Claudia Plant (University of Vienna & DS UniVie, Austria); Renate Motschnig (University of Vienna & Faculty of Computer Science, Austria)

Use of SecureED as a Tool for Software Security Education: An Experience Report
Yi Liu (University of Massachusetts Dartmouth, USA); Onyeka Ezenwoye (Augusta University, USA)

Case Studies in Applying Design Thinking to Course Design in Computer Engineering
Diane Rover, Henry Duwe, Phillip Jones, Nicholas D Fila and Mani Mina (Iowa State University, USA)
**Detailed Program – Thursday, October 19th**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 – 11:00</td>
<td>PP-8: Education Level #1</td>
<td>EAGLE</td>
</tr>
<tr>
<td></td>
<td><strong>Employing a nuclear engineering case study to teach foundational concepts in Engineering Design and Innovation</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tina Baradaran and Mitchell Torok (University of New South Wales, Australia); Michael Myers (REA Foundation, Australia); Nicholas Gilmore, Ilpo Koskinen and Edward Obbard (University of New South Wales, Australia)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A Meta-Analysis of STEM Bridge Programs at Four-Year Colleges</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tram Dang (Purdue University &amp; Santa Monica College, USA); Joyce B. Main and Dan DeLaurentis (Purdue University, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Automating source code plagiarism detection in a Moodle-based programming course</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rodrigo Cardoso Aniceto (Universidade de Brasília, Brazil); Maristela Holanda (Texas A&amp;M University, USA); Dilma Da Silva (Texas A&amp;M University, USA)</td>
<td></td>
</tr>
<tr>
<td>9:30 – 11:00</td>
<td>PP-9: Computing #1</td>
<td>HULLABALOO</td>
</tr>
<tr>
<td></td>
<td><strong>A Systematic Literature Review on Performance Prediction in Learning Programming Using Educational Data Mining</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Choi Wan-Chong (Macao Polytechnic University, Macao); António José Mendes (University of Coimbra &amp; CISUC, Dep. of Informatics Engineering, Portugal); Chan-Tong Lam (Macao Polytechnic University, Macao)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EduBoost: An Interpretable Grey-Box Model Approach to Identify and Prevent Student Failure and Dropout</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Andy Qin (Plano West Senior High School, USA); Mihai Boicu (GMU, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performance Comparison between Sentiment Classification Models for Use in Chatbots in Virtual Learning Environments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Isadora Santos (Universidade Federal do Rio Grande - FURG &amp; Centro de Ciências Computacionais, Brazil); Regina Barwaldt (Federal University of Rio Grande (FURG), Brazil &amp; Center of Computational Sciences (C3), Brazil); Anderson Anderson Santos (Universidade Federal do Rio Grande - FURG, Brazil); Jeferson S Oliveira (Federal University of Rio Grande, Brazil); Luis Otoni Ribeiro (Universidade Federal do Rio Grande - FURG, Brazil)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enhancing Team Attendance Tracking in TBL Classes: A Comparative Study of LiDAR and Camera-based Systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Joseph Zuber, Ahmed M. Nazar, Ashraf Gaffar and Mohamed Y. Selim (Iowa State University, USA)</td>
<td></td>
</tr>
</tbody>
</table>
Detailed Program – Thursday, October 19th

Expanding Quantitative Approaches in Engineering Education Research: Embracing Empirical Bayes for Longitudinal Person-Centered Analysis
Xingchen Xu (Arizona State University, USA); Siqing Wei (Purdue University, USA); Li Tan (Arizona State University, USA)

FAIRifying STEM Data Ecosystem to Enhance Data Reuse
Phub Namgay (Uppsala University & Royal University of Bhutan, Sweden); Pema Wangdi, Sangay Thinley and Thinley Namgyal (Royal University of Bhutan, Bhutan)

Applying Educational Data Mining to Classify Students in an Intelligent Tutoring System for Algebra Instruction
Matheus F Menezes, José Francisco Magalhães, Netto and Arcanjo Lopes (Federal University of Amazonas, Brazil); Fabiann Matthaus Barbosa (Federal University of Amazonas and Federal Institute of Amazonas, Brazil)

11:00 - 11:30
B-1: Thursday Morning Break
Room: Second Floor Foyer & MSC 2401

11:30 - 1:00
WIP-1: Pedagogical and Instructional Approaches #4 [WIP]
Room: MSC 2406 A

Being Brave in a New World: Leveraging ChatGPT in Signal Processing Classes
Mahesh Banavar, Lavanya Shri, Nicholas Sparks and Alexander Cohen (Clarkson University, USA)

Eliciting student understanding in Structural Engineering Classrooms using Natural Language Models and Image Generation
Rolando Chacón (Universitat Politècnica de Catalunya, Spain); Homero Murzi (Virginia Tech, USA); Camilo Vieira (Universidad del Norte, Colombia)

Opening the Machine Learning Black Box for Multidisciplinary Students: Scaffolding from GUI to Coding
Mariana Arboleda and Camilo Vieira (Universidad del Norte, Colombia); Jennifer L Chiu (University of Virginia, USA)

Unleashing the Potential of Reinforcement Learning for Enhanced Personalized Education
Chelsea Fernandes (California State University Long Beach, USA); Tahereh Miari (California State Polytechnique University, USA); Setareh Rafatirad (University of California Davis, USA); Hossein Sayadi (California State University Long Beach, USA)

Integrating Generative AI with Evidence-based Learning Strategies in Computer Science and Engineering Education
Paula Lauren (Lawrence Technological University, USA); Paul Watta (University of Michigan-Dearborn, USA)
Detailed Program – Thursday, October 19th

Advancing Cybersecurity through Knowledge Conversion: Industry-Academia Interchange in a Doctoral Program
Andrew O. Hall, Michelle Liu and Diane Murphy (Marymount University, USA)

11:30 – 1:00
WIP-10: Diversity and Broadening Participation #3 [WIP]
Room: ROSS II

A Qualitative Exploration of an Assets-Based Approach to Building Engineering Transfer Student Capital
Kristin Frady and Randi J Sims (Clemson University, USA)

Exploring the Impact of a Supportive Scholarship Program on Engineering Transfer Students’ Learning Strategies
David A Copp (University of California, Irvine, USA); Anna-Lena Dicke (University of California Irvine, USA); Kameryn Denaro (University of California, Irvine, USA); Hye Rin Lee (University of Delaware, USA); Matthew Wolken (Irvine Valley College, USA); Analia Rao and Lorenzo Valdevit (University of California Irvine, USA)

WIP: Exploring the racialization of Latinos/as/xs in the U.S. Southwest and its implications on deficit ideologies in engineering education
Joel Alejandro Mejia (The University of Texas at San Antonio, USA)

Collaborative Institutional Efforts to Promote Hispanic Representation Across Computer Science
Mariana Alvidrez (New Mexico State University, USA); Jessica Rivera (The University of Texas - El Paso); Ann Gates (University of Texas at El Paso, USA); Sanga Kim and Elsa Villa (The University of Texas at El Paso, USA); Christian Teran Lopez (The University of Texas - El Paso); Karina Enriquez (The University of Texas- El Paso)

Democratizing engineering education: An online Bachelor of Science in Engineering degree
Nick A. Stites (University of Colorado - Boulder, USA); Janet L Yowell, Rhonda Hoenigman, William Kuskin and Abigail B Rose (University of Colorado Boulder, USA)

Co-Op Based Engineering Education Model Supporting Students in Engineering Education Deserts
Catherine McGough Spence and Jennifer Karlin (Minnesota State University, Mankato, USA); Eric James (Minnesota State University Mankato, USA)

11:30 – 1:00
WIP-11: K12 STEM Education #2 [WIP]
Room: REVEILLE I

A Topic Modeling Approach to Characterizing Colombian Teachers' Conceptions of Computational Thinking
Hugo Castellanos (Purdue University, USA); Camilo Vieira (Universidad del Norte, Colombia); Alejandra J. Magana (Purdue University, USA)
Detailed Program – Thursday, October 19th

Increasing Accessibility to Problem-Solving: A Skills-Focused Curriculum for High School Students
Alex Phan, Maysoon Dong and Curt Schurgers (University of California San Diego, USA)

Conducting Successful Virtual STEM Outreach
Colleen Bailey, Nicholas Chiapputo and Arthur Depoian II (University of North Texas, USA)

¿Funciona? Impact of FIRST robotics programs on minority students
Pilar Gonzalez (The University of Texas at El Paso, USA); Virgilio Gonzalez (University of Texas at El Paso, USA)

Navy STEM challenges: Innovative labs and activities with SONAR
Joni Corbin and Joni M. Lakin (University of Alabama, USA); Sathish Akula, Cheryl Seals and Edward Davis (Auburn University, USA)

An Ontology for Computer Science Student Profile
Sunny K. O. Miranda and Maria José Marcelino (University of Coimbra, Portugal); Paula Alexandra Silva (University of Coimbra Portugal, Portugal)

Culturally Relevant Areas of Opportunity for K-12 Computing Lessons
Jane Waite (Raspberry Pi Foundation & University of Cambridge, United Kingdom (Great Britain)); Anjali Das, Yujeong Hwang and Sue Sentance (University of Cambridge, United Kingdom (Great Britain))

11:30 – 1:00
WIP-12: K12 STEM Education #3 [WIP]
Room: REVEILLE II

Towards a Framework for Learning Content Analysis in K-12 AI/ML Education
Jane Waite (Raspberry Pi Foundation & University of Cambridge, United Kingdom (Great Britain)); Ethel Tshukudu (University of Botswana, Botswana); Veronica Cucuiat and Robert Whyte (Raspberry Pi Foundation, United Kingdom (Great Britain)); Sue Sentance (University of Cambridge, United Kingdom (Great Britain))

Work-In-Progress: Investigate Eye-tracking Metrics and Effectiveness of Visual Learning Aids in Online Learning Environments for Students with Learning Disabilities using Machine Learning
Yuexin Liu (Texas A&M University, USA); Wei Lu (Texas A&M University, USA); Amir Tofighi Zavareh and Ben Zoghi (Texas A&M University, USA)

STEM Training for Primary School Teachers with Remote Labs
Matthias Haack and Jutta Mágdefrau (University of Passau, Germany)

Engineering Human Body for Systematic and Computational Thinking
Chengzhang Zhu, Jeong Eun Ahn, Gina Tang, LuoBin Cui and Ryan Hare (Rowan University, USA)
Combining Gamification and Intelligent Tutoring Systems for Engineering Education
Ryan Hare and Gina Tang (Rowan University, USA)

11:30 – 1:00
WIP-13: Education Level #2 [WIP]
Room: EAGLE

Learning nuclear engineering in the workplace: Developing an understanding of on-the-job training of nuclear engineers in Australia
Tina Baradaran and Jennifer Stansby (University of New South Wales, Australia); Mihail Ionescu (Australian Nuclear Science and Technology Organisation, Australia); Chris Saint (Babcock International Group, Australia); Ilpo Koskinen and Edward Obbard (University of New South Wales, Australia)

Survey as a tool to identify the learning styles and strategies of first semester engineering students a review of Kolb’s test and cognitive metacognitive and motivational learning
Kevin Sleider Pabon Lobo, Sara M Quintero, Julian O Tarazona and Miguel A García (University Francisco de Paula Santander, Colombia)

Work-In-Progress: Preliminary Work Introducing Automated Code Critiques in First-Year Engineering MATLAB Programming
Laura Albrant, Pradnya Pendse, Mary E Benjamin, Michelle Edith Jarvie-Eggart, PE and Jon Sticklen (Michigan Technological University, USA); Laura Brown (Michigan Tech, USA); Leo C. Ureel II (Michigan Technological University, USA)

Work in Progress: Comparing Metrics of Student Success Across Academic Fields
Susan M. Lord (University of San Diego, USA); Russell A Long and Matthew W Ohland (Purdue University, USA); Marisa K. Orr (Clemson University, USA); Richard A Layton (Layton Data Display, USA)

The design process of the "ApeLab": a Fablab on wheels
Francesca Fiore and Alberto Montresor (University of Trento, Italy)

Research to Practice of Blended Learning in Computer Programming Course
Liang Buaa Zhang, Tianyi Chen, Yue Zong and Lijun Zhang (Beihang University, China)

Exploring the types of instructional practices used in a story-driven learning engineering classroom
Hye Yeon Lee and Joseph M. Le Doux (Georgia Institute of Technology, USA)
Detailed Program – Thursday, October 19th

Advanced Training in Industrial Robotics using Project-Based Learning and Design Thinking in a partnership between the university and industry
Jose Pinheiro Queiroz Neto (IFAM, Brazil); Micila Pereira (Federal Institute of Amazonas, Brazil); Jeanne Moreira de Sousa, Profa. (Instituto Federal de Educação & Ifam, Brazil); Nelson Alexandre Gouvea (LG Electronics do Brasil, Brazil)

Creating Tangible VR Spaces for Exploring Algorithm Complexity and Data Structures
Nathan Green (Marymount University, USA)

Cultivating Computational Thinking Through Game-Based Learning
Kelli Adam, Robert Lightfoot and Mahjabin Chowdhury (Texas A&M University, USA); Jonan P Donaldson (Oregon State University, USA)

What is Convergence?: A systematic review of the definition of and aspects of convergent work
Michael S. Thompson, R. Alan Cheville, Rebecca L Thomas, Stewart Thomas, Sarah Appelhans and Robert Nickel (Bucknell University, USA); Philip Asare (University of Toronto, Canada)

11:30 – 1:00
WIP-3: Pedagogical and Instructional Approaches #6 [WIP]
Room: MSC 2405

A framework for predicting the students at risk using AI and ML: A case study
Ramalingam Dharmalingam and Sowmya Baskar (Majan University College, Oman)

A Framework for an Intelligent Adaptive Education Platform for Quantum Cybersecurity
Ruchitha Mallipeddi, Chris Schaaf and Mahadevan Subramaniam (University of Nebraska at Omaha, USA); Abhishek Parakh (Kennesaw State University); Sherri Weitl-Harms (Creighton University & University of Nebraska at Kearney, USA)

Virtual Field Trip of the Central Heating and Chiller Plant as an Instructional Tool for Thermodynamics Education
Oai Ha (University of Wisconsin - Stout, USA); Seth Berrier and Keif Oss (University of Wisconsin-Stout, USA)

Developing Virtual Laboratory Modules for Broadening Experiential Learning in Engineering Education
Can Uysalel, Anshal Jain and Andrew Copeland (University of California San Diego, USA); Zachary Fox (UC San Diego, USA); Farbod Khoshnoud (California State Polytechnic University Pomona, USA); Maziar Ghazinejad (University of California San Diego, USA)

Computational Notebooks in a Finite Element Analysis Course: Engineering Students’ Reflections on the Value and Challenges of Computational Approaches
Camilo Vieira (Universidad del Norte, Colombia); David Restrepo (The University of Texas at San Antonio, USA); Jose L. De La Hoz (Universidad del Norte, Colombia)
Detailed Program – Thursday, October 19th

Assessing the Importance of Video Visualization Timings in a Flipped Classroom Context
Martín Liz-Domínguez and Manuel Caeiro-Rodríguez (University of Vigo, Spain); Fernando Mikic-Fonte (Universidad de Vigo, Spain); Martín Llamas-Nistal (Atlanttic - University of Vigo, Spain)

11:30 – 1:00
WIP-4: Professional Development #2 [WIP]
Room: MSC 2404

Core Competencies for Construction Project Management: Perception of the Global Academia
Fatemeh Pariafsai and Manish Kumar Dixit (Texas A&M University, USA); Stephen Mark Caffey and Edelmiro F. Escamilla (Texas A&M University, USA); Sherecece Fields (Texas A&M University, USA)

Integrating Cloud-Based AI in Software Engineers' Professional Training and Development
Patrick Wolfschwenger, Barbara Sabitzer and Zsolt Laviczza (Johannes Kepler University, Austria)

Improving Engineering Students' Success Using Academic Coaching
Reza Kamali-Sarvestani (California State University San Marcos, USA)

WIP: Using System Dynamics to Model and Analyze Interdisciplinary Teamwork
Chulin Chen and Courtney J Faber (University of Tennessee, USA)

11:30 – 1:00
WIP-5: Curriculum and Course Development #3 [WIP]
Room: CORPS I

Development of a π-shaped undergraduate curriculum using a curriculum continuity checkup process coupled with an iterative application of Kotter’s change model
Charles Patrick, Jr. and Michael McShane (Texas A&M University, USA)

NKU Applied Software Engineering Program: A Novel Approach to Software Engineering Education
Samuel Sungmin Cho, Nicholas Caporusso and Maureen Doyle (Northern Kentucky University, USA)
Implementing sustainability and resilience in an undergraduate construction management curriculum: Student’s knowledge and attitude
Dazhi Yang (Boise State, USA); Bhaskar Chittoori, Karen Krier and Kirsten Davis (Boise State University, USA)

A Decade-Spanning Longitudinal Study on the Curricular Complexity of Engineering Programs
David Reeping and Nahal Rashedi (University of Cincinnati, USA)

A Novel Methodology for Assessing Mechanical, Electrical, and Civil Engineering Programs With an Emphasis on Institutional Type
Lance L. A. White (Texas A&M University, USA); Tracy Hammond (Texas A&M University, USA); Karan Watson (Texas A&M University, USA)
Detailed Program – Thursday, October 19th

STEM Course Enhancement - Animated Safety modules for Freshman Circuit Class
Iftekhar I Basith, Suleiman Obeidat and Vajih Khan (Sam Houston State University, USA); Sumith Yesudasasan (University of New Haven, USA)

11:30 – 1:00
WIP-6: Curriculum and Course Development #4 [WIP]
Room: CORPS II

Technical writing method based on a three-point analysis and a slide-first principle
Akihiko K. Sugiyama (Yahoo Japan Corporation, Japan)

New concept of Innovation management education at graduate school
Koichiro Kato (Kanazawa Institute of Technology, Japan); Megumi Sako (Waseda University, Japan); Takako Akakura (Tokyo University of Science, Japan)

A semi-automatic knowledge discovery tool to identify and visualize course bottlenecks
Md. Nour Hossain (Indiana University Kokomo, USA); Mohammad Hasan (Purdue University Indianapolis, USA); Michael J Nelson (Indiana University Kokomo, USA); Enamul Enamul Haque (University of Waterloo, Canada)

Online Electrical Engineering Labs with Collaborative Open-Ended Assignments
Selahattin Sayil, Gleb Tcheslavski, Julia Yoo and Yuyao Wang (Lamar University, USA)

Preliminary Results of Modular Embedded Tool Implementation
Francis Pellicano, Christopher J Martinez and Maria-Isabel Carnasciali (University of New Haven, USA)

11:30 – 1:00
WIP-7: Computing #2 [WIP]
Room: HULLABALOO

Insights into Student Attention during Online Lectures: A Classification Approach Using Eye Data
Kritika Johari and Hui-Ching Chen (Singapore University of Technology and Design); W. Quin Yow (Singapore University of Technology & Design, Singapore); U-Xuan Tan (Singapore University of Technology and Design, Singapore)

Recognizing and Responding to Human Emotions: A Survey of Artificial Emotional Intelligence for Cooperative Social Human-Machine Interactions
Nicu Ahmadi (University of Texas - A&M & Stanford University, Connectivity Standards Alliance, USA); Tracy Hammond (Texas A&M University, USA)

Introduction to AI in Undergraduate Engineering Education
Santiago Isaac Flores-Alonso (Instituto Politécnico Nacional & Centro de Investigación En Cómputo, Canada); Noemi Mendoza (Texas A&M University, USA); René Luna Garcia (Instituto Politécnico Nacional, Mexico); Joseph Kapphahn, Olivia Mott and David Dworaczyk (Texas A&M University, USA)
Detailed Program – Thursday, October 19th

Work-In-Progress: Python Code Critiquer, A Machine Learning Approach
Pradnya Pendse, Laura Albrant and Daniel T Masker (Michigan Technological University, USA); Laura Brown (Michigan Tech, USA); Jon Sticklen, Michelle Edith Jarvie-Eggart, PE and Leo C. Ureel II (Michigan Technological University, USA)

11:30 – 1:00
WIP-8: Computing #3 [WIP]
Room: TRADITIONS

Crystal Viewpoints: Virtual reality viewpoint design for analytical measurement of crystal structures in Materials Science and Engineering
Timothy Pham, Shuyu Wang, Sarah Razook, Alyssa Curran, Jaskirat Singh Batra and Edgar J Rojas-Muñoz (Texas A&M University, USA)

Don't Walk Away! Virtual Safety Boundaries for Collaborative Virtual Reality Learning Environments
Raquel T. Cabrera-Araya, Yanwen Chen and Edgar J Rojas-Muñoz (Texas A&M University, USA)

Towards an Intelligent Tutoring System for Virtual Reality Learning Environments
Katherine S Bezanson and Lara Soberanis (Texas A&M University, USA); Britain J Thomas (USA); Randy Brooks and Edgar J Rojas-Muñoz (Texas A&M University, USA)

Cell Tour: Learning About the Cellular Membrane Using Virtual Reality
Hope Poulter, Logan Diebold, Sean Kelly, Samuel Pakalapati, Asha Rao and Edgar J Rojas-Muñoz (Texas A&M University, USA)

Investigating the Link between Students' Written and Survey-based Reflections in an Engineering Class
Ahmed Ashraf Butt, Filiz Demirci and Muhsin Menekse (Purdue University, USA)

Utilizing Automated Scaffolding Strategies to Improve Students' Reflections Writing Process
Saira Anwar (Texas A&M University, USA); Ahmed Ashraf Butt and Muhsin Menekse (Purdue University, USA)

Analyzing the factors that influence the timing of students asking questions and taking notes in online programming courses
Xiaonan Wang (Kobe University, Japan); Yi Sun (Kobe Institute of Computing, Japan); Yancong Su (Xiamen University of Technology, China); Kazuhiro Ohtsuki and Hidenari Kiyomitsu (Kobe University, Japan)
## Detailed Program – Thursday, October 19th

### 11:30 – 1:00

**WIP-9: Diversity and Broadening Participation #2 [WIP]**  
*Room: ROSS I*

<table>
<thead>
<tr>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than a checkbox: Exploring intersectional experiences of engineering students using the Social Identity Wheel</td>
<td>Rachel Figard (Arizona State University, USA); Yash Tadimalla (University of North Carolina at Charlotte, USA); Emma Dodoo (University of Michigan, USA)</td>
</tr>
<tr>
<td>Transnational higher education: diversity as challenge</td>
<td>Rosa Maria Vasconcelos and Emilia Araujo (Minho University, Portugal); Lara Campinho (University of Minho, Portugal); Marcia Silva (University of Beira Interior, Portugal)</td>
</tr>
<tr>
<td>About Us, Without Us: A Review of U.S. Disability-Related Institutional Policies and Practices</td>
<td>Rachel Figard, Samantha Brunhaver and Jennifer Bekki (Arizona State University, USA)</td>
</tr>
<tr>
<td>Towards iVProg4All: an accessibility test with blind</td>
<td>Marcos Devaner Nascimento (Universidade de São Paulo, Brazil); Anarosa A. F. Brandão (Universidade de São Paulo &amp; Escola Politécnica, Brazil); Leônidas O Brandão (University of São Paulo, Brazil); Tiago Melo Casal (União Brasileira de Faculdades - UNIBF, Brazil)</td>
</tr>
<tr>
<td>International Collaboration to Increase Access to Educational Robotics for Students</td>
<td>Milan Dahal (Tufts University &amp; Center for Engineering Education and Outreach, USA); Lydia Kresin (Tufts University, USA); Eduardo Pereira (Federal University of São João Del-Rei &amp; UFSJ, Brazil); André Peres (IFRS - Campus Porto Alegre, Brazil); Chris Rogers (Tufts University, USA)</td>
</tr>
<tr>
<td>Exploring Faculty Members’ Conceptualizations of Diversity, Equity, and Inclusion in Engineering Education</td>
<td>Isil Anakok (Virginia Tech, USA); Justin L Hess and Sowmya Panuganti (Purdue University, USA); Andrew Katz (Virginia Tech, USA)</td>
</tr>
</tbody>
</table>
Detailed Program – Thursday, October 19th

1:00 - 2:00
L-1: Thursday Lunch & Honorable Speaker
Room: A&M Hotel Century Ballroom, MSC 2400

Seekers, Bridgers, and Agents of Hidden Curriculum in Engineering
Idalis Villanueva Alarcón, Ph.D. (University of Florida, USA)

Bio: Dr. Idalis Villanueva Alarcón is an Associate Chair for Research and Graduate Studies and a tenured Associate Professor of Engineering Education at the University of Florida. In 2019, she received the White House Office of Science, Technology, and Policy's Presidential Early Career Award for Scientists and Engineers (PECASE) award for her 2017 National Science Foundation CAREER project on hidden curriculum in engineering.

Abstract: Hidden curriculum (HC) represents the unacknowledged and oftentimes “hidden” lessons or messages in a working or learning environment that hinder marginalized groups from navigating their environments successfully. HC propagates structurally through social networks and interactions, transferring a context's norms, values, and beliefs to the learner. In this talk, we will explore the traits of individuals (seekers, bridgers, and agents) as they become aware of the HC around them.

2:00 - 3:30
SPS-1: [SPECIAL] Refining Your Advising Approach: Effective Strategies for Mentoring Graduate Students
Room: MSC 2406 A

Refining Your Advising Approach: Effective Strategies for Mentoring Graduate Students
Rachel L. Kajfez (The Ohio State University, USA); Mayra S. Artiles and Holly Matusovich (Virginia Tech, USA); Amanda M Singer (The Ohio State University, USA)

2:00 – 3:30
SPS-10: [SPECIAL] Using Scalable Competency in Computing and Engineering Education
Room: HULLABALOO

Using Scalable Competency in Computing and Engineering Education
Alison Clear (EIT, New Zealand); John Impagliazzo (Hofstra University, USA); Judith Gal-Ezer (Open University, Israel); Marisa Exter (Purdue University, USA)

2:00 – 3:30
SPS-11: [SPECIAL] Uncovering the Hidden Curriculum: Finding Dispositional Expectations
Room: MSC 2404

Uncovering the Hidden Curriculum: Finding Dispositional Expectations
Stephen T Frezza (Franciscan University of Steubenville, USA); Mihaela Sabin (University of New Hampshire, USA); Marisa Exter (Purdue University, USA)
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
</tr>
</thead>
</table>
| 2:00 – 3:30  | **SPS-12: [SPECIAL] Crazy Idea: What If We Use Engineering to Develop and Deliver Engineering Education?**<br>
Room: MSC 2405 | Bror Saxberg (LearningForge LLC and IEEE ICICLE, USA); Emily Marasco (University of Calgary, Canada); Jim Goodell (IEEE LTSC & QIP, USA) |
| 2:00 – 3:30  | **SPS-2: [SPECIAL] Honing the craft of conducting interviews in engineering education research**<br>
Room: MSC 2406 B | Sindia Rivera-Jimenez (University of Florida, USA); James Huff (Harding University, USA); Jerrod A Henderson (University of Houston, USA); Amy Brooks (Oregon State, USA) |
| 2:00 – 3:30  | **SPS-3: [SPECIAL] FIE Special Session - Developing Our Growth Mindset to Support Student Success**<br>
Room: ROSS I | Sharon Mason (Rochester Institute of Technology, USA) |
| 2:00 – 3:30  | **SPS-4: [SPECIAL] Disabled Student Experiences in Engineering: How to Improve Our Classroom Accessibility**<br>
Room: ROSS II | Ariel Chasen, Emily Landgren and Maura Borrego (University of Texas at Austin, USA) |
| 2:00 – 3:30  | **SPS-5: [SPECIAL] Let's talk about leaving: A special session on departure from the engineering doctorate for administrators, advisors, mentors, and graduate students**<br>
Room: CORPS I | Catherine Berdanier and Gabriella M Sallai (Pennsylvania State University, USA) |
## Detailed Program – Thursday, October 19th

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00 – 3:30</td>
<td><strong>SPS-6: [SPECIAL] Understanding international student’s struggles using Funds of Identity theory with an intersectional lens</strong></td>
<td>CORPS II</td>
</tr>
<tr>
<td></td>
<td><strong>Understanding international student's struggles using Funds of Identity theory with an intersectional lens</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tiantian Li, Cristian Vargas-Ordonez and Siqing Wei (Purdue University, USA)</td>
<td></td>
</tr>
<tr>
<td>2:00 – 3:30</td>
<td><strong>SPS-7: [SPECIAL] Finding Belonging in Engineering Education: A Contemplative Approach</strong></td>
<td>REVEILLE I</td>
</tr>
<tr>
<td></td>
<td><strong>Finding Belonging in Engineering Education: A Contemplative Approach</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yevgeniya V Zastavker (Olin College of Engineering, USA); Madhvi J Venkatesh (Vanderbilt University, USA)</td>
<td></td>
</tr>
<tr>
<td>2:00 – 3:30</td>
<td><strong>SPS-8: [SPECIAL] Sex, Gender, and Engineering: Exploring and Addressing Sexual Harassment</strong></td>
<td>REVEILLE II</td>
</tr>
<tr>
<td></td>
<td><strong>Sex, Gender, and Engineering: Exploring and Addressing Sexual Harassment</strong></td>
<td></td>
</tr>
<tr>
<td>2:00 – 3:30</td>
<td><strong>SPS-9: [SPECIAL] Moral and Civic Virtues in Engineering: Reimagining Engineering Ethics to Produce Virtuous Engineers</strong></td>
<td>TRADITIONS</td>
</tr>
<tr>
<td></td>
<td><strong>Moral and Civic Virtues in Engineering: Reimagining Engineering Ethics to Produce Virtuous Engineers</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Olga Pierrakos, Adetoun Yeaman and Kyle Luthy (Wake Forest University, USA); Mary Gentile (Giving Voice to Values, USA)</td>
<td></td>
</tr>
<tr>
<td>3:30 - 4:30</td>
<td><strong>EXH-1: Exhibitor Showcase</strong></td>
<td>First Floor Hotel Lobby</td>
</tr>
<tr>
<td>4:30 - 6:00</td>
<td><strong>WIP-14: Pedagogical and Instructional Approaches #21 [WIP]</strong></td>
<td>MSC 2406 A</td>
</tr>
<tr>
<td></td>
<td><strong>Training Students to Establish and Maintain Positive Group Dynamics in Design and Design-based Classes</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Katie Ansell, Holly Golecki and Rebecca M. Reck (University of Illinois Urbana-Champaign, USA); Christopher Schmitz (University of Illinois at Urbana-Champaign, USA); Joe Bradley and Jessica TerBush (University of Illinois Urbana-Champaign, USA)</td>
<td></td>
</tr>
</tbody>
</table>
Detailed Program – Thursday, October 19th

Assessing the impact of curriculum integration on the intercultural learning gains of first-year computer science students
Aparajita Jaiswal (Purdue University, West Lafayette, USA); Laura Starr and Aletha D Stahl (Purdue University, USA)

Building holism in engineering education: An experimental perspective
GS Mani (IEEE Pune Section); Neha Sharma (University of Pune, India)

Exploring Design and Implementation of a Robotic-Coding Camp in Teacher Education
Pelin Yueksel Arslan and Fares Kayali (University of Vienna, Austria)

Work in Progress Paper - Learning Software Quality Assurance using Audits
Pauline Wade (Texas A&M University, USA); Tracy Hammond (Texas A&M University, USA); Saira Anwar (Texas A&M University, USA)

Creative geotechnical engineering education module based on an educational game using Multiphysics Enriched Mixed Reality
LuoBin Cui, Weiling Cai, Ryan Hare, ChenChen Huang, Gina Tang and Cheng Zhu (Rowan University, USA)

Safeguarding Authenticity: Strategies for Combating AI-Generated Plagiarism in Academia
Peter Ilic and Nicholas Carr (University of Aizu, Japan)

4:30 – 6:00
WIP-15: Pedagogical and Instructional Approaches #22 [WIP]
Room: MSC 2406 B

The Roles of Student Staff In Engineering Makerspaces
Audrey Boklage (University of Texas at Austin, USA)

On Positionality and the Implementation of Experiential Learning for Engineers
Hortense Gerardo (University of California, San Diego, USA); Brainerd Prince (Plaksha University, India)

Work in Progress: Creating a "Mechanical Engineering Teaching Community of Practice" for faculty learning and sharing pedagogical changes and innovation
Rujun Gao, M Cynthia Hipwell, Karan Watson, Mindy Bergman and Guillermo Aguilar (Texas A&M University, USA); D. Chris Seets (Texas A&M University, USA); Arun Srinivasa (Texas A&M University, USA)

Application of Organizational Systems Theory to Identify Education and Training Needs for Industry 4.0
Kandi D Pomeroy (Texas State University, USA); Malini Natarajarathinam (Texas A&M University, USA); Shaoping Qiu (Louisiana State University-Shreveport, USA); Lei Xie (Texas State University, USA); Michael Johnson (USA)
Detailed Program – Thursday, October 19th

**Exploratory Learning in Engineering Programming**
Campbell R. Bego (University of Louisville & J. B. Speed School of Engineering, USA); Angela Thompson, Cenetria Crockett, Raymond Chastain, Jeff Hieb, Linda Fuselier, Ryan J Patrick and Marci DeCaro (University of Louisville, USA)

**Designing active and experiential remote laboratories: Key factors from the perspective of teachers designing learning activities**
Hector R. Amado-Salvatierra (Universidad Galileo, Guatemala); Miguel Morales Chan and Rocael Hernandez-Rizzardini (Galileo University, Guatemala); Milvia Rosales (Universidad Galileo, Guatemala)

---

4:30 – 6:00
**WIP-16: Pedagogical and Instructional Approaches & Others [WIP]**
*Room: MSC 2405*

**The evaluation of the problem-based approach with Think-Pair-share method for teaching in Electronics Engineering Technology Program**
Moftah Ali and Jafar Al Sharab (Northwestern State University of Louisiana, USA)

**An Ontology and Management System for Learning Outcomes and Student Mastery**
Sarah A Reynolds, Omar Ochoa and William C Pate (Embry-Riddle Aeronautical University, USA)

**Work-in-progress: Sociotechnical modules for the Introduction to Circuits Course**
Susan M. Lord (University of San Diego, USA); Cynthia J Finelli (University of Michigan, USA)

**An innovative experimental teaching method of hardware-software co-design-Taking a hardware accelerator of neural network using FPGA**
Ying Li (Beijing University of Aeronautics and Astronautics, China); Jingzhuo Liang, Yangdong Liu, Wei Huang, Yue Yan and Xianglong Liu (Beihang University, China)

**Choose Your Own Adventure: empowering students to combine structured and open Challenge-Based Learning**
Jessica Lucchetta and Tommaso Carraro (University of Trento, Italy); Milena Stoycheva (Junior Achievement Bulgaria, Bulgaria); Maurizio Marchese and Lorenzo Angeli (University of Trento, Italy)

**What Drives Undergraduate Engineering Students to Engage in Project Based Learning: A Case of Curriculum Reform in a Chinese University**
Yanpin Ren, Yongheng Jiang and Xiaofeng Tang (Tsinghua University, China)

**Intelligent tutoring for large-scale personalized programming learning based on knowledge graph**
Ying Li (Beijing University of Aeronautics and Astronautics, China); Jincheng Qiu, Runze Yang and Tongyu Zhu (Beihang University, China); Sheng Hao (Beihang University, China); ShiJie Gui (Beihang University, China); Yu Liang (Beijing University of Technology, China)
### Detailed Program – Thursday, October 19th

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:30 – 6:00</td>
<td><strong>WIP-17: Professional Development #7 [WIP]</strong></td>
<td>MSC 2404</td>
</tr>
<tr>
<td></td>
<td><strong>WIP: Beyond the Cognitive: Educator readiness for Fostering Dispositions</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deepti Tagare, Jafar Tavakoli and Marisa Exter (Purdue University, USA); Mihaela Sabin (University of New Hampshire, USA); Stephen T Frezza (Franciscan University of Steubenville, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>A Preliminary Investigation of the Ethics Policy Concerns of Artificial Intelligence: Insights from AI Professionals Working in Policy-Related Roles</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qin Zhu and Dayoung Kim (Virginia Tech, USA); Hoda Eldardiry (Virginia Polytechnic and State University, USA); Michelle C Ausman (Virginia Tech, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Secondary Data Analysis as a Research and a Training Tool: First-Year Engineering Experiences</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Keanu Richards, Grant Goodall and Yevgeniya V Zastavker (Olin College of Engineering, USA); Rachel L. Kajfez (The Ohio State University, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Digital Competences of Industrial Systems and Technologies Engineering Graduates in a Central Mexico Institution</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Martha P Robles Gutiérrez (Universidad Politécnica de Pachuca, Mexico); Noemi Mendoza (Texas A&amp;M University, USA); Lourdes E Del Razo Robles (UnadMexico, Mexico); Eric Simancas Acevedo (Polytechnic University of Pachuca, Mexico)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>An Experience Report on Teachers' Training for Unplugged Gamified Teaching in Brazil</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Isabelle Melo do Nascimento and Luiz Oliveira da Silva Junior (Universidade Federal da Paraíba, Brazil); Wilk Oliveira (Tampere University, Finland); Pasqueline Dantas and José Rocha do Amaral Neto (Universidade Federal da Paraíba, Brazil)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Micro-Credential Digital Badges in Engineering and Computing at an MSI: The Student's Perspective (Work in Progress)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mais Kayyali, Morgan McKie, Claudia Calle Muller, Maimuna Begum Kali, Mohamed Elzomor and Alexandra C Strong (Florida International University, USA)</td>
<td></td>
</tr>
<tr>
<td>4:30 – 6:00</td>
<td><strong>WIP-18: Assessment #6 [WIP]</strong></td>
<td>CORPS I</td>
</tr>
<tr>
<td></td>
<td><strong>WIP: Developing an Instrument to Measure Adaptability among Engineering Students</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Samantha Brunhaver and Cecilia La Place (Arizona State University, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Work in Progress: Large Language Model based Automatic Grading Study</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rujun Gao (Texas A&amp;M University, USA); Naveen Thomas and Arun Srinivasa (Texas A&amp;M University, USA)</td>
<td></td>
</tr>
</tbody>
</table>
Detailed Program – Thursday, October 19th

Formative-Assessment Freirean-Dialogue API for Data-Analytics Trainee-Teachers
Wassim Mahfouz and Heinz- Dietrich Wuttke (Technische Universität Ilmenau, Germany); Sara Werner (SNIPIN UG, Germany)

Formative Assessment Practices in High School Classrooms - Experiences of a High School Teacher Teaching Engineering Design Curriculum
Assad Iqbal (The Ohio State University, USA); Adam R Carberry and Medha Dalal (Arizona State University, USA)

How Do I Start?: A Tiered Approach to Homework
David Schmidt and Robert J Kerestes (University of Pittsburgh, USA)

4:30 – 6:00
WIP-19: Assessment #7 [WIP]
Room: CORPS II

Was it active learning all along?: Investigating the effectiveness of the mode of exposure to Bloom’s Taxonomy-based assignments in an undergraduate Fluid Mechanics course
Phapanin Charoenphol, Haejune Kim and Arkasama Bandyopadhyay (Texas A&M University, USA)

Determination of Students' Misconceptions Using the Electric Circuit Concept Diagnostic (ECCD) Instrument
Olanrewaju Paul Olaogun, Jacob Martin Foster, Zin Lin, Adel Al Weshah, Kun Yao and Nathaniel Hunsu (University of Georgia, USA)

Enhancing Evaluation and Feedback in Computer Organization Labs with an Automated RISC-V Processor Verification Framework
Yichuan Gao, Ziang Liu, ShanShan Li and Weidong Liu (Tsinghua University, China)

Expert Feedback on Engineering Sketching Skills for Object Assembly Tasks
Hillary E. Merzdorf (Texas A&M University, USA); Donna Jaison (Texas A&M University, USA); Tracy Hammond (Texas A&M University, USA); Julie Linsey (Georgia Institute of Technology, USA); Kerrie A. Douglas (Purdue University, USA)

Using Continuous Competency-Based Assessment as a Success Support Service in Higher Education
Sébastien Combéfis (Computer Science and IT in Education ASBL & AEI Consulting, Belgium)
Coding Like a Data Miner: A Sandbox Approach To Computing-Based Data Science for High School Student Learning  
Justice T Walker (The University of Texas at El Paso & ABC Learning Lab, USA); Amanda Barany (Drexel University, USA); Alex Acquah (The University of Texas at El Paso, USA); Sayed Mohsin Reza (Pennsylvania State University Harrisburg, USA); Alan Barrera and Karen A Del Rio Guzman (The University of Texas at El Paso, USA); Michael Johnson (University of North Texas, USA)

Generating and Understanding Predictive Models for Student Attrition in Public Higher Education  
Tiago de Souza Fernandes and Guilherme N Ramos (University of Brasilia, Institute of Exact Sciences, Brazil)

Task-fidelity assessment for programming tasks using semantic code analysis  
Leon Wehmeier (OWL University of Applied Sciences and Arts, Germany); Sebastian Eilermann (Helmut Schmidt University, Germany); Oliver Niggemann (HSU, Germany); Andreas Deuter (OWL University of Applied Sciences and Arts, Germany)

Adopting Model Eliciting Activities in an Undergraduate Software Engineering Course through Real-World Projects  
Young Lee (Texas A&M University-San Antonio, USA); Jeong Yang (Texas A&M University-San Antonio, USA); Young Rae Kim (Texas A&M University San Antonio, USA)

Reveal Online Learning Clickstream Data to Provide Actionable Intelligence  
Patrick Seeling (Central Michigan University, USA); Michael P McGarry (University of Texas at El Paso, USA); Matthew Johnson (Central Michigan University, USA)

Investigating Cognitive Engagement in a Collaborative Desktop Virtual Reality (VR) Statics Based on the ICAP framework  
Isaac D Dunmoye, Runu P Das, Dominik May, Nathaniel Hunsu, Olanrewaju Paul Olaogun and Siddharth Savadatti (University of Georgia, USA)

Co-sharing secondary qualitative research data to understand technology adoption in engineering education courses  
Michelle Edith Jarvie-Eggart, PE (Michigan Technological University, USA); Dominik May and Deborah Moyaki (University of Georgia, USA); Katrina Carlson (Michigan Technological University, USA); Landon Smith (University of Georgia, USA)
### Detailed Program – Thursday, October 19th

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:30 – 6:00</td>
<td><strong>WIP-21: Design #3 [WIP]</strong></td>
<td><strong>TRADITIONS</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Exploring Possibilities of AI-enabled Image Synthesis and Design in Education</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yanwen Chen and Xin Li (Texas A&amp;M University, USA); Ashish Kumar (Texas A&amp;M University, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>The Interplay of First-year Engineering Students' Engineering Design Reasoning and Quality of the Sources for Problem Framing</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jenny Quintana-Cifuentes (University of Louisiana Monroe, USA); Ying Ying Seah (Oakland City University, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Co-Creating a Model of Empathy in Engineering Design</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elizabeth A Sanders and Justin L Hess (Purdue University, USA); Nicholas D Fila (Iowa State University, USA); Allison Godwin (Cornell University, USA); Corey Schimpf (University at Buffalo, USA &amp; Finger Lakes Trail Conference, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Design and Implementation of Extensible Online Experimental Teaching Platform Based on Message Queuing Mechanism</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ziang Liu, ShanShan Li and Ninghan Zheng (Tsinghua University, China)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Extending the Usability of WebTA with Unified ASTs and Errors</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Joseph Roy Teahen, Daniel T Masker and Leo C. Ureel II (Michigan Technological University, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Robotics For The Streets: Open-Source Robotics for Academics</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carlotta A Berry, Alejandro Marcenido Larregola, Katie Collins and Josiah McGee (Rose-Hulman Institute of Technology, USA)</td>
<td></td>
</tr>
</tbody>
</table>

**4:30 – 6:00**

**WIP-22: Diversity and Broadening Participation #11 [WIP]**

**Room: ROSS I**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Navigating Undergraduate Engineering as Women of Color</strong></td>
</tr>
<tr>
<td></td>
<td>Malini M Josiam, Taylor Y. Johnson, Michelle C Ausman and Walter C. Lee (Virginia Tech, USA)</td>
</tr>
<tr>
<td></td>
<td><strong>Engineering and Computing Identity Development: Exploring Differences in National Origin for Latina College Students</strong></td>
</tr>
<tr>
<td></td>
<td>Sarah L Rodriguez (Virginia Tech, USA)</td>
</tr>
<tr>
<td></td>
<td><strong>A Comparison of Engineering Student Persistence Prior to and During COVID-19 Interruptions</strong></td>
</tr>
<tr>
<td></td>
<td>Syahrul Amin and Karen Rambo-Hernandez (Texas A&amp;M University, USA); Blaine Pedersen (Texas A&amp;M University, USA); Camille Burnett (PVAMU, USA); Bimal Nepal (USA); Noemi Mendoza (Texas A&amp;M University, USA)</td>
</tr>
</tbody>
</table>
### Detailed Program – Thursday, October 19th

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:30 – 6:00</td>
<td><strong>WIP-23: Ethics and Thinking &amp; Educational Level [WIP]</strong></td>
<td>ROSS II</td>
</tr>
<tr>
<td></td>
<td><strong>Raising Young Pupils and Students' Awareness Levels About the Impacts of Digital</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technologies on the Environment, Climate, Health and Well-Being Through a Challenge**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sébastien Combéfis (Computer Science and IT in Education ASBL &amp; AEI Consulting, Belgium);</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Steve Tumson (Tumson Consulting, Belgium)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Leveraging the Power of AI in Undergraduate Computer Science Education: Opportunities and</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Challenges**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yunkai Liu (Gannon University, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Senses of relationship and utopias: Unveiling ethical subjectivities in the engineering</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>culture**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sandra Milena Merchán-Rubiano (Universidad de La Salle)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Information Talent&quot; sharing program: Discussion on an assistant form of Interdisciplinary**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Information Literacy Education**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jinghan Liu (Tsinghua University, China); Lifeng Han (Tsinghua University Library, China);</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Liwei Bao (Tsinghua University, China)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>CEO as a professor: a connection perspective between theory and practice in engineering</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>programs**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frederico Pifano de Rezende (Federal Institute of Espírito Santo, USA &amp; Texas A&amp;M University,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>USA); Chris Curran (Texas A&amp;M University, USA); Afsaneh H. dEscoffier (Fiocruz, Brazil);</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marco Braga (CEFET/RJ, Brazil)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:30 – 6:00</td>
<td><strong>WIP-24: Ethics and Thinking #2 [WIP]</strong></td>
<td>REVEILLE I</td>
</tr>
<tr>
<td></td>
<td>The paradox of industrial involvement in engineering higher education**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Srinjoy Mitra (University of Edinburgh, United Kingdom (Great Britain)); Jean-Pierre Raskin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Université Catholique de Louvain, Belgium)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Distinguishing Between Ethical and Normative Behaviors in Engineering: A Delphi Study</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Athena Lin and Justin L Hess (Purdue University, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Using ChatGPT for homework: Does it feel like cheating? (WIP)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Campbell R. Bego (University of Louisville &amp; J. B. Speed School of Engineering, USA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Implementing a Praxis of Change: A Comparative Case Study on the Instruction of</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engineering Ethics and the Development of Trust**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hortense Gerardo (University of California, San Diego, USA); Raymond de Callafon and Nicholas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boechler (University of California San Diego, USA)</td>
<td></td>
</tr>
</tbody>
</table>
Detailed Program – Thursday, October 19th

Diversity, Equity, and Inclusion (DEI) Research in Engineering Education: Preliminary Results from a Scoping Literature Review
Yi Cao (1211 University City B & Virginia Tech, USA) and Homero Murzi (Virginia Tech, USA)

4:30 – 6:00
WIP-25: Mental Health & Diversity [WIP]
Room: REVEILLE II

Improving Mental Health Support in Engineering Education using Machine Learning and Eye-Tracking
Yuexin Liu (Texas A&M University, USA); Wei Lu (TEXAS A&M UNIVERSITY, USA); Amir Tofighi Zavareh (Texas A&M University, USA); Michelle Rigsby (TEXAS A&M UNIVERSITY, USA); Ben Zoghi (Texas A&M University, USA)

WIP: Faculty Perceptions of Graduate Student Mental Health: A Productivity Framing
David Feil-Seifer and Mackenzie C. Parker (University of Nevada, Reno, USA); Kiara L Steinhorst (University of Nevada, USA); Adam Kirn (University of Nevada, Reno, USA)

Using Self-Determination Theory to Examine Student Responses to Five-Minute Self-Regulation Strategies in the Engineering Classroom
Harly Ramsey and Julie Loppacher (University of Southern California, USA)

Improving Undergraduate Research Mentoring Practices: Faculty Development to Support Non-Traditional Students in Computing Research
Sarah Hug (Colorado Evaluation and Research Consulting, USA); Patricia Morreale (Kean University, USA); Heather Thiry (University of Colorado Boulder, USA)

Deficit Ideologies in Engineering Education: Unveiling Challenges and Implications
Joel Alejandro Mejia (The University of Texas at San Antonio, USA); Karina Ivette Vielma (University of Texas at San Antonio, USA)

WIP: Racialized discourses in engineering education: What can we learn from raciolinguistics to inform broadening participation in predominantly Latino/a/x engineering spaces?
Joel Alejandro Mejia and Martha Sidury Christiansen (The University of Texas at San Antonio, USA)

(Work in Progress) Mindset in the Computing Classroom and Broadening Participation: A Pilot Study
Jasmine S Batten (Florida International University, USA); Monique Ross (The Ohio State University, USA)
Detailed Program – Thursday, October 19th

4:30 – 6:00

**WIP-26: Attitudes and Perceptions & Others [WIP]**

*Room: EAGLE*

**Fairness in Predictive Learning Analytics: A Case Study in Online STEM Education**
Ali Al-Zawqari (Vrije Universiteit Brussel, Belgium); Gerd Vandersteen (Vrije Universiteit Brussel (VUB), Belgium)

**Work in progress: ChatGPT as an Assistant in Paper Writing**
Pablo Baizan, Clara Pérez, Rosario Gil and Elio Sancristobal (Spanish University for Distance Education - UNED, Spain); Felix Garcia Loro (Spanish University for Distance Education (UNED), Spain); Manuel Castro (Spanish University for Distance Education - UNED, Spain)

**A systematic review of student misconceptions about electricity and electric circuit concepts**
Alexander Skelton, Muhammad Zafar, Nathaniel Hunsu and Olanrewaju Paul Olaogun (University of Georgia, USA); Ismail A Idowu (Morgan State University, USA)

**The Development of An Instrument to Measure Engineering Faculty’s Self-Efficacy and Perceptions of Teaching Laboratory Intensive Online Courses**
Garth V Crosby (Texas A&M University, USA); Maram Alaqra (Texas A&M University, USA); Bugrahan Yalvac (Texas A&M University, USA)

**Work-in-Progress (Research Category): Using multimodal approaches to understand the attention and focus of students engaging in intuition-based online engineering learning games**
Chelsea Obade, Kimberly Cook-Chennault and Hyeon Woo Kim (Rutgers, the State University of New Jersey, USA)

**Engineering Program "Freshmen Motivation Week"**
Claudio R Brito (Science and Education Research Organization, Portugal); Melany M Ciampi (Safety, Health and Environment Research Organization & President, Portugal)

**Observations of Cheating Behaviours in Online Examinations and Tools for Mitigation**
Manuel Castro (Spanish University for Distance Education - UNED, Spain); Sathiamoorthy Manoharan (The University of Auckland, New Zealand); Ulrich Speidel, Xinfeng Ye and Jiayi Zu (University of Auckland, New Zealand)

6:00 - 9:00

**DWN-B: Social Event, Downtown Bryan**

*Room: Downtown Bryan*
Detailed Program – Friday, October 20th

8:00 - 9:15  
**Plen-2: Keynote Presentation, Gary R Bertoline**  
*Room: A&M Hotel Century Ballroom*

**Engineering the Inclusive Mindset for the Future: A Blueprint for Systemic Change in Undergraduate Engineering & Engineering Technology Education**

Gary R Bertoline, Ph.D (Purdue University, USA)

**Bio:** Dr. Gary R. Bertoline is a Distinguished Professor of Engineering Technology and Computer & Information Technology at Purdue University. He earned his Ph.D. at The Ohio State University and was on the faculty in the College of Engineering for three years before coming to Purdue University in 1990.

As Dean at Purdue, he led the development of the Polytechnic Institute at Purdue, a significant effort to transform students' learning experience to better prepare graduates for life and work in the digital age by adopting student-centered, high-impact educational practices. Gary was the visionary co-leader for the Purdue Polytechnic High Schools in Indianapolis and South Bend, IN, with more schools planned.

He has authored and co-authored seven computer-aided design and engineering design graphics textbooks, with one, Fundamentals of 3D Solid Modeling and Graphics Communications, soon to be in its 8th edition.

Gary is PI for an NSF grant in collaboration with the National Academy of Engineering (NAE) and the American Society of Engineering Education (ASEE). This grant will develop a curriculum framework for an innovative, adaptive, robust, diverse, and inclusive engineering and engineering technology education model relevant to the 21st century.

**Abstract:** The world's challenges today demand systemic change in engineering education and a growth mindset of the engineer. The rich history of the nation's engineers' extraordinary accomplishments brings hope that today's challenges to humanity can be addressed with systemic changes in engineering education based on a growth mindset in the classroom. This approach builds on the scientific and analytical mindset established by the Grinter Report and modernizes it to include known effective student-centered success practices.

With the threefold framework of 1.) challenges facing humanity, 2.) increasing the diversity of the engineering profession, and 3.) developing a student-centric mindset in the preparation of engineers, the American Society for Engineering Education (ASEE) and the National Academy of Engineering (NAE), through the support of the National Science Foundation (NSF) have undertaken the task of reviewing the current state of engineering and engineering technology education to make recommendations that will advance the discipline of engineering education. A diverse group of people interested and dedicated to improving engineering education came together to define a Call to Action to imagine and make recommendations for a new future of engineering education. This multi-year effort will guide engineering and engineering technology faculty and leaders through specific recommendations for changing curricula, pedagogy, and mindsets. The preliminary findings of this Call to Action will be presented.
## Detailed Program – Friday, October 20th

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:15 – 10:45 AM</td>
<td><strong>FIE’24 Planning Session (closed meeting)</strong></td>
<td>Hullabaloo</td>
</tr>
<tr>
<td></td>
<td>Multi-Modal Approach - Why, What, When, and How?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Idalis Villanueva Alarcón (University of Florida, USA); Saira Anwar (Texas A&amp;M University, USA); Zahra Atiq (The Ohio State University, USA)</td>
<td></td>
</tr>
<tr>
<td>9:15 – 10:45</td>
<td><strong>PNL-2: [PANEL] Zoom a WISE Woman: Becoming a STEM Expert!</strong></td>
<td>CORPS I &amp; II</td>
</tr>
<tr>
<td></td>
<td>Zoom a WISE Woman: Becoming a STEM Expert!</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rachelle Pedersen, Iliana De La Cruz, Sarah Poor, Natalie Coleman, Haley Moyer and Marion Nachon (Texas A&amp;M University, USA)</td>
<td></td>
</tr>
<tr>
<td>9:15 – 10:45</td>
<td><strong>PNL-3: [PANEL] Toward Scalable Competency-Based Computing Education</strong></td>
<td>REVEILLE I &amp; II</td>
</tr>
<tr>
<td></td>
<td>Toward Scalable Competency-Based Computing Education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alison Clear (EIT, New Zealand); John Impagliazzo (Hofstra University, USA); Judith Gal-Ezer (Open University, Israel); Marisa Exter (Purdue University, USA)</td>
<td></td>
</tr>
<tr>
<td>9:15 – 10:45</td>
<td><strong>PNL-4: [PANEL] Faculty Leadership</strong></td>
<td>MSC 2406 A &amp; B</td>
</tr>
<tr>
<td></td>
<td>Panel: Faculty Leadership</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Huihui H Wang (National Science Foundation, USA); Lina Karam (Arizona State University, USA); Georges Zissis (Université de Toulouse, France); Jianchu Yao (East Carolina University, USA); Jill Nelson (George Mason University, USA); Minho Jo (Korea University, Korea (South)); Rafal Sliz (University of Oulu, Finland); Michele Nogueira (Federal University of Minas Gerais, Brazil); Steve E Watkins (Missouri University of Science and Technology, USA)</td>
<td></td>
</tr>
<tr>
<td>10:45 - 11:15</td>
<td><strong>B-2: Friday Morning Break</strong></td>
<td>Second Floor Foyer &amp; MSC 2401</td>
</tr>
</tbody>
</table>
### Detailed Program – Friday, October 20th

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:15 – 12:45</td>
<td><strong>PP-12: Pedagogical and Instructional Approaches #7</strong></td>
<td>MSC 2406 A</td>
</tr>
</tbody>
</table>

  - Glen Hordemann (Texas A&M University & Texas A&M Embodied Interaction Lab, USA); Francis Quek and Larry Powell (Texas A&M University, USA)

- **Measuring Computing Students' Perceptions of Social Presence and Engagement in Synchronous Remote v. In-Person Classes**
  - Noah Q Cowit, Christopher Lynnly Hovey and Lecia Barker (University of Colorado Boulder, USA)

- **Beyond Courses: Towards Supporting Goal-Oriented Learning in MOOC Platforms**
  - Fareedah E Alsaad (King Abdul Aziz University, Saudi Arabia); Abdussalam Alawini (University of Illinois at Urbana-Champaign, USA)

- **Granular or Long: Influence of the Content Structure on Student Interaction with Learning Materials**
  - Jacek Marciniak, Andrzej Wójtowicz, Barbara Kołodziejczak and Marcin Szczepański (Adam Mickiewicz University, Poland); Dorota Marciniak (SWPS University, Poland); Anna Stachowiak (Adam Mickiewicz University, Poland)

- **Towards the future of engineering education: Synchronous evaluation of skills between distant universities in a Global Shared Learning Classroom**
  - Rebeca García-García and Olga Patricia Vazquez-Villegas (Tecnologico de Monterrey, Mexico); Maria Ileana Ruiz Cantisani (Tecnológico de Monterrey, Mexico); Vianney Lara-Prieto, Patricia Caratozzolo, Gisselle Morales Veloquio, Luz Patricia Montaño Salinas and Jorge Membrillo-Hernández (Tecnologico de Monterrey, Mexico)

- **A Systematic Review of Perceptions Regarding Educational Video Games Held by Students, Administrators, Teachers, and Parents**
  - Yanwen Chen, Anthony D Jones, Emma Ko, Sherry M Nguyen, Lenny Tanui, Addison Zipter and Andre Thomas (Texas A&M University & LIVE Lab, USA); Michael S Rugh (Texas A&M University & LIVE Lab, USA)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:15 – 12:45</td>
<td><strong>PP-13: Pedagogical and Instructional Approaches #8</strong></td>
<td>MSC 2406 B</td>
</tr>
</tbody>
</table>

- **Successful Implementation of Education Technology in Schools and Colleges**
  - Sarah Gibson and Catherine Carroll (CooperGibson Research, United Kingdom (Great Britain)); Colin Brown (Five Tribes Ltd, United Kingdom (Great Britain))

- **Comparison of Student Learning Outcomes Among SQL Problem-Solving Patterns**
  - Sophia Yang, Geoffrey L Herman and Abdussalam Alawini (University of Illinois at Urbana-Champaign, USA)
Detailed Program – Friday, October 20\textsuperscript{th}

**AR-Classroom: Augmented Reality Technology for Learning 3D Spatial Transformations and Their Matrix Representation**  
Shu-Hao Yeh, Chengyuan Qian, Dezhen Song, Samantha D. Aguilar, Heather Burte and Philip Yasskin (Texas A&M University, USA); Ziad Ashour (King Fahd University of Petroleum and Minerals, Saudi Arabia); Zohreh Shaghaghian (PassiveLogic, USA); Uttamasha Monjoree (Texas A&M University, USA); Wei Yan (Texas A&M University, USA)

**AR-Classroom: Usability of AR educational technology for learning rotations using three-dimensional matrix algebra**  
Samantha D. Aguilar, Heather Burte, Philip Yasskin, Jeffrey Liew, Shu-Hao Yeh, Chengyuan Qian and Dezhen Song (Texas A&M University, USA); Uttamasha Monjoree (Texas A&M University, USA); Wei Yan (Texas A&M University, USA)

**Virtual Hiring Managers: Student Perceptions and Agent Preferences**  
Veon Brewster and Stephanie J. Lunn (Florida International University, USA)

**Motivating the New Generation: Using Flipped Classroom and ARCS Model to Enhance Block-Based Programming Education**  
Choi Wan-Chong (Macao Polytechnic University, Macao); António José Mendes (University of Coimbra & CISUC, Dep. of Informatics Engineering, Portugal); Huey Lei (Caritas Institute of Higher Education, Hong Kong)


\begin{tabular}{|l|}
\hline
11:15 – 12:45 \hline
\end{tabular}

**Room: MSC 2405**

**Health Tycoon: An Educational Simulation Game on Positive Habits**  
Matheus H. D. Cirillo (University of Sao Paulo, Brazil); Gustavo M S C Ferreira (University of São Paulo, Brazil); Michel Hecker Faria (Universidade de São Paulo, Brazil); Alexandre Ponce de Oliveira (Faculdade de Tecnologia de Lins & Universidade de São Paulo, Brazil); Carla Roberta O. Carvalho (University of São Paulo, Brazil); Paulo S. Souza (University of Sao Paulo, Brazil)

**Enzigame: An educational game about enzymes and metabolism**  
Gustavo M S C Ferreira (University of São Paulo, Brazil); Matheus H. D. Cirillo (University of Sao Paulo, Brazil); Michel Hecker Faria (Universidade de São Paulo, Brazil); Paulo S. Souza (University of Sao Paulo, Brazil); Alexandre Ponce de Oliveira (Faculdade de Tecnologia de Lins & Universidade de São Paulo, Brazil); Carla Roberta O. Carvalho (University of São Paulo, Brazil)

**Promoting Entrepreneurial Mindset and Diversity in Power Engineering Class through Case Studies**  
Khalid Al-Olimat (Ohio Northern University, USA)

**Conclusions of an Action Research Intervention for Activating Large Cohorts in Academic Courses**  
Matthias Haack and Jutta Mägdefrau (University of Passau, Germany)
Detailed Program – Friday, October 20th

Online Prediction to Facilitate a Flipped and Adaptive Classroom
Qiong Cheng (University of North Carolina at Charlotte, USA)

Metabuleiro: a digital board game about the human body and a healthy diet
Gustavo M S C Ferreira (University of São Paulo, Brazil); Matheus H. D. Cirillo (University of Sao Paulo, Brazil); Michel Hecker Faria (Universidade de São Paulo, Brazil); Paulo S. Souza (University of Sao Paulo, Brazil); Alexandre Ponce de Oliveira (Faculdade de Tecnologia de Lins & Universidade de São Paulo, Brazil); Carla Roberta O. Carvalho (University of São Paulo, Brazil)

11:15 – 12:45
PP-15: Diversity and Broadening Participation #4
Room: REVEILLE I & II

Noncognitive and Affective Attributes of Caregivers Enrolled in Engineering and Computing Programs
Sanga Kim (The University of Texas at El Paso, USA); Lisa C. Kaczmarczyk (Independent Consultant, USA); Jessica Rivera and Ann Gates (University of Texas at El Paso, USA)

Digging for Bedrock: Grounded Strategies for Broadening Participation in Engineering
Gregory Triplett, Jr (Saint Louis University, USA); John Leonard and Rachel Wasilewski (Virginia Commonwealth University, USA)

Widening Access to Higher Education through Degree-level Apprenticeships in Software Engineering
Matthew Barr, Oana Andrei and Maria Kallia (University of Glasgow, United Kingdom (Great Britain))

Perceived barriers and costs associated with participation in student innovation competitions
Sadan Kulturel-Konak, Ada Leung and Abdullah Konak (Penn State Berks, USA)

Mentoring Economically Disadvantaged Computing Students with a Growth Mindset: Embracing our Own Growth Mindset by Learning from First Faculty Perspectives of a Novel Endeavor
Sharon Mason (Rochester Institute of Technology, USA); Kimberly Fluet (University of Rochester, USA)

Theatre in Engineering Classes: An Interdisciplinary Approach to Address Bias in Student Engineering Teams
Paul Kritschgau (unkown, USA); Irene Alby (West Virginia University, USA); Rebecca Brown Adelman (Affinity Arts Consulting, USA); Robin Hensel, Kristin Brewerst and Susie Huggins (West Virginia University, USA); Karen Rambo-Hernandez (Texas A&M University, USA)
### Detailed Program – Friday, October 20th

**11:15 – 12:45**

**PP-16: Professional Development #3**

*Room: MSC 2404*

<table>
<thead>
<tr>
<th>Presentation Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluating competences on first year course in three years: external effects on creative tension</td>
<td>Niko Myller, Jussi Kantola and Carolina Islas Sedano (University of Turku, Finland)</td>
</tr>
<tr>
<td>Integrating active methodologies in the R, D&amp;I projects to improve student's skills: A case study</td>
<td>Diego Sales (Federal University of Amazonas &amp; Institute Federal of Amazon, Brazil); Jose Pinheiro Queiroz Neto (IFAM, Brazil); Gilbert Martins (Instituto Federal de Educação, Ciência e Tecnologia Do Amazonas, Brazil); Cleber Figueira (SMART, Brazil)</td>
</tr>
<tr>
<td>Academic Support 360 Framework in Higher Education</td>
<td>Emer Thornbury, Frances Sheridan and Lisa Murphy (National College of Ireland, Ireland); Pramod Pathak (Technological University of Dublin, Ireland); Cristina H Muntean and Paul Stynes (National College of Ireland, Ireland)</td>
</tr>
<tr>
<td>A Matrix Taxonomy of Knowledge, Skills, And Abilities (KSA) shaping 2030 Labor Market</td>
<td>Patricia Caratozzolo, José Daniel Azofeifa, Luis Alberto Mejía-Manzano and Valentina Rueda-Castro (Tecnologico de Monterrey, Mexico); Julieta Noguez (Tecnologico de Monterrey &amp; Escuela de Ingeniería y Ciencias, Mexico); Alejandra J. Magana and Bedrich Benes (Purdue University, USA)</td>
</tr>
<tr>
<td>TestMate: programming teaching support tool</td>
<td>Isaac Souza Elgrably, Pedro Henrique Alves Luz and João Víctor Silva Kiluchi (Cesupa, Brazil)</td>
</tr>
<tr>
<td>A Quantitative Study of Youth Employees’ Use of an Informal Chatting Tool at a Workforce Training Program</td>
<td>Foad Hamidi and William Easley (UMBC, USA); Amy Hurst (NYU, USA)</td>
</tr>
</tbody>
</table>

**11:15 – 12:45**

**PP-17: Curriculum and Course Development #5**

*Room: CORPS I & II*

<table>
<thead>
<tr>
<th>Presentation Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem-KIT: An interdisciplinary approach to learning physics and computer science</td>
<td>Matilde Gugole (University of Trento); Francesca Fiore and Tommaso Rosi (University of Trento, Italy); Giuliano Zendri (Level Up, Italy); Alberto Montresor (University of Trento, Italy)</td>
</tr>
<tr>
<td>On multidisciplinary education practices inspired by loosely-coupled architectures</td>
<td>Andrei Lobov (Norwegian University of Science and Technology, Norway)</td>
</tr>
</tbody>
</table>
Detailed Program – Friday, October 20th

Why Re-focus on IoT in education? Evidence of the Paradigm Project
Theodora K. Kouvara and Anastasios Fanariotis (Hellenic Open University, Greece); Vassilis Fotopoulos (Hellenic Open University & Digital Systems & Media Computing Laboratory, Greece); Christoforos Karachristos and Theofanis G. Orphanoudakis (Hellenic Open University, Greece)

An approach to intelligent support in designing educational programs using X-Matrices and a special domain-specific language
Alexey Dukhanov, Artem Kuzmin Alekseyevich and Semen Kraev (ITMO University, Russia)

Multidisciplinary Hackathons: Towards Developing Practical Software Engineering Skills
Mojgan Moshirpour, Tariq Al Shoura and Linda Duffett-Leger (University of Calgary, Canada); Mohammad Moshirpour (University of California, Irvine, USA)

11:15 – 12:45
PP-18: Education Level #3
Room: ROSS I & II

Enhanced 3D visuo-haptic simulators to understand the nature of friction forces
Luis J. Neri (Tecnologico de Monterrey & Escuela de Ingeniería y Ciencias, Mexico); Víctor Robledo-Rella (Tecnologico de Monterrey, Mexico); Julieta Noguez (Tecnologico de Monterrey & Escuela de Ingeniería y Ciencias, Mexico); Rosa M.G. García-Castelán (Tecnologico de Monterrey, Mexico); Andres Gonzalez-Nucamendi (Tecnologico de Monterrey, Escuela de Diseño Ingeniería y Arquitectura, Mexico)

Research Experience for Undergraduates (REU) on Construction Decision Making
Tulio Sulbaran (The University of Texas at San Antonio, USA)

Postdoctoral Mentorship Competency Assessment for Engineering and Computer Sciences
Matthew Bahnson (Pennsylvania State University, USA); Monique Ross (The Ohio State University, USA); Catherine Berdanier (Pennsylvania State University, USA)

A Lightweight Web Tool to Support Feedback in Introductory Programming Practices in Brazilian Undergraduate Disciplines
Lucas S. Candiotto (Federal University of Paraná, Brazil); Marcos V. O. de Assis (Federal University of Parana, Brazil); Marcos A. Schreiner (Federal University of Paraná, Brazil); Maria Lydia Fioravanti (University of São Paulo, Brazil & Universidad Politécnica de Madrid, Spain); Ellen Barbosa (University of São Paulo, Brazil); Anderson S. Marcolino (Federal University of Paraná, Brazil)

11:15 – 12:45
PP-19: Computing #4
Room: HULLABALOO

Literature Adventures with MEM in LIWC
Kristin L. Schaefer, Jerrod A Henderson and Jorge Rosales (University of Houston, USA)
Detailed Program – Friday, October 20th

**The Proposal of a Dashboard for Analysis and Visualization of Educational Data of Intelligent Tutoring Systems**
Matheus F Menezes, José Francisco Magalhães, Netto and Arcanjo Lopes (Federal University of Amazonas, Brazil); Ronilson C Silva (Universidade Federal do Amazonas & UFAM, Brazil)

**Predicting Students’ Software Engineering Class Performance with Machine Learning and Pre-class GitHub Metrics**
Jialin Cui and Fangtong Zhou (North Carolina State University, USA); Runqiu Zhang (University of Virginia, USA); Ruochi Li (Northeastern University, USA); Chengyuan Liu and Ed Gehringer (North Carolina State University, USA)

**A Serious Game for Teaching Computer Networks: A Comparison between Remote and In-Person Scenarios**
Windson Viana (Federal University of Ceara, Brazil); Ricardo Rodrigues Pereira (Universidade Federal do Ceará, Brazil)

**Engaging Novice Programers: A Literature Review of the Effect of Code Critiquers on Programming Self-efficacy**
Mary E Benjamin, Michelle Edith Jarvie-Eggart, PE and Leo C. Ureel II (Michigan Technological University, USA); Laura Brown (Michigan Tech, USA); Jon Sticklen (Michigan Technological University, USA)

**Gamification project to receive continuous feedback in the context of the evolution of public service for lawyers**
Ricardo Cordeiro G. Sant’Ana van Erven (University of Brasília (UnB), Brazil); Demétrius de Almeida Jubé and Helen Reis Santos (University of Brasilia, Brazil); Sergio A. A. Freitas (University of Brasilia, Brazil); Edna Dias Canedo, Sra (University of Brasilia & UNB, Brazil)

11:15 – 12:45
**PP-20: Assessment #1**
*Room: LEADERSHIP LAB*

**Scaffolding the Blended Learning Experience by Integrating a Weekly Assessment into an Introductory Power Systems Course**
Sangit Sasidhar (National University of Singapore, Singapore)

**Beyond Question Shuffling: Randomization techniques in programming assessment**
Henry Hickman, Paul McKeown and Tim Bell (University of Canterbury, New Zealand)

**Evaluating a Pass/Fail Grading Model in First Year Undergraduate Computing**
Mark Zarb, Roger McDermott, Kyle Martin, Tiffany Young and Jess McGowan (Robert Gordon University, United Kingdom (Great Britain))

**Towards Automated Assessment of High School Programming**
Henry Hickman and Tim Bell (University of Canterbury, New Zealand)
### Detailed Program – Friday, October 20th

**A Review of Spatial Assessments for Science, Technology Engineering, and Mathematics Education Research: A Sample from the Northwestern SILC Website**  
So Yoon Yoon, Hannah Hitchings and Mark J Dsilva (University of Cincinnati, USA)

**Staying Consistent: Discipline-Specific Language Used in a Well-known AP CS A Curriculum**  
Jason L Weber and Jennifer Parham-Mocello (Oregon State University, USA)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:15 – 12:45</td>
<td>PP-21: K12 STEM Education #4</td>
<td>OAK</td>
</tr>
</tbody>
</table>

**Constraints in PK-8 STEM Classrooms: A Mixed Methods Study**  
Natasha L Wilkerson, Daniel J. De Jesús and Kelli Adam (Texas A&M University, USA)

**Spatial Visualization in Informal Learning**  
Sandra B Nite and Niyazi Erdogan (Texas A&M University, USA); Ali Bicer (University of Wyoming, USA); Kimberly Ann Currens (Texas A&M University, USA); Seonhu Lee (Allen Academy, USA)

**Spatial Reasoning Development in the K12 Environment**  
Sandra B Nite, Niyazi Erdogan and Trenton Gray (Texas A&M University, USA); Seonhu Lee (Allen Academy, USA)

**Computer Science (CS) Day for Middle School Students**  
Trevor D Veron, Teresa F Iles, Jiangjiang Liu and Aetesam Ali Khan Ashar (Lamar University, USA)

**From Classroom to Cosmos: The Impact of Space Teams Academy on Engineering Education**  
Fernando S Arias and Elise A Koock (Texas A&M University, USA); Gregory E Chamitoff (Texas A&M University & SimDynamX LLC, USA)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:15 – 12:45</td>
<td>PP-22: Ethics and Thinking #1</td>
<td>TRADITIONS</td>
</tr>
</tbody>
</table>

**Identifying Critical Incidents Related to Ethics Among Early-Career Engineers**  
Lazlo K. Stepback and Carla B. Zoltowski (Purdue University, USA); Stephanie A. Claussen (San Francisco State University, USA); Brent Jesiek (Purdue University, USA)

**Leadership Identity Development of Computer Science Undergraduates for a Diverse and Global World**  
Mariana Alvidrez (New Mexico State University, USA); Elsa Villa (The University of Texas at El Paso, USA); Jessica Rivera (University of Texas at El Paso, USA)

**On the Challenges and Opportunities of Using ChatGPT in Academia**  
Mohamed Morsy (Texas A&M University Texarkana, USA); Abdallah Farraj (Texas A&M University System, USA); David Reavis (Texas A&M University-Texarkana, USA)
Detailed Program – Friday, October 20th

The role of peer dialogue as disruptor in critical ethical analysis for computing students
Andrew Ciminski and Charles Wallace (Michigan Technological University, USA)

Teaching Multidimensional Ethical Decision-Making through a Role-Play Case Study
Shruti Mehta, Ashish Hingle and Aditya Johri (George Mason University, USA)

What do Biomedical Engineering Faculty Talk About When They Talk About Ethics?
Nicholas D Fila (Iowa State University, USA); Justin L Hess and Andrew O. Brightman (Purdue University, USA)

12:45 - 2:15
L-2: Friday Lunch and Awards Ceremony
Room: A&M Hotel Century Ballroom, MSC 2400

2:15 - 3:45
PP-23: Pedagogical and Instructional Approaches #19
Room: MSC 2406 A

Impacts of Course Culture on Student Creativity Development in Engineering Course Projects
Haifeng Wang (Pennsylvania State University & Pennsylvania State University New Kensington, USA); Shirley Campbell (Pennsylvania State University, USA)

Innovations in an undergraduate laboratory to increase engagement
Amir Saeidi (University of California, Davis, USA); James C Earthman (UC Irvine, USA)

Exploring the differences in student perceptions and performances using microlearning instruction and video lectures: A comparison study
Rajagopal Sankaranarayanan (The University of Texas at Austin, USA); Shamima Mithun (IUPUI, USA)

An Approach to Facilitate Students’ Work on a Graduate Thesis Based on Ontologies and Faceted Classification
Alexey Dukhanov and Alexandra Klimova (ITMO University, Russia); Tamara Chistyakova (St Petersburg State Institute of Technology - Technical University, Russia)

A taxonomy to assist TAs in providing adaptive feedback to novice programmers
Hemilis Rocha, Sra (UFPE - Universidade Federal de Pernambuco & Centro de Informática, Brazil); Patricia Tedesco (CIN- UFPE & Center for Informatics - Federal University of Pernambuco, Brazil); Evandro Costa (UFAL-Universidade Federal de Alagoas, Brazil)

2:15 – 3:45
PP-24: Pedagogical and Instructional Approaches #20
Room: MSC 2406 B

Learning to Teach: A Guide to Using Learning Theories in Computer Science Education
Edison Ishikawa (University of Brasília & Asa Norte, Brazil); Hanniel Fernando Lopes Saldanha, Hugo Hiroshi Silva Tutida and Maria de Fátima Ramos Brandão (University of Brasília, Brazil); Maristela Holanda (Texas A&M, USA)
Detailed Program – Friday, October 20th

**Improving Student Success and Retention in CS1 through Self-Selection into Experience-Based Groups**
April R Crockett, Gerald Gannod and Moumita Kamal (Tennessee Technological University, USA)

**Scrum in the Classroom: An Implementation Guide**
Sarah A Reynolds, Alexis Caldwell, Tyler Procko and Omar Ochoa (Embry-Riddle Aeronautical University, USA)

**Assessing the Impact of Specifications Grading on a Data Visualization course**
Alark Joshi (University of San Francisco, USA)

**Generating Multiple Choice Questions for Computing Courses using Large Language Models**
Andrew Tran, Kenneth Angelikas, Egi Rama and Chiku Okechukwu (Temple University, USA); David H. Smith IV (University of Illinois, USA); Stephen MacNeil (Temple University, USA)

2:15 – 3:45
**PP-25: Mental Health #1**
*Room: MSC 2405*

**EEG Spectral Analysis for Inattention Detection in Academic Domain**
Nasrin Dehbozorgi and Sreekanth Gopi (Kennesaw State University, USA)

**Supporting Students' Time Management Through Deadline Flexibility and Responsive Instructor Support**
Atousa Hajshirmohammadi (Simon Fraser University, Canada)

**Engineering student mental health and help seeking - Analysis of national data from the Healthy Minds Study**
Matthew Whitwer, Sarah Wilson and Joseph H. Hammer (University of Kentucky, USA)

**What Contributes to Engineering Undergraduates' Mental Health and Wellbeing? Engineering Faculty Perceptions through an Exploratory Study**
Muhammad Asghar and Angela Minichiello (Utah State University, USA); Assad Iqbal (The Ohio State University, USA)

**Engineering Doctoral Students' Interpretations of Stress and Mental Health Experiences in Graduate Education**
Mackenzie C. Parker (University of Nevada, Reno, USA); Kiara L Steinhorst (University of Nevada, USA); Adam Kirn and David Feil-Seifer (University of Nevada, Reno, USA)

**So much time, so little reward: Structural factors that impact student experiences in a computer architecture course**
Sage Maul and Kevin J Kaufman-Ortiz (Purdue University, USA); Héctor E Rodríguez-Simmonds (Boston College, USA); Natascha T Buswell (University of California, Irvine, USA)
Detailed Program – Friday, October 20th

2:15 – 3:45
PP-26: Diversity and Broadening Participation #9
Room: ROSS I

Exploring Student Engagement, Confidence, and Usefulness for Female Students in CS Class at High School Using Machine Learning
Sultanah Abdullah A Albakri (University of Glasgow, United Kingdom (Great Britain) & University of Hail, Saudi Arabia); Mireilla Bikanga Ada and Alistair Morrison (University of Glasgow, United Kingdom (Great Britain))

Expanding Pathways for Hispanic Students to Enter and Succeed in Computing Graduate Studies
Jessica Rivera and Ann Gates (University of Texas at El Paso, USA); Elsa Villa (The University of Texas at El Paso, USA); Patricia Morreale (Kean University, USA); Lee (University at Buffalo, USA)

Integrating history and engineering to examine foundational assumptions
Lizbeth Thompson (Cal Poly, San Luis Obispo, USA)

2:15 – 3:45
PP-27: Diversity and Broadening Participation #10
Room: ROSS II

La familia y los amigos: Understanding how social and familial capital impact Latinx engineering students
A. Lili Castillo and Dina Verdin (Arizona State University, USA)

Investigating Women's Learning Experiences in Computing through the Lens of Schlossberg's Transition Theory
Jia Zhu (Florida International University, USA); Monique Ross (The Ohio State University, USA); Jasmine S Batten (Florida International University, USA)

How the Hidden Curriculum Reveals the Enculturation Experience of Underrepresented Students in Engineering
Kylee N Shiekh and Dean Nieusma (Colorado School of Mines, USA); Qin Zhu (Virginia Tech, USA); Stephen Rea (Anti-Defamation League, USA)

Exploring the Significance of Internship Experiences for the Career Development of Racially Minoritized Undergraduate Engineering Students
Sophia Vicente, Taylor Y. Johnson, Taylor Lightner and Walter C. Lee (Virginia Tech, USA); Dina Verdin (Arizona State University, USA)

Assessing the self-efficacy level of Freshmen on Ethical Research and Practices in Engineering
Bimal Nepal and Michael Johnson (USA); Amarnath Banerjee, Ankita Varshney and Glen Miller (TEXAS A&M UNIVERSITY, USA)
Detailed Program – Friday, October 20\textsuperscript{th}

**Latinx Students' Motivation for Graduate Education and Engineering Academia**  
Noemi Mendoza (Texas A&M, USA); Samuel Merriweather, Vincent Guerrero, Daniella Olguin and Mark Solis (TEXAS A&M UNIVERSITY, USA)

| 2:15 – 3:45 | **PP-28: Curriculum and Course Development #10**  
| Room: CORPS I |

Diversified teaching methods of hardware experiment  
Yuchao Gao, Ninghan Zheng, ShanShan Li and Chengbin Quan (Tsinghua University, China)

Global Applied Industrial Management Education: Experiences from a Professional Graduate Program  
Bharani Nagarathnam (Texas A&M University, USA); Kourtney Gruner (Texas A&M University, USA)

Course-Based Multidisciplinary Undergraduate Research Outcomes Analysis & Assessment  
Amar Khoukhi (York College CUNY, USA)

Using the Technology Acceptance Model to Understand Intention to Adopt a CS-based Curriculum  
Jennifer Parham-Mocello and Ayushi Gupta (Oregon State University, USA)

Pilot Course in Data Visualization with a Multidisciplinary Approach: Technology+ Agricultural Engineering  
Vetria L Byrd, Dharmendra Saraswat and Aanis Ahmad (Purdue University, USA)

Expanding Remote Student Learning - Internet of Things Applications and Exercises  
David L. Hicks and Lifford McLauchlan (Texas A&M University-Kingsville, USA); Mehrube Mehrubeoglu (Texas A&M University-Corpus Christi, USA); Hemanth Bhimavarpulu (Texas A&M University-Kingsville, USA)

EdGUIDE - Aligning Content, Assessment, and Pedagogy Using Interactive Technology Environment  
Syeda Fizza Ali (Texas A&M, USA); Daniel Bang (USA); Umer Farooq (Texas A&M University, USA); Swetha Nittala ( & Stanford University, USA); Saira Anwar (Texas A&M University, USA)

| 2:15 – 3:45 | **PP-29: Curriculum and Course Development #11**  
| Room: CORPS II |

Mapping learning objectives of project-based undergraduate software engineering courses to CC2020 competency model  
Ahmad D Suleiman, Daqing Hou, Yu Liu, Jan DeWaters and Mary M Small (Clarkson University, USA); Juliana G de Souza (Virginia Commonwealth University, USA); David Shepherd (Louisiana State University, USA)
Detailed Program – Friday, October 20th

Professional IT Staff Use These Tools. Why Shouldn't We? Leveraging vSphere, vCenter, ESXi, and PowerCLI to Deploy Student "Corporate" Networks in a Foundational Cyber Security Engineering Course
Julie A. Rursch and Megan K Ryan (Iowa State University, USA)

Student interaction with a virtual learning environment: An empirical study of online engagement behaviours during and since the time of COVID-19
Pamela Johnston, Carlos Francisco Moreno-Garcia and Mark Zarb (Robert Gordon University, United Kingdom (Great Britain))

Using new AI-driven techniques to simplify serious games authoring
Ivan Perez-Colado (Universidad Complutense de Madrid, Spain); Victor Perez-Colado (Nord University, Norway); Antonio Calvo-Morata, Ruben SantaCruz-Piriz and Baltasar Fernandez-Manjon (Universidad Complutense de Madrid, Spain)

2:15 – 3:45
PP-30: Attitudes and Perceptions #6
Room: MSC 2404

An Inexpensive Alternative to Materials Lab Turnkey Expensive Systems: A Less is More Story!
Shadi Balawi (Texas A&M University, USA); Arun Srinivasa and Naveen Thomas (Texas A&M University, USA)

ERPLab: Remote Laboratory for Teaching Robotics and Programming
Ronilson C Silva (Universidade Federal do Amazonas & UFAM, Brazil); José Francisco Magalhães, Netto, Arcanjo Lopes and Matheus F Menezes (Federal University of Amazonas, Brazil)

Next-generation engineering: what are the types of real-world problems that our students want to solve?
Matilde Sánchez-Peña, Anne M McAlister and Jasmine Epps (University at Buffalo, USA)

Bridging Conventional Admissions Metrics and Undergraduate Engineering Student Non-Cognitive and Affective Factors
Trevor Franklin and Allison Godwin (Cornell University, USA); Edward Berger (Purdue University, USA)

An audience response system for monitoring classroom emotional climate in elementary school
Liljana Pushkar and Ana Sović (University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia)

Analyzing aspects of gamification in the manifestation of gaming the system behavior
Hemilis Rocha, Sra (UFPE - Universidade Federal de Pernambuco & Centro de Informática, Brazil); Patricia Tedesco (CIN- UFPE & Center for Informatics - Federal University of Pernambuco, Brazil); Evandro Costa (UFAL-Universidade Federal de Alagoas, Brazil)
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:15 – 3:45</td>
<td>PP-31: Computing #8</td>
<td>HULLABALOO</td>
<td>A Tool for Teaching and Learning of Design Space Exploration on Processor Architectures</td>
<td>Erick Rocha Amorim (Universidade Federal Do Mato Grosso Do Sul &amp; Agetic, Brazil); Ricardo Santos and Liana Dessandre Duenha (Federal University of Mato Grosso do Sul, Brazil)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Study on Computer Science Undergraduate Students Dropout at University of Brasilia</td>
<td>Mathews Noronha Silveira Lisboa (University of Brasilia, Brazil); Juliana Betini Fachini Gomes (University of Brasilia, Brazil); Maristela Holanda (Texas A&amp;M, USA); Carla Koike (UnB, Brazil); Maria Teresa Leão Costa (Universidade de Brasilia, Brazil)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Digital Twinning and Remote Engineering for Immersive Embedded Systems Education</td>
<td>Rania Hussein, Matthew Guo and Pedro Amarante (University of Washington, USA); Luis Rodriguez-Gil and Pablo Orduña (LabsLand, Spain)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Challenging the Confirmation Bias: Using ChatGPT as a Virtual Peer for Peer Instruction in Computer Programming Education</td>
<td>Otavio Santos (Universidade Federal do Espírito Santo &amp; Faculdades Integradas Espírito-Santenses, Brazil); Davidson Cury (UFES- Universidade Federal do Espírito Santo, Brazil)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clusters of Solvers’ Behavioral Patterns Based on Analysis of the Programming Process</td>
<td>Heidi Meier and Marina Lepp (University of Tartu, Estonia)</td>
</tr>
<tr>
<td>2:15 – 3:45</td>
<td>PP-32: Assessment #5</td>
<td>LEADERSHIP LAB</td>
<td>Affective Computing in Software Engineering: a Topic-Based SER Approach on Collaborative Discussions</td>
<td>Nasrin Dehbozorgi and Mourya Teja Kunuku (Kennesaw State University, USA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Learning Analytics to support education for all: learning from the past</td>
<td>Marcos Gabriel Gelorme Silveira (Universidade de São Paulo, Brazil); Leônidas O Brandão (University of São Paulo, Brazil); Anarosa A. F. Brandão (Universidade de São Paulo &amp; Escola Politécnica, Brazil)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Authentic assessment design for meeting the challenges of Generative Artificial Intelligence</td>
<td>Masood Khan, Yu M Dong and Nasrin Afsarimanesh (Curtin University, Australia)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Assessing Student Learning Across Various Database Query Languages</td>
<td>Zepei Li, Sophia Yang, Kathryn Cunningham and Abdussalam Alawini (University of Illinois at Urbana-Champaign, USA)</td>
</tr>
</tbody>
</table>
Catching Imagination: Enabling children to capture imaginative tabletop play to support storytelling and writing
Ting Liu, Larry Powell and Francis Quek (Texas A&M University, USA)

On Neurodevelopmental Disorder based on Brain Computer Interface for Enhancing the Learning Process
Nuraini Jamil, Omar Samir Alawa, Saad Mohammed Manar, Saeed Alawi Alaidarous, Abdulrahman Saeed Adam and Shehab Adel Eldemerdash (United Arab Emirates University, United Arab Emirates); Abdelkader Nasreddine Belkacem (United Arabs Emirates University, United Arab Emirates)

Didactic Resources for the Visually Impaired: a systematic review of the literature
Derlain M Lemos (Universidade Federal do Rio Grande - FURG, Brazil); Regina Barwaldt (Federal University of Rio Grande (FURG), Brazil & Center of Computational Sciences (C3), Brazil)

An Analysis of Organizational Approaches for Advancing American University AI Education
Chan Lu (University of Georgia & USA, USA)

The importance of using the game to understand the problem of pollution and the complexity related to water management: an analysis based on the Discourse of the Collective Subject
F. Mota (Universidade Federal do Rio Grande, Brazil); Miriam Born (UFPEL, Brazil); Diana Francisca Adamatti (Universidade Federal de Rio Grande, Brazil); Marilton S Aguiar (Universidade Federal de Pelotas, Brazil)

The impact of the RPG on the players’ lives in the Water Resources Management context: an analysis based on the Discourse of the Collective Subject
Miriam Born (UFPEL, Brazil); F. Mota (Universidade Federal do Rio Grande, Brazil); Diana Francisca Adamatti (Universidade Federal de Rio Grande, Brazil); Marilton S Aguiar (Universidade Federal de Pelotas, Brazil)

VISIR+ Project Follow-up after four years: Educational and research impact
Ana M B Pavani (Pontificia Universidade Catolica do Rio de Janeiro, Brazil); Clara Viegas (Polytechnic of Porto, Portugal); Natércia Maria Pereira Machad Lima (Polytechnic of Porto, School of Engineering (ISEP), Portugal); Gustavo R. Alves (Polytechnic of Porto, Portugal); Maria Arcelina Marques (School of Engineering - Polytechnic of Porto & Porto Biomechanics Laboratory, Portugal); Andre V Fidalgo (Polytechnic of Porto - School of Engineering (ISEP), Portugal); Frederico Lázaro Jacob (Polytechnic of Porto, Portugal); Juarez Bento Silva (Universidade Federal Santa Catarina, Brazil); Susana Marchisio (Facultad de Ciencias Exactas, Ingenieria y Agrimensura - Universidad Nacional de Rosario, Argentina); Luis Carlos Schlichting (Instituto Federal de Santa Catarina, Brazil); Fernando Sória (Universidade de Santiago del Estero, Argentina); Federico Lerro (Universidad Nacional de Rosario, Argentina); William S. Barbosa (PUC-Rio, Brazil); Reginaldo Steinbach (Instituto Federal de Santa Catarina, Portugal); Paulo Manoel Mafra (UFSC, Brazil)
### Detailed Program – Friday, October 20th

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:20 – 3:30 PM</td>
<td><strong>ERM Business Meeting</strong></td>
<td><strong>Room: Traditions</strong></td>
</tr>
<tr>
<td>3:45 - 4:15</td>
<td><strong>B-3: Friday Afternoon Break</strong></td>
<td><strong>Room: Second Floor Foyer &amp; MSC 2401</strong></td>
</tr>
<tr>
<td>4:15 - 5:45</td>
<td><strong>PP-34: Pedagogical and Instructional Approaches #10</strong></td>
<td><strong>Room: MSC 2406 A</strong></td>
</tr>
</tbody>
</table>

#### Project-Based Learning to Assess Flood Risk and Mitigation Strategies for Coastal Communities: A Case Study
Raul Zapata Lopez and Ismael Pagan Trinidad (University of Puerto Rico - Mayaguez, Puerto Rico); Carla Lopez del Puerto (University of Puerto Rico - Mayaguez, USA)

#### The Importance of Project-Scale Scaffolding for Retention and Experience in Computing Courses
Juliana G de Souza (Virginia Commonwealth University, USA); Mikaila Flavell and Ahmad D Suleiman (Clarkson University, USA); David Shepherd (Louisiana State University, USA); Jan DeWaters, Mary M Small, Yu Liu and Daqing Hou (Clarkson University, USA)

#### Implementation of an Effective Project-Based Learning Methodology in the Freshman Year of Engineering and Technology Programs
Mohammed Mujahid Ulla Faiz (University of Westminster, United Kingdom (Great Britain) & Presidency University, India); M. Rani (Sir MVIT, India); Manaswini Ramakrishnappa (Presidency University Bangalore, India); Rajiv Ranjan Singh (Presidency University, India); Sampath Sivaperumal (Presidency University, Bengaluru, India); Azzedine Zerguine (KFUPM, Saudi Arabia)

#### Exploring the Impact of Engineering Projects in Community Service on Engineering Students’ Perspectives About Engineering as a Major
Isil Anakok (Virginia Tech, USA); Mark Huerta (Virginia Tech & 33 Buckets, USA); Andrew Katz (Virginia Tech, USA)

#### Promoting Professional Competencies through Interdisciplinary PBL: An Experience Report in Computing Higher Education
Simone C. dos Santos, Jéssyka Vilela and Alexandre Vasconcelos (Federal University of Pernambuco, Brazil)

#### Fostering collaborative learning through autograded Canvas quizzes
Susan N Ritchey (Texas A&M University, USA)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:15 – 5:45</td>
<td><strong>PP-35: Pedagogical and Instructional Approaches #11</strong></td>
<td><strong>Room: MSC 2406 B</strong></td>
</tr>
</tbody>
</table>
Detailed Program – Friday, October 20th

Understanding Student Engagement during an Experiential Learning Task Using Eye Tracking: A Case Study
Aparajita Jaiswal (Purdue University, West Lafayette, USA); Jeevithashree Divya Venkatesh and Gaurav Nanda (Purdue University, USA)

Design and Implementation of Large-Scale Summer Undergraduate Research Programs: Evidence-Based Practice in Engineering Education
Gabriella M Torres, Edward Berger, David Evenhouse and Andres Torres (Purdue University, USA)

Incoming CS1 Students' Misconceptions on Arrays
Syeda Fatema Mazumder and Manuel A. Pérez-Quiñones (University of North Carolina at Charlotte, USA)

Food Battle: the gamification concept in the nutritional field
Michel Hecker Faria (Universidade de São Paulo, Brazil); Paulo S. Souza (University of Sao Paulo, Brazil); Carla Roberta O. Carvalho (University of São Paulo, Brazil); Alexandre Ponce de Oliveira (Faculdade de Tecnologia de Lins & Universidade de São Paulo, Brazil); Matheus H. D. Cirillo (University of Sao Paulo, Brazil); Gustavo M S C Ferreira (University of São Paulo, Brazil)

Supporting Active Learning in STEM Higher Education through the UCD Sprint
Ioana Visescu, Marta Lárusdóttir and Anna Sigridur Islind (Reykjavik University, Iceland)

Understanding Engineering Students' Connection Making: A Sequential Explanatory Mixed Methods Study
Ying Wang (Georgia Institute of Technology, USA); Joyelle Harris (Georgia Tech, USA)

4:15 – 5:45
PP-36: Pedagogical and Instructional Approaches #12
Room: MSC 2405

On Delivering the Electrical Engineering Program at the RELLIS Campus
Abdallah Farraj (Texas A&M University System, USA); Faycal Znidi and Mohamed Morsy (Texas A&M University Texarkana, USA)

Enabling Investigation of Impacts of Inclusive Collaborative Active Learning Practices on Intersectional Groups of Students in Computing Education
Yash Tadimalla and Mary Lou Maher (University of North Carolina at Charlotte, USA); Audrey Rorrer (University of North Carolina at Charlotte & College of Computing and Informatics, USA); Marlon Mejias (University of North Carolina Charlotte, USA); Celine Latulipe (University of Manitoba, Canada); Jamie Payton, Gene Kwatny, John Fiore and Andrew Rosen (Temple University, USA)

Spaced retrieval practice improves engineering student performance in physics
Campbell R. Bego (University of Louisville & J. B. Speed School of Engineering, USA); Cenetria Crockett and Alvin Tran (University of Louisville, USA); Patricia Ralston (University of Louisville Speed School of Engineering, USA); Raymond Chastain (University of Louisville, USA); Keith B Lyle (TRANSFR, Inc, USA)
Detailed Program – Friday, October 20th

Exploring the Impact of Self-Regulation of Learning Support on Programming Performance and Code Development
Leonardo Soares (Federal University of Campina Grande, Brazil); Anabela Gomes (Polytechnic Institute of Coimbra - ISEC & University of Coimbra, Portugal); António José Mendes (University of Coimbra & CISUC, Dep. of Informatics Engineering, Portugal)

The Global Apprenticeship Program (GAP): bridging the gap between talent and opportunities
Andrés Felipe Salazar-Gómez and Aikaterini Bagiati (Massachusetts Institute of Technology, USA); Johanna Molina (Talanta, Colombia); Erdin Beshimov (Massachusetts Institute of Technology, USA); Cynthia Breazeal (MIT Media Lab, USA)

4:15 – 5:45

PP-37: Diversity and Broadening Participation #5
Room: REVEILLE I & II

If I Had More Time: A Transactional Perspective on Supporting Nontraditional Students in Engineering
Cory Brozina (Youngstown State University, USA)

Math for those with Severe Low Vision
Joshua Earl Howell and Francis Quek (Texas A&M University, USA)

Liberation by Robotics: Street Engineers as Toy Makers in Africa
Lannie Uwu-khaeb (University of Turku, Namibia); Erkki Sutinen (University of Turku, Finland); Jacob Nielsen (University of Southern Denmark, Denmark); Marcus Duveskog (Contextualize, South Africa); Annastasia Shipepe (University of Namibia, Namibia)

Exploring Servingness for Low-Income Academically Talented Students (LIATS) through Individual Development Plans (IDPs)
Carla Lopez del Puerto (University of Puerto Rico - Mayaguez, USA); Manuel Jimenez (University of Puerto Rico at Mayaguez, Puerto Rico); Nayda G. Santiago (University of Puerto Rico, Mayaguez, USA); Pedro Quintero (University of Puerto Rico-Mayaguez, USA); Sonia Bartolomei (University of Puerto Rico at Mayaguez, Puerto Rico); Luisa Guillemand, Oscar Marcelo Suarez and Nelson Cardona (University of Puerto Rico - Mayaguez, Puerto Rico); Aidsa I. Santiago-Román (University of Puerto Rico at Mayaguez, Puerto Rico)

Persistence Priorities and Financial Servingness in an Emerging HSI
Sarah Hug (Colorado Evaluation and Research Consulting, USA)

Exclusionary experiences of minoritized students in engineering, their description of locations and actors
Matilde Sánchez-Peña, Kristen R. Moore, Anne M McAlister, Syed Ali Kamal and Jasmine Epps (University at Buffalo, USA)

A Personalized Learning Approach to Support Students with Diverse Academic Backgrounds
Bowen Hui (University of British Columbia, Canada)
Detailed Program – Friday, October 20th

4:15 – 5:45
PP-38: Professional Development #4
Room: MSC 2404

Fostering an Equity-Minded Student Success Culture in STEM Through Faculty Development
Tram Dang (Purdue University & Santa Monica College, USA); Tim Nguyen (Independent Consultant, USA); Ciarán Brewster, Kristin Lui-Martinez and Silvana Carrion-Palomares (Santa Monica College, USA)

How Uncomfortable Conversations Can Lead to Better Faculty Preparation and Engineering Pedagogy Centered on Humanity
Lance L. A. White and Karan Watson (Texas A&M University, USA); Tracy Hammond (Texas A&M University, USA)

A Preliminary Time Study Among First-Year Engineering Undergraduates: Toward Understanding the Curricular and Co-curricular Divide
Andrew Olewnik, Matilde Sánchez-Peña, Kevin Burke and Jennifer Zirnheld (University at Buffalo, USA)

Yes, SHE Can! Program: Closing Gender Gap in STEM Education for a More Diverse Workforce
Sarah Huizar (The University of Texas at El Paso, USA); Diane E. Golding (University of Texas at El Paso, USA); Daniela Guel-Valenzuela and Karla Ayala (The University of Texas at El Paso, USA); Victor M. Garcia and Annalisa Perez (University of Texas at El Paso, USA)

State-of-the Art Augmented Reality in Construction Education to Teach Cost Estimate
Tulio Sulbaran and Amani Qasrawi (The University of Texas at San Antonio, USA)

Design Sprints in Research: A Novel Approach for Enhancing the Professional Development of Graduate Students
Tahira Reid and Catherine Berdanier (Pennsylvania State University, USA)

What Role Do Tangibles Play in Fostering Design Thinking Skills? An Exploratory Study
Yousef Jalali, Mary Jean Bürer, Natascia Petringa and Jessica Dehler Zufferey (EPFL, Switzerland)

4:15 – 5:45
PP-39: Curriculum and Course Development #6
Room: CORPS I & II

Agile Teaching: Automated Student Support and Generate Feedback
Majid Bahrehvar (University of Calgary, Canada); Mohammad Moshirpour (University of California, Irvine, USA)

What is Skill? (and why does it matter?)
Roger McDermott (Robert Gordon University, United Kingdom (Great Britain)); Mats Daniels (Uppsala University, Sweden)
Detailed Program – Friday, October 20th

**The role of soft skills in engineering education**
Marcin Fojcik (Western Norway University of Applied Sciences, Norway); Martyna K. Fojcik (Volda University College, Norway); Adam Ziebinski (Silesian University of Technology, Poland); Bjarte Pollen and Anne-Lena Kampen (Western Norway University of Applied Sciences, Norway)

**Content and skills for teaching Software Process Improvement in the Computer Science Course: a mapping of ACM/IEEE, SBC, SWEBOK, CMMI AND MR-MPS-SW assets**
Adolfo Colares and Sandro Ronaldo Bezerra Oliveira (Federal University of Pará, Brazil); Julio Cezar Costa Furtado (Federal University of Amapá, Brazil)

**Exploring the impact of incorporating entrepreneurial activities in higher education**
Surupa Shaw (MTDE, Texas A&M University & Texas A&M University, USA); Mark Perez (TEXAS A&M UNIVERSITY, USA)

**Student Autonomy in Collaborative Learning: Effects of Meeting Time and Team Consistency**
Hongxuan Chen, Morgan M Fong, Geoffrey L Herman and Mariana Silva (University of Illinois at Urbana-Champaign, USA)

**Tool Usage Patterns of Mechanical Engineering Students in Academic Makerspaces**
Samuel Blair (Texas A&M University, USA); Claire R Kaat and Julie Linsey (Georgia Institute of Technology, USA); Astrid Layton (Texas A&M University, USA)

4:15 – 5:45
**PP-40: Attitudes and Perceptions #1**
*Room: ROSS I & II*

**From making spaces to making change: The future of making in ECE**
Shawn S. Jordan (Arizona State University, USA); R Cheville (Bucknell University, USA); Casey J Smith (University of Illinois at Urbana-Champaign, USA)

**How Participating in Extracurricular Activities Supports Dimensions of Student Wellness**
Beata Johnson and Joyce B. Main (Purdue University, USA); Andrew Katz (Virginia Tech, USA)

**Generative AI in Computing Education: Perspectives of Students and Instructors**
Cynthia Zastudil, Magdalena Rogalska, Christine Kapp, Jennifer Vaughn and Stephen MacNeil (Temple University, USA)

**Engineering Students’ Transformative Learning Experiences from A Virtual International Collaborative Experiential Program**
Sukeerti Shandliya and Gibin Raju (University of Cincinnati, USA); Cedrick A. K. Kwuimy (University of Cincinnati, USA); So Yoon Yoon (University of Cincinnati, USA)

**Using thematic analysis to characterize the connection between sociotechnical engineering courses and students' sense of belonging and engineering identity**
Felicity Bilow and Jan DeWaters (Clarkson University, USA)
Analyzing Role Playing Game and its Roles and Concepts Based on Collective Subject Discourse
F. Mota (Universidade Federal do Rio Grande, Brazil); Miriam Born (UFPEL, Brazil); Diana Francisca Adamatti (Universidade Federal de Rio Grande, Brazil); Marilton S Aguiar (Universidade Federal de Pelotas, Brazil)

Exploring Trends in Research, Teaching, and Mentoring Self-efficacy Beliefs of Engineering and Computing Graduate Students
Jennifer Brown, Caroline Ringler, Marshal Rice and Karen A High (Clemson University, USA)

4:15 – 5:45
PP-41: Computing #5
Room: HULLABALOO

A systematic literature review of educational spatial visualization software and implementations for computing education
John W Lynch and Gibin Raju (University of Cincinnati, USA)

Experiences with a Hardware Description Language for a CS-majors' Computer Organization Course
Charles Reiss (University of Virginia, USA); Luther Tychonievich (University of Illinois Uban-Champaign, USA)

Assessing Student Programming Process Using Automated Reasoning
Ruben Acuña and Ajay Bansal (Arizona State University, USA)

Autograder Impact on Software Design Outcomes
Ruben Acuña, Tyler Baron and Srividya K Bansal (Arizona State University, USA)

Understanding Students’ Frustration and Confusion during a Programming Task: A Multimodal Approach
Rakhi Batra and Zahra Atiq (The Ohio State University, USA)

An analysis of interventions with students with Autistic Spectrum Disorder (ASD) using gamified geometric thinking
Lidiane M Pereira, Sra (University of Rio Grande, Brazil); Regina Barwaldt (Federal University of Rio Grande (FURG), Brazil & Center of Computational Sciences (C3), Brazil); Vinicius M. Oliveira (Federal University of Rio Grande, Brazil)

4:15 – 5:45
PP-42: Assessment #2
Room: LEADERSHIP LAB

A Peer Review Approach to Grading Projects in Computer Courses
Liang Buaa Zhang, Yue Zong, Tianyi Chen, Yafeng Ma, Shuo An and Lijun Zhang (Beihang University, China)
Detailed Program – Friday, October 20th

**EmoSociograms: an open-source psychometric tool for the assessment of social and emotional competencies of students**

Eleni Fotopoulou (Institute of Communication and Computer Systems / National Technical University of Athens, Greece); Anastasios Zafeiropoulos (Institute of Communication and Computer Systems/National Technical University of Athens, Greece); George Themelis (National Technical University of Athens, Greece); Êlia López Cassà (University of Barcelona, Spain); Isaac Muro Guiu (Institut Escola Coves d en Cimany, Spain); Christos Miamis (National Technical University of Athens, Greece); Symeon Papavassiliou (Institute of Communication and Computer Systems (ICCS) - National Technical University of Athens, Greece)

**Quality control of crowd labeling for improving the quality of peer assessments**

Banpreet Singh Chhabra and Ed Gehringer (North Carolina State University, USA)

**Increasing Accuracy in Predicting Student Test Scores with Regression using Principal Component Analysis**

Nastaran Davudi Pahnehkolaee, Shawanda Littlejohn, Lauria Lewis and Michael Brown (University of Maryland Baltimore County, USA)

4:15 – 5:45
**PP-43: K12 STEM Education #5**
Room: OAK

**iFractions 2.0: improving the feedback of a fractions Web learning game**

Priscila Lima (Federal University of Goias, Brazil); Laira das Almas Silva (University of São Paulo, Brazil); Antonio Fernandes (Universidade de São Paulo, Brazil); Carlos Morimoto (University of Sao Paulo, Brazil); Leônidas O Brandão (University of São Paulo, Brazil)

**Biologically Inspired Design: High School Students' Engagement in BID Integrated Learning in Engineering Classrooms**

Abeera P. Rehmat, Meltem Alemdar, Micheal Helms, Dyanne Baptiste Porter, Jeffery Rosen and Marc Weissburg (Georgia Institute of Technology, USA)

**Fostering Design Thinking for High School Students through an Automotive Engineering Project**

Indah Widiastuti, Timur Abdia Oktavi, Towip Towip and Cucuk Budiyanto (Universitas Sebelas Maret, Indonesia)

**Physical computational models for horizontal learning in STEM**

Ting Liu and Francis Quek (Texas A&M University, USA); Glen Hordemann (Texas A&M University & Texas A&M Embodied Interaction Lab, USA)

**Introduction to Machine Learning with TinyML in K-12 Education: A Case Study**

Algeir P Sampaio (Federal University of Bahia, Brazil); Paulo Farias (UFBA, Brazil); Roberto A Bittencourt (University of Victoria, Canada)
Detailed Program – Friday, October 20th

Investigating the Connection between Teachers' Factors and Students' Performance in Mathematics: A UAE Case Study
Maisam Wahbah (University of Dubai, United Arab Emirates); Tamador Elboshra (UAE Ministry of Education, United Arab Emirates); Yasmin Halawani (University of Dubai, United Arab Emirates)

4:15 – 5:45
PP-44: Design #1
Room: TRADITIONS

Meta-Analysis of Hackathon Literature
Cecilia La Place and Shawn Jordan (Arizona State University, USA)

Ethical Safeguards & Behavioral Psychology Competencies: A Framework for Computer Science Capstone Project Design
Pierre Atieh (Texas A&M University Kingsville, USA); Eman Hammad (University of Toronto, Canada & Texas A&M University, USA); Celeste A Riley (Texas A&M University Kingsville, USA)

Exploration of innovative spaces that enable communication and collaboration in diverse settings
Trey Talko, Hadi Ali and Jonathan Adams (Embry-Riddle Aeronautical University, USA)

Pedagogy and Case Study for Sustainable Structural Product Eco-Design
David Kazmer (University of Massachusetts, Lowell, USA); Amir Ameli, Davide Masato, Akshay Kokil, Shanna R Thompson and Jill H. Lohmeier (University of Massachusetts Lowell, USA)

4:15 – 5:45
PP-45: Education Level #4
Room: EAGLE

Transformative Pedagogy as a Reflective Approach for Promoting Intercultural Self-Awareness In the Context of Teamwork
Irene Hensista, Shreya Guddeti, Devang Atul Patel, Sakhi Aggrawal, Gaurav Nanda and Alejandra J. Magana (Purdue University, USA)

A Blueprint for Adopting Agility in Teaching, Research and Service in an Engineering Department
Omar Ochoa, Massood Towhidnejad, James Pembridge and Radu F. Babiceanu (Embry-Riddle Aeronautical University, USA)

AI-Cybersecurity Education Through Designing AI-based Cyberharassment Detection Lab
Ebuka Okpala (Clemson University, USA); Nishant Vishwamitra (The University of Texas at San Antonio, USA); Keyan Guo (University at Buffalo, USA); Liao Song and Long Cheng (Clemson University, USA); Hongxin Hu (University at Buffalo, USA); Yongkai Wu (Clemson University, USA); Xiaohong Yuan (North Carolina A & T State University, USA); Jeannette Wade (UNC Greensboro, USA); Sajad Khorsandroo (North Carolina A&T State University, USA)
Detailed Program – Friday, October 20th

Automatic Formative and Motivational Feedback Personalized for Introductory Programming Course
Maristela Holanda (Texas A&M University, USA); Lucas Miranda (University of Brasilia, Brazil); Dilma Da Silva and Christiana Chamon (Texas A&M University, USA); Camilo Dorea and Fernanda Macedo (University of Brasilia, Brazil)

| 6:00 - 9:00 |
| SE-AP: Social Event, AggiePark |
| Room: AggiePark |
Detailed Program – Saturday, October 21st

8:00 - 9:30
PP-46: Pedagogical and Instructional Approaches #13
Room: MSC 2406 A

A Quantum Abacus for Teaching Quantum Algorithms
Dan-Adrian German (Indiana University Bloomington, USA); Marcelo Pias (FURG, Brazil); Qiao Xiang (Xiamen University, China); Sreesha Kuruvadi (Indiana University Bloomington, USA)

An Innovative Way to Teach Computer Programming for Middle and High Schools Students in the Summer Camps
Stefan Andrei and Sujing Wang (Lamar University, USA)

An Elaboration of Research-Led Computer Science Framework for Early Education in the Kingdom of Saudi Arabia
Noha Abdulkhaliq M Alharbi (University of Glasgow); Quintin Cutts (University of Glasgow, United Kingdom (Great Britain))

Transforming Student Learning through Industry - Driven Software Development Projects
Alex Q. Chen, Indriyati Atmosukarto and Serena Hui Lin Goh (Singapore Institute of Technology, Singapore)

Psychology Techniques in Education Improve Student Academic Outcomes and Mental Health
Daniella J Pautz and Claire Honeycutt (Arizona State University, USA)

Validation of Felder-Solomon’s Index of Learning Styles questionnaire and learning style preferences
Geraldo Nhadumbuque (Portugal-Coimbra, USA); Maria José Marcelino (University of Coimbra, Portugal); Anabela Gomes (Polytechnic Institute of Coimbra - ISEC & University of Coimbra, Portugal)

Impact of Instructional Activities on Students' Positivity, Participation, and Perceived Value in a Systems Analysis and Design Course
Syeda Fizza Ali (Texas A&M University, USA); Daniel Bang (Texas A&M University, USA); Alejandra J. Magana (Purdue University, USA); Saira Anwar (Texas A&M University, USA)

8:00 – 9:30
PP-47: Pedagogical and Instructional Approaches #14
Room: MSC 2406 B

In Search of a Philosophy of Computing Education
Roger McDermott (Robert Gordon University, United Kingdom (Great Britain)); Mats Daniels (Uppsala University, Sweden); Stephen T Frezza (Franciscan University of Steubenville, USA)
Detailed Program – Saturday, October 21st

Enhancing Meta-understanding of Entity and Relationship Diagrams in Database Modeling using Concept Maps: An Experimental Study
Wagner de Andrade Perin (Universidade Federal do Espírito Santo, Brazil); Davidson Cury (UFES-Universidade Federal do Espírito Santo, Brazil); Camila Zacché de Aguiar (Federal University of Espirito Santo - UFES, Brazil); Crediné Silva de Menezes (Universidade Federal do Rio Grande do Sul, Brazil)

20 Years of EPICS at Butler University: Experiences And Lessons Learned
Lucas W Johnson and Panagiotis (Panos) Linos (Butler University, USA)

Uncovering Patterns of SQL Errors in Student Assignments: A Comparative Analysis of Different Assignment Types
Sophia Yang, Zepei Li, Geoffrey L Herman, Kathryn Cunningham and Abdussalam Alawini (University of Illinois at Urbana-Champaign, USA)

Synchronous and Asynchronous Formative E-Assessments for Scalable Mentoring in Engineering Education
Ummay Ubaida Shegupta and René Schmidt (Chemnitz University of Technology, Germany); Wolfram Hardt (TU Chemnitz, Germany)

Addressing the Barriers of Knowledge Transfer: Using ePortfolios to Enhance Student Reflection in Technical Courses
Rebecca L Thomas, Sarah Appelhans, Richard J. Kozick and Christa Matlack (Bucknell University, USA); Philip Asare (University of Toronto, Canada); Michael S. Thompson, Stewart Thomas, Robert Nickel and R. Alan Cheville (Bucknell University, USA)

8:00 – 9:30
PP-48: Pedagogical and Instructional Approaches #15
Room: MSC 2405

Inclusion of Digital Entrance and Exit Tickets into an Undergraduate Cybersecurity Engineering Experiential Lab to Enhance Student Learning and Increase Self-assessment
Julie A. Rursch and Megan K Ryan (Iowa State University, USA); Andy Luse (Oklahoma State University, USA)

An Exploratory Study to Assess the Usability of a Groupware with Multi-Agent Systems
Joethe Moraes de Carvalho and José Francisco Magalhães, Netto (Federal University of Amazonas, Brazil)

Analysis of a course to electrical engineering from a conceptual approach by Hannah Arendt: perspectives and educational meaning. Case of a course on energy, environment and sustainability
Jose Baesso Grimoni, Sr and Edgar Mendoza Parada (Universidade de Sao Paulo, Brazil)
## Detailed Program – Saturday, October 21st

With emerging tools such as ChatGPT, do we have to rewrite our learning objectives - CASE study in Cybersecurity  
Peter A Jamieson (Miami University, USA); Suman Bhunia (Miami University, Ohio, USA); Dhananjai M. Rao (Miami University, USA)

**Manipulatives for Teaching Computer Science Concepts**  
Jennifer Parham-Mocello, Garrett Berliner and Ayushi Gupta (Oregon State University, USA)

**Innovating AI Leadership Education**  
Xiaoxue Du, Sharifa Alghowinem, Matthew Taylor, Kate Darling and Cynthia Breazeal (MIT Media Lab, USA)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 – 9:30</td>
<td><strong>PP-49: Diversity and Broadening Participation #6</strong></td>
<td>REVEILLE I &amp; II</td>
</tr>
<tr>
<td><strong>Infrastructural elements to foster educational equity in engineering</strong></td>
<td>Katrina Robertson, Hadi Ali and Jonathan Adams (Embry-Riddle Aeronautical University, USA)</td>
<td></td>
</tr>
<tr>
<td><strong>Gender Differences in the Group Dynamics of Smaller CS1 Project Groups</strong></td>
<td>Bjørn H Westh, Nanna Inie, Louise Barkhuus and Claus Brabrand (IT University of Copenhagen, Denmark)</td>
<td></td>
</tr>
<tr>
<td><strong>Student Feedback on Opt-in, Inclusive, Course-Integrated Study Groups</strong></td>
<td>Bridget Agyare, Manooshree Patel, Alicia Matsumoto and Gireeja Ranade (University of California, Berkeley, USA)</td>
<td></td>
</tr>
<tr>
<td>8:00 – 9:30</td>
<td><strong>PP-50: Professional Development #5</strong></td>
<td>MSC 2404</td>
</tr>
<tr>
<td><strong>Computing students’ perceptions towards ePortfolios</strong></td>
<td>Hege Annette Olstad, Xiaomeng Su and Birgit Rognebakke Krohgstie (Norwegian University of Science and Technology, Norway)</td>
<td></td>
</tr>
<tr>
<td><strong>What Makes Project Teams Succeed? Students’ Post-Covid Perceptions on IT Project Management Education Fostering Professional Skills</strong></td>
<td>Dominik Dolezal (University of Vienna, Austria); Renate Motschnig (University of Vienna &amp; Faculty of Computer Science, Austria)</td>
<td></td>
</tr>
<tr>
<td><strong>Evaluating students’ learning expectations and perceptions in a university course on Digital Transformation in the framework of learning objective taxonomies</strong></td>
<td>Pelin Yueksel Arslan, Georg Noehrer and Fares Kayali (University of Vienna, Austria)</td>
<td></td>
</tr>
</tbody>
</table>
Detailed Program – Saturday, October 21st

**UnplugGamify: a process to design unplugged gamification in education**  
Isabelle Melo do Nascimento (Universidade Federal da Paraíba, Brazil); Wilk Oliveira (Tampere University, Finland); Pasqueline Dantas, Luiz Oliveira da Silva Junior and José Rocha do Amaral Neto (Universidade Federal da Paraíba, Brazil)

**Lessons Learned During the Construct of a Brain Activity Measuring Activity to Improve Construction Workforce Development**  
Tulio Sulbaran (The University of Texas at San Antonio, USA); Krishna Kisi (Texas State University, USA)

**Strategies for Smartly Infusing Design, Innovations, and Analysis for Enhancing Research and Student Projects: A Case Study**  
Divya Nalla (Nalla Malla Reddy Engineering College, India); Deepak L. Waikar (Freelance, Singapore)

**8:00 – 9:30**  
**PP-51: Curriculum and Course Development #7**  
*Room: CORPS I & II*

- A diagnosis on the teaching of Software Design in a sample of undergraduate courses in Computer Science in Brazil  
  Vitor de Souza Castro and Sandro Ronaldo Bezerra Oliveira (Federal University of Pará, Brazil)

- Developing Higher Education - Post-Pandemic - Influenced by AI  
  Olaf Hallan Graven and Lachlan MacKinnon (University of South-Eastern Norway, Norway)

- Incorporation of Sustainability into Engineering Curriculum  
  Kenneth R. Leitch (West Texas A&M University, USA); Emad Manla (West Texas A&M University, USA); Roy Issa (West Texas A&M University, USA)

- A review of synergies between Industry 4.0, Construction 4.0, and Education 4.0 in the engineering education context  
  Alex Sander Clemente Souza (Purdue University & UFSCar, USA); Luciana Debs (Purdue University, USA)

- Inserting Extension in the Engineering Undergraduate Courses Curriculum  
  Eder Mateus Gonçalves (Universidade Federal do Rio Grande - FURG, Brazil); Adriano Werhli (Federal University of Rio Grande, Brazil); Sam Devincenzi (FURG, Brazil); Vinicius M. Oliveira (Federal University of Rio Grande, Brazil); André Prisco (Universidade Federal do Rio Grande - FURG, Brazil); Cleo Zanella Billa, Ewerson Carvalho and Rafael dos Santos (Federal University of Rio Grande, Brazil)
### Detailed Program – Saturday, October 21st

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 – 9:30</td>
<td>PP-52: Attitudes and Perceptions #2</td>
<td>Novel E-Learning Experience and Perceptions with Impacts from Educational Key Opinion Leaders</td>
<td>Susan Zhang, Jun Shen and Jun Yan (University of Wollongong, Australia)</td>
</tr>
<tr>
<td></td>
<td>Room: ROSS I &amp; II</td>
<td>Exploring a Digital Maturity Metric for Schools</td>
<td>Sarah Gibson (CooperGibson Research, United Kingdom (Great Britain)); Colin Brown (Five Tribes Ltd, United Kingdom (Great Britain))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A systematic mapping of affective intelligent tutor systems in engineering education</td>
<td>Thiago Santos Figueira (University of the People, Brazil); José Francisco Magalhães, Netto (Federal University of Amazonas, Brazil)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Investigating online searching behavior based on Google Trends in MENA Region before and after COVID-19</td>
<td>Abdelkader Nasreddine Belkacem (United Arabs Emirates University, United Arab Emirates); Nuraini Jamil and Saed Alrabaee (United Arab Emirates University, United Arab Emirates)</td>
</tr>
<tr>
<td>8:00 – 9:30</td>
<td>PP-53: Computing #6</td>
<td>Drawing a computer scientist: Assessing the images of the computer scientist among K-8 teachers</td>
<td>Minsun Shin and Sumi Hagiwara (Montclair State University, USA); Katherine Herbert (1 Normal Ave &amp; Montclair State University, USA); Vaibhav Anu, Rebecca Goldstein and Kazi Zakia Sultana (Montclair State University, USA)</td>
</tr>
<tr>
<td></td>
<td>Room: HULLABALOO</td>
<td>The Effects of an Accessible Computing Curriculum for Students with Autism Spectrum Disorders</td>
<td>Abdurrahman Arslanyilmaz, Margie Briley and Gregory Boerio (Youngstown State University, USA); Katie Petridis (Potential Development, USA); Ramlah Ilyas (Youngstown State University, USA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>An Exploratory Study on the Impact of AI tools on the Student Experience in Programming Courses: an Intersectional Analysis Approach</td>
<td>Mary Lou Maher, Yash Tadimalla and Dhruv Dhamani (University of North Carolina at Charlotte, USA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DLUnit: A Unit Testing Framework for Simulated Digital Logic Circuits</td>
<td>Zachary Kurmas (Grand Valley State University, USA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Learning game programming through narrative, sound effects, and music in text-based games: A creative approach to digital game education</td>
<td>Glaucio Moro, Claudio Carvilhe and Bruno Campagnolo de Paula (Pontificia Universidade Católica do Paraná, Brazil); Carlos Silla (Pontificia Universidade Católica do Paraná, Brazil)</td>
</tr>
</tbody>
</table>
Detailed Program – Saturday, October 21st

Aligning Academic Efforts with Key Industries: A Case of Computing at the University of Namibia
Maria N Ntinda (University of Turku & University of Namibia, Finland); Carolina Islas Sedano, Mikko Apiola and Erkki Sutinen (University of Turku, Finland)

8:00 – 9:30
PP-54: Assessment #3
Room: LEADERSHIP LAB

Analysis of Learning Outcomes in Software Engineering: an Automated Reflection Analysis Tool
Nasrin Dehbozorgi and Koushik Goud Dindu (Kennesaw State University, USA)

A study on how to classify exercises in introductory programming courses: a Moodle plugin contribution
Thiago Gomes Veríssimo, Sr. (Universidade de São Paulo, Brazil); Leônidas O Brandão and Ewout ter Haar (University of São Paulo, Brazil)

Optimizing Indonesian Education through National Standards: Implications for Engineering and Computer Science
Paul Arjanto and Ibrahim Bafadal (Universitas Negeri Malang, Indonesia); A Atmoko (State University of Malang & Educational Faculty, Indonesia); Asep Sunandar and Feibry Feronika Wiwenly Senduk (Universitas Negeri Malang, Indonesia)

A Replication Study: Validation of the 19-item Short Form for the MUSIC Inventory for Engineering Student Engagement
Susan L. Amato-Henderson and Jon Sticklen (Michigan Technological University, USA)

8:00 – 9:30
PP-55: AI, Gamification, Project Based Learning, and Others
Room: OAK

Analysis of Categorical and Numerical Variables for Dropout Intervention in Educational Settings
Andres Gonzalez-Nucamendi (Tecnologico de Monterrey, Escuela de Diseño Ingeniería y Arquitectura, Mexico); Julieta Noguez and Luis J. Neri (Tecnologico de Monterrey & Escuela de Ingeniería y Ciencias, Mexico); Víctor Robledo-Rella and Rosa M.G. García-Castelán (Tecnologico de Monterrey, Mexico)

Exploring NLP-based Methods for Generating Engineering Ethics Assessment Qualitative Codebooks
Ashish Hingle (George Mason University, USA); Andrew Katz (Virginia Tech, USA); Aditya Johri (George Mason University, USA)

Enhancing Teamwork through Games: A Systematic Literature Review
Sakhi Aggrawal and Henrietta Boowuo (Purdue University, USA)
Detailed Program – Saturday, October 21st

**Design and Development of a Remote Laboratory for the Study of Physical Concepts**
Márcia de Souza Xavier and Joethe Moraes de Carvalho (Federal University of Amazonas, Brazil)

**Adaptive learning in programming education: a systematic mapping of the literature**
Angela Vitória Mota Vieira and José Francisco Magalhães, Netto (Federal University of Amazonas, Brazil)

---

8:00 – 9:30

**PP-56: Assessment #4**
*Room: TRADITIONS*

Reassessing assessment in pre-engineering statistics courses
Christopher Golubski (University of Texas at Austin, USA)

Attempts and Challenges in Establishing an Undergraduate AI Major
Chan Lu (University of Georgia & USA, USA); Awn Ja Lu (University of Georgia, USA)

New Perspectives on Education and Examination in the age of Artificial Intelligence
Lars Oestreicher (Uppsala University, Sweden)

Analysing Students' Motivation for acquiring Digital Competences
Alexandra Posekany (Danube University Krems, Austria); Georg Noehrer (University of Vienna, Austria); David Haselberger (University of Vienna & Faculty of Computer Science, Austria); Fares Kayali (University of Vienna, Austria)

---

8:00 – 9:30

**PP-57: Design #2**
*Room: EAGLE*

Project-Based Learning to Address Infrastructure Challenges: Designing Modular Classrooms for Natural Disasters
Carla Lopez del Puerto (University of Puerto Rico - Mayaguez, USA); Humberto Cavallin (University of Puerto Rico - Rio Piedras, Puerto Rico); Luisa Guillemard (University of Puerto Rico - Mayaguez, Puerto Rico); Fabio Andrade (University of Puerto Rico, Puerto Rico); Luis Lamboy (University of Puerto Rico - Mayaguez, Puerto Rico)

Engaged Student Learning through IoT-based Projects in Senior Capstone Design Courses: Particular Look at Student Engagement in Historically Underrepresented Groups
Mehrube Mehrubeoglu (Texas A&M University-Corpus Christi, USA); Liford McLauchlan and David L. Hicks (Texas A&M University-Kingsville, USA); Adetoun Yeaman (Wake Forest University, USA)

Methodological commitments in grounded theory, experiences of a novice researcher
Elliott Clement (Oregon State University, USA); James Huff (Harding University, USA); Shane Brown (Oregon State University, USA)
### Detailed Program – Saturday, October 21st

**A Low-Cost Robotic Arm Manipulator Model for Enhancing Student Learning in an Industrial Robots Course**  
Mohammad Mashagbeh (The University of Jordan, Jordan); Mustafa Awwad Al-khawaldeh (Philadelphia University Jordan, Jordan); Sanad Hussein (University of Jordan, Jordan); Husam AlAbdellat and Andrews Swidan (The University of Jordan, Jordan)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 - 10:00</td>
<td><strong>B-4: Saturday Morning Break</strong></td>
<td><strong>Room: Second Floor Foyer &amp; MSC 2401</strong></td>
</tr>
<tr>
<td>10:00 - 11:30</td>
<td><strong>WIP-27: Pedagogical and Instructional Approaches #16 [WIP]</strong></td>
<td><strong>Room: MSC 2406 A</strong></td>
</tr>
</tbody>
</table>

The potential role of AI-based Chatbots in Engineering Education. Experiences from a teaching perspective  
Miguel Morales Chan (Galileo University, Guatemala); Hector R. Amado-Salvatierra (Universidad Galileo, Guatemala); Rocael Hernandez-Rizzardini (Galileo University, Guatemala); Mónica De La Roca (Universidad Galileo, Guatemala)

Embedding a Problem Graph into Serious Games for Efficient Traversal Through Game Space  
Vidya Bommanapally (University of Nebraska Omaha, USA); Mahadevan Subramaniam and Abhishek Parakh (University of Nebraska at Omaha, USA)

Using Assignment Choice in Engineering Service Courses  
Robert Lightfoot (Texas A&M University, USA); Tracy Hammond (Texas A&M University, USA)

**A Hands-on Education Framework for Cybersecurity**  
Chang Phuong (University of Tennessee, Chattanooga, USA); Noman Saied (University of Tennessee, Chattanooga, USA & Chattanooga State Community College, USA); Li Yang (University of Tennessee at Chattanooga, USA)

Implementation of Formatively Assessed Student-Centered Instruction and Learning (FAISCAL) Strategy in Logic Circuits Course  
Justin Foreman, Keithan Ross and Ifeakandu Moses Nzewke (Prairie View A&M University, USA)

Are learning styles met through HyFlex modalities?  
Zory Marantz (NYC College of Technology, USA)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00 – 11:30</td>
<td><strong>WIP-28: Pedagogical and Instructional Approaches #17 [WIP]</strong></td>
<td><strong>Room: MSC 2406 B</strong></td>
</tr>
</tbody>
</table>

Data Visualization Capacity (DVC) Building Tool for Teaching and Learning Data Visualization  
Isha A Mahadalkar and Vetria L Byrd (Purdue University, USA)
Detailed Program – Saturday, October 21st

On the possibility of emotion recognition while question-answering utterances by voice analysis for junior high school students
Satori Hachisuka, Kayoko Kurita and Shin’ichi Warisawa (The University of Tokyo, Japan)

Moving from an ERASMUS+ Innovation Project on Mathematics in Engineering Education to the Teaching Practice: Learnings from the UPC Experience
Carles Serrat (Universitat Politècnica de Catalunya-BarcelonaTECH, Spain); M. Rosa Estela (Universitat Politècnica de Catalunya-BarcelonaTECH); M. Montserrat Bruguera and Chara Pantazi (Universitat Politècnica de Catalunya-BarcelonaTECH, Spain)

Developing a scale to measure student social and cognitive engagement in online science, technology, engineering, and math courses
Navid Yaghoubisharif, Shane Brown and Allyson Barlow (Oregon State University, USA)
GeoExplorer and Gender Identity: The Impact of Gender in a Game-Based Learning Environment
Simrun Mutha, Alexa Deeter, Jen L Sundstrom and Yevgeniya V Zastavker (Olin College of Engineering, USA); Casper Harteveeld (Northeastern University, USA); Victoria Bennett (Rensselaer Polytechnic Institute, USA); Tarek Abdoun (NYU Abu Dhabi, United Arab Emirates)

Personalized Learning in Automation Education: A 3D AI-Based Approach
Asmar Ali, Andreas Deuter and Leon Wehmeier (OWL University of Applied Sciences and Arts, Germany)

10:00 – 11:30
WIP-29: Pedagogical and Instructional Approaches #18 [WIP]
Room: MSC 2405

Supervision-driven design: A lab setup for teaching and training on industrial control network
Dag Samuelsen and Olaf Hallan Graven (University of South-Eastern Norway, Norway)

Improving Delivery of UML Class Diagrams Concepts in Computer Science Education Through Collaborative Learning
Rupinder Kaur (North Dakota State University, USA); Malik Muhammad (NDSU, USA); Maninder Singh (St. Cloud State University, USA)

Student Engagement with Pre-recorded Lecture Videos in a Flipped-class Format
David M. Pabst, Vincent J. Taverna, Samantha E. Wismer, Lee A Dosse and Matthew Barry (University of Pittsburgh, USA)

Methodology and Development of Open-Source Lecture Nuggets that create Hands-on Engineering and Discussion Spaces
Jennifer Hasler (Georgia Institute of Technology, USA)

Breaking Bones and Building Knowledge: A Context-Based Lab for Exploring Beam Bending
Anne-Marie Ginn-Hedman (Texas A&M University, USA)
Detailed Program – Saturday, October 21st

Krista M. Kecskemety, Laine E Rumreich and Bob Rhoads (The Ohio State University, USA)

10:00 – 11:30
WIP-30: Professional Development #6 [WIP]
Room: MSC 2404

Industry’s Expectations of Graduate Dispositions
Natalie Kiesler (DIPF Leibniz Institute for Research and Information in Education, Germany); John Impagliazzo (Hofstra University, USA)

Mind Maps: an alternative to improve quality and communication during the requirements engineering process
Luiz Carlos Begosso (Fundacao Educacional Do Municipio de Assis & Faculdade de Tecnologia de Assis, Brazil); Luiz Ricardo Begosso (Fundacao Educacional Do Municipio de Assis, Brazil); Fernanda Salvalaggio (Colchoes Castor, Brazil); Regiane Lealdine (Unimed Brazil, Brazil); Kamila Aparecida Vicente (Faculdade De Tecnologia De Ourinhos, Brazil); Carlos Alberto Furlan (Faculdade de Tecnologia de Ourinhos, Brazil)

Mentoring Undergraduate Researchers through Entrepreneurial Mindset
Anastasia Rynearson and Christina A. Pantoja (Campbell University, USA)

Best Practices for Cultivating Innovative Thinking Skills in Innovation Competitions and Programs
Abdullah Konak and Sadan Kulturel-Konak (Penn State Berks, USA); David R. Schneider (Cornell University, USA); Khanjan Mehta (Lehigh University, USA)

Reflections on Ethics Education and Professional Preparation among New-to-the-Workforce Engineers
Dean Nieusma, Kylee N Shiekh, Lucy Gilbert-Fagen and Julianne Stevens (Colorado School of Mines, USA)

10:00 – 11:30
WIP-31: Curriculum and Course Development #8 [WIP]
Room: CORPS I

Introducing Quantum Computing in a Sophomore Signals and Systems Course
Chao Wang and Aradhita Sharma (Arizona State University, USA); Glen Uehara, Leslie Miller and Deep Pujara (Arizona State University & SenSIP Center, USA); Wendy Barnard and Jean Larson (Arizona State University, USA); Andreas Spanias (ASU / SenSIP Center / School of ECEE, USA)

Cybersecurity in ECE curriculum, an expanded collaboration program to disseminate real security experiences in cyber-physical systems
Virgilio Gonzalez (University of Texas at El Paso, USA); Oscar A Perez (US ARMY-DEVCOM, USA); Rodrigo Romero (University of Texas at El Paso, USA)
Detailed Program – Saturday, October 21st

Designing an Educational Cyber-Physical System Based on a Model-Based Approach
Yong-Kyu Jung (Gannon University, USA); Julie Ropelewski (Instructional Designer, USA); Sherri L Gould (Outcomes Assessment Project Coordinator, USA)

Development of a Virtual Reality Application for Oculomotor Examination Education
Austin Finlayson, Rui Wu, Chia-Cheng Lin and Brian Sylcott (East Carolina University, USA)

Core curriculum development in Intelligent Connectivity: Integration of subjects 5G and IoT with AI
Dragorad Milovanovic (University of Belgrade, Serbia); Vladan Pantovic (University Union - Nikola Tesla, Serbia)

From breadboard to complex electronic systems - introducing a heterogenous group of undergrad students to design and analysis of electronic circuits
David Riehl, Ferdinand Keil and Klaus Hofmann (Technische Universität Darmstadt, Germany)

10:00 – 11:30

WIP-32: Curriculum and Course Development #9 [WIP]
Room: CORPS II

Developing Experiential Learning Opportunities for Undergraduate Cyber Security Engineering Students Based in IoT Security: A Work in Progress Report
Megan K Ryan and Julie A. Rursch (Iowa State University, USA)

Work in Progress (Research Category): Exploring Strategies for Infusing DEI Principles Into Undergraduate Engineering Classrooms for Engineering School and Institutional Change
Kimberly Cook-Chennault (Rutgers, the State University of New Jersey, USA)

Exploring the Multi-Strata Knowledge Structures in STEM Education
Gang Liu (University of Pittsburgh at Bradford, USA)

A recommender system for machine learning pipelines’ design to recognize objects in video frames as a learning tool for training data scientists
Alexey Dukhanov and Artem Alekseevich Smetanin (ITMO University, Russia); Anna Lutsenko (University ITMO, Russia)

WIP: Development of a Student-Centered Personalized Learning Framework to Advance Undergraduate Robotics Education
Ponkoj C Shill (University of Nevada, Reno, USA); Rui Wu (East Carolina University, USA); Hossein Jamali (University of Nevada Reno, USA); Bryan Hutchins (University of North Carolina Greensboro, USA); Sergiu Dascalu (University of Nevada Reno, USA); Frederick C. Harris and David Feil-Seifer (University of Nevada, Reno, USA)
Detailed Program – Saturday, October 21st

Work in Progress: Mind and skill sets for Innovation: Preparation for a Rapidly Changing World
M Cynthia Hipwell and Hadear I Hassan (Texas A&M University, USA); Luis Rodriguez (Texas A&M University, USA); Rujun Gao, Karan Watson and Astrid Layton (Texas A&M University, USA); D. Chris Seets (Texas A&M University, USA)

10:00 – 11:30
WIP-33: Computing #7 [WIP]
Room: HULLABALOO

Focus on Early Misconceptions in the Use of Variables and the Assignment Operator to Facilitate Progress in Learning Computer Programming
Candido Cabo (New York City College of Technology/City University of New York, USA)

Developing and Documenting Problem-Solving Strategies for Computer Programming Before Code Writing
Candido Cabo (New York City College of Technology/City University of New York, USA)

Exploring the Potential of Large Language Models to Generate Formative Programming Feedback
Natalie Kiesler (DIPF Leibniz Institute for Research and Information in Education, Germany); Dominic Lohr (Friedrich-Alexander University Erlangen-Nuremberg, Germany); Hieke Keuning (Utrecht University, The Netherlands)

A scalable approach to support computer science students in their learning and preparation as software engineers
Sathya Narayanan (California State University, Monterey Bay, USA); Leslie Maxwell, Mariana Anita Garcia and Utsab Saha (California State University Monterey Bay, USA); Tyler Menezes (CodeDay, USA)

Identification of Threshold Concepts for Intermediate Computer Science Students
Brian M. McSkimming (University of Oklahoma, USA); Sean Mackay and Adrienne Decker (University at Buffalo, USA)

10:00 – 11:30
WIP-34: Professional Practice #5 [WIP]
Room: OAK

Designing a Toolkit for Dissemination
Kathleen E Cook (Seattle University, USA); Jennifer Turns (University of Washington, USA); Yen-lin Han, Greg Mason and Teodora Rutar Shuman (Seattle University, USA)

Communication and management: key pieces in the consolidation of companies in Public Institutions of Higher Education.
Lisseth Gil Guerrero and Rosa Maria Valles Ruiz (Autonomus University of Hidalgo State, Mexico)
Detailed Program – Saturday, October 21st

**New Perspectives on Observing Newton's Rings**  
Ming-Feng Lu (Beijing Institute of Technology & Beijing Key Laboratory of Fractional Signals and Systems, China); Jin-MIn Wu (Beijing Information Science and Technology University, China); Wenming Yang (Shanghai Jiao Tong University, China); Feng Zhang and Ran Tao (Beijing Institute of Technology, China)

**Enculturation of Students to Engineering and COVID's Impact Associated**  
Noemi Mendoza (Texas A&M, USA); Allison Esparza (TEXAS A&M UNIVERSITY, USA); Karen Rambo-Hernandez (Texas A&M University, USA); Bimal Nepal (USA)

**Exploration and Research on the Open and Shared New Engineering Maker Practice Education**  
Zhibo Sun and Zhihong Li (Beihang University, China); Zheng Qian (Bei Hang University, China); Haitao Qi and Chengkun Shi (Beihang University, China)

| 10:00 – 11:30 | **WIP-35: Diversity and Broadening Participation #7 [WIP]**  
*Room: ROSS I*

*Investigating the predictive relationship of grade point average (GPA) on engineering students' enrollment in entrepreneurial education programs: A Decision Tree Analysis*  
Prateek Shekhar, Tarique Hasan Khan, Sanjeet Gajjar and Heather Duff (New Jersey Institute of Technology, USA)

*Spaces and Practices within University Makerspaces*  
Madison E Andrews and Audrey Boklage (University of Texas at Austin, USA)

*Work-in-Progress Paper: Using active learning educational software to improve Hispanic students learning at an HSI*  
Anna Stepanova (Texas A&M University, USA); Saira Anwar (Texas A&M University, USA); Tracy Hammond (Texas A&M University, USA)

**Seeking Alignment: Exploring Underrepresented Minority Students' Motivations to Pursue Doctoral Degrees in Engineering**  
Abimelec Mercado Rivera (Arizona State University, USA); Marta L Cano and Eduardo Rodriguez (Rowan University, USA); Mayra Artiles Fonseca (Arizona State University, USA); Juan M Cruz (Rowan University, USA); Holly Matusovich (Virginia Tech, USA); Stephanie Adams (University of Texas Dallas, USA)

| 10:00 – 11:30 | **WIP-36: Diversity and Broadening Participation #8 [WIP]**  
*Room: ROSS II*

*Using Collaborative Autoethnography to Investigate Engineering Journeys*  
Diana A. Chen, Gordon Hoople and Susan M. Lord (University of San Diego, USA); Joel Alejandro Mejia (The University of Texas at San Antonio, USA)
Detailed Program – Saturday, October 21st

A Summer Introductory Programming Course with Diversity Awareness
Isabela Ortiz (Uniandes, Colombia); Kelly Garcés (Universidad de Los Andes, Colombia); Jaime Torres (Uniandes, Colombia); Ali Malik (Stanford University, Colombia); Alejandro Espinal (Universidad del Norte, Colombia)

Theoretical perspectives from organizational psychology on the role of family-work balance in women's departure from the engineering profession
Christina A. Pantoja (Campbell University, USA); Joyce B. Main (Purdue University, USA)

A Peer-to-Peer Guide on Academic Transformation in Research-to-Practice of STEM Learners that Promote Project Accessibility for Community Impact
Willie L. Brown, Jr (University of Maryland Eastern Shore, USA)

Development of a Situational Judgment Inventory for Marginalized Student Support
Malini M Josiam, Artre Turner and Walter C. Lee (Virginia Tech, USA)

Dimensions of Equity: Undergraduate Research through Vertically Integrated Projects at Five Institutions
Julia Sonnenberg-Klein (Georgia Institute of Technology, USA); Jack Bringardner (New York University, USA); Edward Coyle (Georgia Institute of Technology, USA); Robert Kukta (Stony Book University, USA); Donna Llewellyn (Boise State University, USA); Nichole Ramirez and Carla B. Zoltowski (Purdue University, USA)

Experiences of Two Exemplar Women with Coping Self-Efficacy during Undergraduate Engineering
Rawle D. Sookwah and Sona Gholizadeh (University of South Carolina, USA)

10:00 – 11:30
WIP-37: K12 STEM Education #6 [WIP]
Room: EAGLE

Exploring Early Computer Science Education: Beliefs, Attitudes and Perceptions within Project-based and Extracurricular Learning Approaches
Jacob Robbins (Texas A&M University, USA); Stephanie Philipp and Lauren Strickland (University of Tennessee at Chattanooga, USA)

Developing a tool for the assessment of systems thinking in K-12 settings
Malle R Schilling and Jacob Grohs (Virginia Tech, USA)

Adventure Alongside AI into STEM Education
Sydney O Singer, Benjamin J Haines and Mehdi Roopaei (University of Wisconsin - Platteville, USA)

Developing aerospace pathways through K12 community science activities
Wilhelm Friess (University of Maine, USA); Seth W Campbell (University of Maine & Foundation for Glacier & Environmental Research, USA); Karl Kreutz (University of Maine, USA); Barbara Stewart (Bangor High School, USA)
Detailed Program – Saturday, October 21st

10:00 – 11:30
WIP-38: Attitudes and Perceptions #3 [WIP]
Room: REVEILLE I

Beyond Summer Reading: Enabling Covert Student Learning Through a Cross-Campus Connecting Theme
Laura Fiss and Brett Hamlin (Michigan Technological University, USA); Heather Love (University of Waterloo, USA); Linda Ott, Charles Wallace and Steven Walton (Michigan Technological University, USA)

Early prediction of first-term math grades using demographic and survey data
Pamela Bilo Thomas (University of Louisville, USA); Campbell R. Bego (University of Louisville & J. B. Speed School of Engineering, USA); Arinan Dourado and Xiaomei Wang (University of Louisville, USA)

Characterizing How Engineering Undergraduate Students Define and Develop Data Proficiency
Godwyll Aikins (Florida Institute of Technology Melbourne, USA); Catherine Berdanier (Pennsylvania State University, USA); Kim-Doang Nguyen (Florida Institute of Technology, USA)

10:00 – 11:30
WIP-39: Attitudes and Perceptions #4 [WIP]
Room: REVEILLE II

The Impact of an Innovation Education Program on Alumni Entrepreneurial and Innovation Self-Efficacies
Kei Hysi, Sheri Sheppard, Helen L. Chen and George Toye (Stanford University, USA); Hana Milanov (Technical University of Munich, Germany)

Work-in-Progress: A Study of Chemical Engineering Student Biases Regarding Teamwork and DEI Issues across the Curriculum
Richard T Cimino (New Jersey Institute of Technology, USA)

The Effect of a Mastery Learning Course on Rafael's Mindset
Carlos L Perez and Dina Verdin (Arizona State University, USA)

Impact and Experiences of an Engineering Professor becoming a Student while Teaching
Jennifer Hasler (Georgia Institute of Technology, USA)

Robotics Innovative Technologies and Education (RITE) Lab: A multi-disciplinary Human-Robot Interaction (HRI) Lab
Ashraf Gaffar and Mohamed Y. Selim (Iowa State University, USA)

Physical Software Design: An Innovative Instructional-Based Method Using Project-Based Learning
Ashraf Gaffar and Mohamed Y. Selim (Iowa State University, USA)
Detailed Program – Saturday, October 21st

10:00 -11:30
WIP-40: Attitudes and Perceptions #5 [WIP]
Room: TRADITIONS

Computational vision for analyzing student emotions in e-Learning: a preliminary Study
Marcos Devaner Nascimento (Universidade de São Paulo, Brazil); Francisco Oliveira, Victor Wilker dos Santos de Oliveira, Rondinelli Moura Machado and Mitchel Bomfim (Universidade Estadual do Ceará, Brazil); Adson Roberto P Damasceno (Ceara State University, Brazil)

Interpersonal and Intrapersonal Factors Associated with Academic Belonging of Engineering Graduate Students
Olanrewaju Paul Olaogun and Nathaniel Hunsu (University of Georgia, USA); Denise R. Simmons (Virginia Polytechnic Institute and State University, USA); Isaac D Dunmoye (University of Georgia, USA)

Using Vignettes to Elicit Students' Understanding of Dispositions in Computing Education
Renée McCauley (College of Charleston, USA); Mihaela Sabin (University of New Hampshire, USA); Amruth N. Kumar (Ramapo College of New Jersey, USA); Bonnie MacKellar (St. John's University, USA); Natalie Kiesler (DIPF Leibniz Institute for Research and Information in Education, Germany); John Impagliazzo (Hofstra University, USA); Rajendra Raj (Rochester Institute of Technology, USA)

Conforming and Non-Conforming Motivations and Behaviors in Students' Holistic Learning Journeys
Vaani Bhatnagar, Adhishri Hande, Prisha Bhatia and Yevgeniya V Zastavker (Olin College of Engineering, USA)

Work-in-Progress: Exploring Student Learning Outcomes During a Ghana Learning Abroad Experience
Daniel W Burleson, Jerrod A Henderson and Maggie Mahoney (University of Houston, USA)

Measuring engineering culture: a preliminary approach using perceptions of meritocracy and competition
Matilde Sánchez-Peña and Syed Ali Kamal (University at Buffalo, USA); Nichole Ramirez (Purdue University, USA)

12:00 - 12:40
PST: Poster Session and Grab & Go Lunch
Room: A&M Hotel Century Ballroom

Assessment during the pandemic COVID-19
Ela Zur (The Open University of Israel, Israel); Tamar Vilner (The Open University of Israel, Israel)

Infusing Culturally Responsive Instruction with Gamification: Early Findings from an Engineering Design Activity for High School Migratory Youth
Dina Verdin and Ulises J Trujillo Garcia (Arizona State University, USA)
Work in Progress (Research Category): How do online student engagement analytics relate to course performance in online and in-person engineering laboratory environments?
Kimberly Cook-Chennault and Ahmad Farooq (Rutgers, the State University of New Jersey, USA)

Exploration on how to slow down students' learning curve in experimental teaching through freshman technical training
ShanShan Li (Tsinghua University, China)

ABET Outcome Impact Analysis of Online Versus On-campus Software Engineering Students During COVID-19
Kevin Gary and Douglas Sandy (Arizona State University, USA)

Emulating Industry Practices in Computer Science Classrooms
Tajmilur Rahman and Joshua Nwokeji (Gannon University, USA)

Towards Deep-Learning Text Classifiers for Formative Assessment Based Diagnostics
Wassim Mahfouz and Heinz- Dietrich Wuttke (Technische Universität Ilmenau, Germany)

Using Teamwork in an In-person Class in the Decline of the Pandemic
Mohamed Zaghloul (The University of Pittsburgh, USA); Amr Hassan (University of Pittsburgh, USA)

A Laboratory in Machine Learning for Electrical Microgrid Courses using Real Data
Roxana Melendez-Norona and Maria M. Larrondo-Petrie (Florida Atlantic University, USA)

Navigating Complex Collaboration Boundaries in Engineering Education: Exploration of Students' Experiences
Anuli Ndubuisi, James Slotta, Elham Marzi and Philip Asare (University of Toronto, Canada)

A Vertically Integrated Projects Model for Multi-Institution and Multi-Discipline Undergraduate Research in Radio Frequency AI/ML
Alyse M Jones (Virginia Tech & National Security Institute, USA); Sonya Dennis (Morehouse College, USA); Colleen Bartos (Virginia Tech, USA); Amos Johnson (Morehouse College, USA); Alan J Michaels (Virginia Tech & Hume Center for National Security and Technology, USA); William C Headley (Virginia Tech, USA)

Private Blockchain Platform and Consensus Algorithm Labs for Undergraduate Level
Emil Salib (James Madison University, USA)

Biological Information Representation to Support Engineering Students' Ability to Think "Outside the Box"
Hadear I Hassan and Astrid Layton (Texas A&M University, USA)

Critical Success Factors of Student Success in the Construction Engineering and Management Program
Jeyoung Woo (California State Polytechnic University, Pomona, USA); Jinsung Cho, Yasser Salem, M. Ron Yeung and Ghada M. Gad (California State Polytechnic University Pomona, USA)
Detailed Program – Saturday, October 21st

An Educational Modeling Software Tool That Teaches Computational Thinking Skills Through STEM Classes
Dominika Bobik, Pradnya Pendse, Katie H Ulinski, Trevor X Petrin, Rhys W Brockenshire and Leo C. Ureel II (Michigan Technological University, USA)

Women Self-Authoring Engineering Identity from the Bottom-Up
Rick Evans (Cornell University & College of Engineering, USA); Mojdeh Asadollahipajouh (University of Nebraska-Lincoln, USA); Stacey Kulesza (Texas State University, USA); Jia Liang (Kansas State University, USA); Grace Panther (University of Nebraska-Lincoln, USA)

Peer-to-Peer Engagement using Project Based Learning for NASA Design Concepts with 3D Printing Makerspace Development to Support Pre-College Engineering Education and Innovation at an HBCU
Willie L. Brown, Jr and Etahe Johnson (University of Maryland Eastern Shore, USA)

Financial Education: Bibliometric Analysis from 1989 to 2023
Ery Tri Djatmika and Madziatul Churiyah (Universitas Negeri Malang, Indonesia)

Predicting Student Outcomes Through Artificial Intelligence for Intervention in Aerospace and Mechanical Students
Caroline Salas, Angel Flores-Abad, Meagan R. Kendall and Miguel Cedeno (University of Texas at El Paso, USA); Louis Everett (UTEP, USA)

A Quantitative Approach: Computer Science Path for Muslim vs Non-Muslim Female Students
Maral Kargarmoakhar and Monique Ross (Florida International University, USA)

Perceived capabilities of Arduino-like systems by engineering students and faculty
Maria-Isabel Carnasciali, Christopher J Martinez and Francis Pellicano (University of New Haven, USA)

Modern technology usage in Mathematical education in schools Grade (1-9)
Khaula Zeeshan (University of Jyvaskyla, Finland); Timo Hämäläinen and Pekka Neitaaanmäki (University of Jyväskylä, Finland)

Ensuring Quality in Assessments
Divya Nalla (Nalla Malla Reddy Engineering College, India)

Competency Analysis in Computer Science and Engineering: The State of the Art
Joshua Nwokeji, Tejas Veeraganti Manjunath and Tajmilur Rahman (Gannon University, USA)

Dual-Form Mentoring: Addressing the Disparity of Hispanics in the STEM Workforce
Annalisa Perez, Diane E. Golding and Helen Geller (University of Texas at El Paso, USA)

War and Education: How Russian Invasion Impact STEM Education in Ukraine
Joshua Nwokeji (Gannon University, USA); Ayodele Olagunju (University of Saskatchewan, Canada); Purevdorj Enkhjargal (Gannon University, USA)
Detailed Program – Saturday, October 21st

Faculty Training - learning by doing approach
Divya Nalla (Nalla Malla Reddy Engineering College, India)

Critical Thinking Multimodal Assessment Feedback in Entrepreneurship and Innovation
Mário Minami (Federal University of ABC & Information Engineering, Brazil); Celso Setsuo Kurashima (Federal University of ABC (UFABC), Brazil)

The effects of formative assessment on students’ attitude toward learning, grade achievement and design skills: Perspectives from a sophomore-level digital logic design-based course
Muhammad Zilany (Texas A&M University at Qatar, Qatar)

Characterizing and Supporting Thriving Neurodivergent Engineering Students
Julianna Gesun (University of New Hampshire, USA)

Philosophizing to Create
Melany M Ciampi (Safety, Health and Environment Research Organization & President, Portugal); Claudio R Brito (Science and Education Research Organization, Portugal)

Improving Equity, Diversity, and Inclusion at Canadian Engineering Programs: With What Data?
Philip Asare and Siva Sivaramakrishnan (University of Toronto, Canada)

Assessing Engineering Judgment
Marie Stettler Kleine and Dean Nieusma (Colorado School of Mines, USA)

Sustaining quality in teaching learning - an institutional perspective
Divya Nalla (Nalla Malla Reddy Engineering College, India)

Artificially Intelligent Agents in VR Military Training
Matthew Montebello (University of Malta, Malta)
### PST-3: [STUDENT PANEL] Students’ Perspective of Post-Affirmative Action: Implication and Consequence of Higher Education

**Room:** ROSS I

**Panel Title:** Students' Perspective of Post-Affirmative Action: Implication and Consequence of Higher Education

Siqing Wei (Purdue University, USA); Jerry Yang (Stanford University, USA); Rachel Figard (Arizona State University, USA); Marcus Vinicius Melo de Lyra (Ohio State University, USA)

### PST-4: [STUDENT PANEL] Navigating New Horizons: Exploring Graduate Students' Transitions to Engineering Education

**Room:** ROSS II

**Panel Title:** Navigating New Horizons: Exploring Graduate Students' Transitions to Engineering Education

Atayliya N Irving (University of Florida, USA); Jeremy A. M. Waisome (University of Florida, USA)

### PST-5: [STUDENT PANEL] From Campus to Community: Nurturing Global Leadership in Student Engineers

**Room:** CORPS I

**Panel Title:** From Campus to Community: Nurturing Global Leadership in Student Engineers

Chase Johnson (Texas A&M University, USA), Jessica V Williams (Texas A&M University, USA)

**Description:** The transition from undergraduate life to the complex world is a significant one. For student engineers who’ve taken on leadership roles during their college years, the challenges and opportunities that lie ahead in the global engineering environment can be both exciting and daunting. This panel brings together student leaders taking an engineering course load to discuss the tools, experiences, and curricula that best prepare them for leadership in the diverse, global engineering industry. It includes insights on how to encourage leadership development both in and out of the classroom.

**Sub-topics to be Covered:**
- Leadership in Practice: Reflections on how student leadership roles in college serve as mini-incubators for the challenges of leading diverse teams in global corporations.
- Balancing Technical and Soft Skills: The role of academic curricula in fostering not just engineering skills, but also communication, collaboration, and cultural sensitivity.
- Building Networks Early: Leveraging college leadership roles to establish professional relationships, international collaborations, and mentorships which are essential in the global engineering landscape.
- Understanding the Global Context: Experiences from student-led international projects, exchanges, or collaborations that have provided a foundational understanding of engineering challenges and solutions from a global perspective.
• Mentorship and Guidance: The importance of finding and learning from mentors who’ve successfully transitioned from student leaders to industry leaders.
• Service in Engineering Identity: Building a sense of civic engagement as part of engineering and encouraging community service in all its forms.
• Ethical Leadership: The role of ethics in leadership, especially in engineering projects that impact diverse communities around the world.
• Charting the Path Forward: Advancing Ethics, Civics, and Cultural Competence.
• Adapting to Rapid Change: Insights into how student leaders adapt to rapidly changing technologies and methodologies while considering cultural and global implications.
• Recommendations for Academic Institutions: What additional support, training, or experiences would student leaders recommend to institutions to better prepare the next generation of engineers for leadership roles in a global context?
• By focusing on these sub-topics, the panel can provide valuable insights for educators, institutions, and industry representatives on how to develop engineers who build technologies for social good in a diverse, global engineering world.

12:00 – 12:40
PST-9: [STUDENT PANEL] Estimating Multisensorial Experiences: Designing and Implementing a Multimodal Lab
Room: CORPS II

Estimating Multisensorial Experiences: Designing and Implementing a Multimodal Lab
Edwin Marte Zorrilla, Gadhaun Aslam, Naqash Gerard, Idalis Villanueva Alarcón and Isabella Victoria (University of Florida, USA)