IEEE

SAUS 2024

IEEE SOUTH ASIAN ULTRASONICS SYMPOSIUM

27-29 March 2024 || Indian Institute of Technology (IIT) Gandhinagar, Gujarat, India

IEEE SOUTH ASIAN ULTRASONICS SYMPOSIUM 2024
CONFERENCE PROGRAM

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Welcome Message from the General Chairs

We are delighted to host you at the inaugural IEEE South Asian Ultrasonics Symposium (SAUS)! This event creates a confluence of research minds from the South Asian region and from across the globe. The South Asian region is home to the world's youngest population. Hence, the future of our research community will be determined in part by the researchers from this region, who work not only in this geographic region, but across the world. Recognizing the scope and need to offer exposure to budding researchers from the South Asian region, the UFFC Society has been generous in approving the conduct of SAUS 2024 as a special outreach international symposium.

The program committee has put together an excellent series of invited and contributed talks and posters that showcases cutting-edge innovations in ultrasonics. The highlight being a conscious effort to have no parallel sessions/tracks to enhance cohesiveness and interaction. This first symposium is being organized at the Indian Institute of Technology (IIT) Gandhinagar, one of the 23 IITs, which are institutions of national importance in India. The organizing committee of this event includes members from other IITs and other leading institutions. Gandhinagar and Ahmedabad together form a major educational and economic hub. These cities are located 25 kilometers apart and share an airport. This region combines the comfort of a planned capital city (Gandhinagar) with the excitement of a bustling UNESCO world heritage city (Ahmedabad). We hope that along with the conference activities, you also have the chance to explore the tourist attractions that Gujarat and other parts of India have to offer. As you may be aware, this region has several sites of historical, architectural, and cultural significance. The symposium provides ample room for interactions through a variety of events beyond the technical program. We hope that those attending in person, will also appreciate the regional cuisine, culture, and performances.

We thank you for your participation in the inaugural SAUS meeting. Without your support and enthusiasm, it would not have been possible to organize a meeting at this scale with participation from academics, clinicians, and industry. We thank the leadership of the IEEE UFFC Society for sponsoring SAUS and their assistance in the organization. We gratefully acknowledge our sponsors whose financial contributions enabled us to keep the registration and tutorial fees reasonable for all attendees and also supported technical and social events. We also value their interactions with attendees about the latest products and innovations available in this domain. Our special thanks to Verasonics/MELSS and General Electric Healthcare who supported us at the Platinum level, Precision Acoustics/Kingsly Instrumentation at the Gold level, and the Focused Ultrasound Foundation, Vermon, us4us, and TPAC NDT at the Silver level. Supersonic Imagine provided the student awards sponsorship. We thank the members of our organizing committee for their efforts. Special thanks go out to Claire Folkerts from Conference Catalysts in supporting us and keeping us on track!

We hope that you will have a delightful and productive all-around experience at SAUS 2024!

IEEE SAUS 2024 General Chairs

Arun K. Thittai, Indian Institute of Technology Madras (India)
Himanshu Shekhar, Indian Institute of Technology Gandhinagar (India)

Welcome Message from the Technical Program Chairs

On behalf of the Technical Program Committee, we are excited to welcome you to the inaugural edition of IEEE SAUS at the Indian Institute of Technology Gandhinagar. SAUS 2024 will have an exciting three-day scientific program featuring 45 podium presentations and 60 poster presentations in the areas of medical ultrasonics, nondestructive evaluation, industrial applications, physical acoustics, and transducer design. SAUS features 4 keynote talks and 9 invited talks from distinguished academic researchers and clinicians in the field. Three pre-conference tutorials will be held on 26th March, focusing on themes such as ultrasound wave propagation, simulations, imaging and artificial intelligence.

The SAUS 2024 scientific program was developed through a rigorous double-blind peer-review process. The 45 podium presentations were selected from 93 original submissions, and the 60 posters were selected from 48 original submissions and 28 late-breaking abstract submissions.

IEEE SAUS 2024 is being conducted in a hybrid format. In-person attendees will experience the symposium at the Indian Institute of Technology Gandhinagar campus. Meanwhile, virtual participants will have access to the CONFlux platform, which offers the ability to view presentations and posters in real-time or on-demand, as well as the opportunity to engage with fellow attendees.

The SAUS 2024 program will include best student podium presentation and poster awards to celebrate excellence and encourage budding student researchers. The symposium will feature a series of professional development events organized by the Students, Young Professionals, and Women in Engineering Committee. These events will include sessions on entrepreneurship and the art of responding to peer review. Additionally, participants can look forward to a student social gathering, a mentorship lunch, and a networking event. Moreover, an immersive cultural experience will be provided, allowing attendees to engage with the local traditions and partake in the vibrant dance forms of Gujarat, India.

We thank you for extending your support by participating in the inaugural edition of SAUS. We express our sincere gratitude to the reviewers who conducted a thorough evaluation of the submissions and offered valuable feedback to the authors. We look forward to you having an enriching and engaging experience at SAUS 2024!

IEEE SAUS 2024 Technical Program Co-Chairs

Karla P. Mercado-Shekhar, Indian Institute of Technology Gandhinagar (India)

Mahesh R. Panicker, Singapore Institute of Technology (Singapore)

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Program-at-a-Glance

Time (IST)	Pre-conference tutorials - 26th March		Day 1 - 27th March	Day 2 - 28th March	Day 3 - 29th March
7:30 AM	Breakfast				
8:00 AM	**Tutorial 1:** From acoustic field equations to imaging and fullwaveform inversion (Instructor: Prof. Koen van Dongen) - Academic Block 1/102 (8:00-10:00 AM)	Breakfast	Breakfast	Breakfast	Breakfast
8:30 AM					
9:00 AM			**Tutorial 1:** From acoustic field equations to imaging and fullwaveform inversion (Instructor: Prof. Koen van Dongen) - Academic Block 1/102	**Oral session 4 (Therapeutic Ultrasound II)**, 1.5 h: Invited Talk 1 (**Ayache Bouakaz**), Contributed 4 talks (9:00 AM - 10:30 AM) - Academic Block 1/101	**Oral session 6 (Transducers and Materials)**, 1.5 h: Contributed 6 talks (9:00 - 10:30 AM) - Academic Block 1/101
9:30 AM					
10:00 AM	Tea/Coffee break (10:00-10:15 AM)		**Welcome session** (10:00 AM - 10:30 AM) - Academic Block 1/101		
10:30 AM	**Tutorial 1:** From acoustic field equations to imaging and fullwaveform inversion (Instructor: Prof. Koen van Dongen) - Academic Block 1/102 (10:15 AM-1:00 PM)	**Tutorial 2:** Mastering Ultrasound Imaging with Field II: A Comprehensive Tutorial by Dr. Deep Bera (10:30 AM - 1:00 PM) - Academic Block 1/101	**Keynote talk 1: F. Levent Degertekin** (10:30 - 11:15 AM) - Academic Block 1/101	**Keynote talk 3: Suresh Seshadri** (10:30 - 11:15 AM) - Academic Block 1/101	**Keynote talk 4: Christy Holland** (10:30 - 11:15 AM) - Academic Block 1/101
11:15 AM			Tea/Coffee break (11:15-11:30 AM)	Tea/Coffee break (11:15-11:30 AM)	Tea/Coffee break (11:15-11:30 AM)
11:30 AM			**Oral session 1 (Physical Acoustics, NDE, Sensors)**, 1 h, 45 min: Invited 1 talk (**Krishnan Balasubramaniam**), Contributed 5 talks (11:30 AM - 1:15 PM) - Academic Block 1/101	**Clinical session**, 1 h, 20 min: Invited talks 4 (**Drs. K Vijayan, Vikas Vazhayil, Vishal Raval, and Chandan Das**) (11:30 AM - 12:50 PM) - Academic Block 1/101	**Oral session 7 (Therapeutic Ultrasound III)**, 1.5 h: Invited 1 talk (**Ashish Ranjan**), Contributed 4 talks (11:30 AM - 1:00 PM) - Academic Block 1/101
12:00 PM					
12:30 PM					
1:00 PM	Lunch (1:00 - 2:00 PM) Area outside of Jasubhai Auditorium			Lunch/ YP+WIE session (12:50 - 2:00 PM) - Area outside of Jasubhai Auditorium	Lunch (1:00 PM - 2:00 PM) - Area outside of Jasubhai Auditorium
1:30 PM			Lunch/ YP+WIE session (1:15 - 2:15 PM) - Area outside of Jasubhai Auditorium		
2:00 PM	**Tutorial 1:** From acoustic field equations to imaging and fullwaveform inversion (Instructor: Prof. Koen van Dongen) - Academic Block 1/102 (2:00-5:00 PM)	**Tutorial 3:** Artificial Intelligence in Ultrasound Imaging by Dr. Navchetan Awasthi (2:30 PM - 5:00 PM) - Academic Block 1/101	**Oral session 2 (Therapeutic Ultrasound I)**, 1.5h: Invited 1 talk (**Chrit Moonen**), Contributed 4 talks (2:15 PM - 3:45 PM) - Academic Block 1/101	**Oral session 5 (Diagnostic Imaging and AI)**, 2.5 h: Invited 1 talk (**Phaneendra Yalavarthy**), Contributed 8 talks (2:00 PM - 4:30 PM) - Academic Block 1/101	**Oral session 8 (Photoacoustics & Vascular flow imaging)**, 2 h: Contributed 8 talks (2:00 PM - 4:00 PM) - Academic Block 1/101
2:30 PM					
3:00 PM					
3:30 PM					
4:00 PM			**Keynote talk 2: Kullervo Hynynen** (3:45 - 4:30 PM) - Academic Block 1/101		
4:30 PM			Tea/Coffee break (4:30 - 4:45 PM)		**Poster session** (Flash talks - Academic Block 1/101, Srujan open space - Poster interactions) + Exhibits + Tea/Coffee break (4:00 - 6:30 PM)
5:00 PM	YP+WIE session: Entrepreneurship, **Chintan Oza** - Academic Block 1/102 (5:30-6:30 PM)		**Oral session 3 (Image Analysis & Elastography)**, 1.5 h: Contributed 6 talks (4:45 PM - 6:15 PM) - Academic Block 1/101	**Poster session** (Flash talks - Academic Block 1/101, Srujan open space - Poster interactions) + Exhibits + Tea/Coffee break (4:30 - 7:00 PM)	
5:30 PM					
6:00 PM					
6:30 PM	**Student Social** - Area outside of Jasubhai Auditorium (6:30-8:00 PM)		YP+WIE session: **Christy Holland**, Responding to Peer Review (6:15 - 7:30 PM) - Academic Block 1/102		**Closing/ Awards session** (6:30-7:00 PM) - Academic Block 1/101
7:00 PM					
7:30 PM			**Gala Dinner** – Guest House Lawn (7:30-10:00 PM)	**Cultural performance** - Kanisa Auditorium (7:30-8:30 PM) **Dinner** - Darpan Fountain Area (8:30-9:30 PM)	
8:00 PM					
8:30 PM					
9:00 PM					
9:30 PM					

Keynote Speakers

Kullervo Hynynen
Sunnybrook Health Sciences Centre

MRI-guided Focused Ultrasound for Nonivasive Brain Treatments
When paired with MRI-guidance, focused ultrasound (FUS) can target mechanical energy into deep-seated anatomical or physiological sites within the body. This focused energy application can alter tissue function through either thermal or mechanical interactions. Introducing micron-sized gas bubble contrast agents alongside FUS further enhances this approach by locally increasing blood vessel wall permeability, facilitating improved diffusion of drugs from the bloodstream into specific tissues. Experimental studies on animals have validated the efficacy of this technique in enhancing the permeability of the blood-brain barrier, thereby augmenting drug effectiveness in preclinical models. Various therapeutic agents, including chemotherapy drugs, antibodies, viral vectors, nanoparticles, and cellular treatments, have undergone successful testing in these preclinical disease models. Moreover, multiple clinical trials have demonstrated the modulation of the blood-brain barrier permeability in humans, with the treatments proving safe and showcasing improved drug delivery along with initial signs of treatment efficacy. This presentation will delve into recent advancements in this field, highlighting the achieved progress and exploring the potential future directions for this promising approach.

F. Levent Degertekin
Georgia Tech

CMUT Based Systems with Applications Ranging from Intravascular to Transcranial Ultrasound
Based on silicon micromachining technology and taking advantage of electronics integration, CMUT technology is gradually finding its place in medical ultrasound applications. Large 2D CMUT arrays with integrated CMOS electronics (CMUT-on-CMOS) have recently enabled commercialization of low-cost handheld ultrasound systems with 3D imaging capability operating in the 1-10MHz range. In this talk, we explore several applications broadening the potential impact of the technology. We first describe the CMUT technology and discuss its key advantages such as bandwidth and tunability as well as its limitations in terms of pressure output and nonlinearity. We then provide examples of our research where we exploit miniaturization and electronics integration for catheter-based intravascular ultrasound (IVUS), and tunability and low-noise electronics for transcranial focused ultrasound (tFUS) for microbubble assisted blood brain barrier (BBB) opening. Specifically, we describe a 1.11mm2 CMUT-on-CMOS chip for side looking IVUS with 16 element array and plane wave transmit beamforming capability at 40MHz, in addition to a forward-looking volumetric imaging IVUS CMUT-on-CMOS array at 20MHz. We then focus on our work on a low frequency CMUT based tFUS system for BBB opening applications where we developed integrated electronics for low noise CMUT receivers for microbubble dynamics monitoring and demonstrated CMUT based tFUS transmission for microbubble excitation with phase modulation for reduced nonlinearity in the 0.4-0.8 MHz range. These examples indicate the feasibility of CMUT based systems for medical applications beyond handheld ultrasound.

Christy Holland
University of Cincinnati

Ultrasound Image-guided Catheter-directed Therapies to Treat Cardiovascular Disease
Peripheral arterial disease (PAD) represents a challenging clinical problem affecting 15–20% of people over 70 years of age due to the diffuse nature of atheroma deposition throughout the arterial bed. Management of PAD with angioplasty and bare metal stents is complicated by restenosis. Studies of drug eluting stents in PAD have reported disappointing long-term results. An innovative strategy using ultrasound-enhanced delivery of a catheter-directed pioglitazone (PGN) to prevent the buildup of additional plaque in the intervention area, reduce inflammation in the surrounding atheroma bed, and promote healthy blood flow will be discussed. Fibrin-targeted echogenic liposomes loaded with PGN were characterized before and after infusion through EKOS catheters (Boston Scientific, Maple Grove, MN, USA). Effervescent bubble activity (cavitation) was nucleated and sustained by Definity® or fibrin-targeted, PGN-loaded echogenic liposomes infused and insonified with EKOS catheters. Though the EKOS catheter was not designed specifically for cavitation nucleation, infusion of echo contrast agents can be employed to trigger and sustain bubble activity for enhanced intravascular drug delivery. Other applications of ultrasound-enhanced drug delivery using the EKOS catheter include sonothrombolysis. Mechanisms for ultrasound enhancement of drug delivery, with a special emphasis on acoustic cavitation, will be reviewed. Further preclinical and clinical studies are needed to correlate the amount and type of cavitation with drug penetration into vascular tissue or thrombi with therapeutic effect.

Keynote Speakers

Suresh Seshadri
Mediscan Systems

Artificial Intelligence in Fetal Medicine

Over the last 4 years significant strides have been made in the field of imaging. The use of AI in the field of radiology has significantly developed in recent years, particularly in the diagnosis of chest, liver, thyroid and breast diseases. The journey of AI in obstetric ultrasound has just begun. Fetal mobility, changing fetal anatomy with gestational age, and obtaining large datasets of specific anatomical planes and artifacts in images are some of the challenges that need to be overcome while preparing training datasets. Inter and intraobserver variability in real time ultrasound adds another layer of difficulty to fix the "ground truth".

The main objectives of AI in Obstetric ultrasound are:
  a)   To automate fetal biometry
  b)   To identify standard anatomical planes in the fetus and check for normalcy
  c)   To identify suspicious abnormal patterns
  d)   To reduce scanning time
  e)   To provide a method for standardizing performance in low resource settings where expertise is not available

 Currently commercially available AI techniques include automation of biometry and prediction of gestational age, automatic identification of the standard anatomical fetal planes. Identification of the three standard head planes from an acquired 3D volume of the head, biometry and labelling helps reduce scanning time significantly. "Smart spine" and "Smart Face" features helps in identifying abnormalities in these structures more confidently. AI technology is now able to identify and freeze the appropriate images during the targeted scan in the second trimester. It has been demonstrated in a study of image quality assessment, deep convolutional networks fared better than 3 expert medical doctors. The future of AI in obstetric ultrasound holds a lot of promise as we explore new areas to make the ultrasound machine more "intelligent" which will help to serve communities in remote areas of the world and help women to go through pregnancies safer.

Invited Speakers

Ayache Bouakaz
University De Tours

Ultrasound and Microbubbles for Anticancer Drug Delivery: From Physics to Clinics

Ultrasound (US) in combination with gaseous microbubbles has come into focus as a potential new drug delivery technology. Indeed, beyond their exploitation for diagnosis, microbubbles and US, today represent an emerging technology for localized drug delivery. Recent research shows that under the action of US waves, microbubbles transiently perforate biological barriers (e.g . cell membrane, endothelial barrier) thus leading to the uptake and enhanced accumulation of drugs in the targeted region. Hence, the bioavailability of therapeutic agents is sitespecifically augmented only in the zone where the US waves are focused. Commonly referred to as sonoporation, it offers real promises as a drug delivery tool with potential of alleviating the limitations encountered by traditionally available therapeutic arsenal.

Ashish Ranjan
UT Southwestern Medical Center

Chemo-immunotherapy of Solid Tumors with Focused Ultrasound and Nanomedicines
Focused ultrasound (FUS) is a clinically relevant therapeutic technology that delivers spatially accurate mechanical stress and heating to solid tumors, avoiding collateral toxicity to healthy tissues. FUS also has the potential to promote immunogenic recognition and clearance of tumor cells by the immune system. Our research demonstrates that FUS-induced local heating and stress, combined with nanoparticles, can modify the tumor microenvironment to yield several benefits, including enhanced solid cancer chemotherapy, release of tumor antigens, and stimulation of antitumor immunity compared to conventional therapies. In this seminar, I will discuss the concepts and techniques for drug delivery and immunomodulation, providing examples of clinical translation in canine cancer treatment.

Chrit Moonen
Focused Ultrasound Foundation, USA

Focused Ultrasound Histotripsy Combined with Immune Checkpoint Inhibition for the Treatment of Advanced Cancer: From Preclinical Research to Phase I Clinical Trial
Immune Checkpoint Inhibition (ICI) has led to improved survival for some cancers yet failed to demonstrate benefit in others. Limited efficacy of ICI is seen in 'cold tumors', characterized by a paucity of T cells. Converting cold tumors into hot tumors could improve the efficacy of ICI. A promising technique is (boiling) histotripsy (HT). HT results in mechanical fractionation of tissue, rapid tissue lysis, release of tumor-associated antigens and danger-associated molecular patterns (DAMPS). Together with the Children's National Medical Center and the NIH, we have shown that HT worked synergistically with ICI in a neuroblastoma animal model leading to increased survival, abscopal and vaccination effects (Eranki et al. CCR 2020). HT caused upregulation of dendritic cells, tumor infiltrating T-cells, proinflammatory cytokines, and DAMPs, while reducing pro-tumor regulators such as regulatory T-cells.
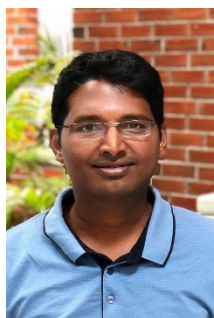
Phaneendra Yalavarthy
Indian Institute of Science, Bengaluru

Navigating Challenges in Artificial Intelligence based Ultrasound Image Analysis
Ultrasound imaging has become an important point of care of modality for medical diagnosis due to its non-invasive nature and real-time imaging capabilities. As artificial intelligence (AI) continues to revolutionize healthcare, integrating AI into ultrasound image analysis presents both opportunities and challenges. This talk aims to explore the multifaceted challenges in the development of AI tools for ultrasound image analysis. Variability in image quality, noise, and artifacts inherent in ultrasound scans poses a significant obstacle for AI algorithms aiming for accuracy and reliability. Furthermore, the need for robust AI models capable of handling anatomical variations and change in depth of focus adds complexity to the development process. Standardized data sets, including ground truth (expert annotations) availability limits quick development of supervised AI models. Much needed deployment of these AI models for online analysis during the ultrasound scan is also a serious challenge to make AI appealing for ultrasound image analysis.

Invited Speakers

Vishal Raval
L. V. Prasad Eye Institute

Ocular Ultrasound: Past, Present, and Future
Ocular B-mode ultrasonography (US) is an important adjuvant tool for the clinical diagnosis and prognosis of various retinal and choroidal lesions. It has become widely used because it can easily be performed at the bedside with a relatively small apparatus and does not expose the patient to any ionizing radiation. Although this technique has seen widespread acceptance in other fields such as cardiology, obstetrics, and gynecology, its general use in ophthalmology has been somewhat limited. The current application of USG in ophthalmology is in patients with media opacities to see posterior segment pathologies such as vitreous hemorrhage, retinal detachment, and foreign body. It also plays an important role in the diagnosis of tumors (e.g., choroidal melanoma, metastases, hemangioma) by documenting tumor size, location, and internal reflectivity. In this talk, I will focus on current applications of ultrasound in ophthalmology, challenges ahead, recent advances, and a few unanswered research questions to brainstorm.

Vikas Vazhayil
National Institute of Mental Health and Neurosciences, Bengaluru

Ultrasound in Brain Surgery-for Preservation and Destruction
Brain tissue is unique in terms of texture and material properties. The nature of tissue, physiological importance, high blood supply are formidable factors for consideration for surgery. Brain surgery has evolved only over the past century. The current practise of micro neurosurgery established more than half a century ago has dramatically improved outcomes following brain surgery.

K Vijayan
Royal Care Super Specialty Hospital

MR Guided Focused Ultrasound Lesioning: Not an Axon More Not a Neuron Less
This talk will share experiences with the cutting-edge technology of MR-guided Focused Ultrasound, in the Indian context.

Chandan Das
All India Institute of Medical Sciences

Application of Sono Elastography in Clinical Practice
The process of elastography allows one to quantify any tissue's hardness in kilopascals. Since an ultrasound machine is typically used to produce elastography waves, this technique is frequently referred to as sonoelastography. Sonoelastography is typically produced using two methods: shear wave elastography (SWE) and acoustic radiation force impulse (ARFI) elastography. In clinical practice, both of these methods are employed to quantify stiffness. Elastography is most frequently utilized in the diagnosis of cancer because malignant tissue is frequently hard. This causes it to become more stiff, and one can determine whether or not there is a soft tissue lesion by measuring the stiffness.

Krishnan Balasubramaniam
Indian Institute of Technology Madras

Asset & PROCESSS Integrity Monitoring: Guided ULTRASONIC WAVES JOURNEY
Asset Integrity and Process Monitoring technologies have a logical impact on operational costs. Efficiencies realized by effectively managing labor, inventory and other support services directly impact the bottom line by helping to control costs. More timely and precise user intervention can improve productivity, reduce materials use and decrease the cost of doing business.

Tutorials

Koen Van Dongen
Delft Institute of Technology, the Netherlands

From Acoustic Field Equations to Imaging and Full-Waveform Inversion
To optimize your ultrasound imaging device, to understand your data, or to improve your imaging algorithm; it is always important to have a good understanding of how acoustic wave fields propagate in the medium. To get this understanding, it is essential to have knowledge about the physical mechanisms and mathematical formulations that describe wave propagation in the heterogenous medium. This course is about the fundamentals of acoustic wave theory and imaging and inversion. During this course, the acoustic field equations will be derived and linearized to derive the wave equation for linear acoustics. Next, different solution methods for modelling acoustic waves in heterogeneous media will be explained. Finally, the concepts behind Kirchhoff integrals, Rayleigh integrals, evanescent waves as well as the ideas behind imaging and (non-linear) inversion for quantitative imaging will be explained.

Deep Bera
Samsung Research India Bangalore

Ultrasound Imaging with Field II: A Comprehensive Tutorial
This tutorial provides an in-depth exploration of Field II, a powerful ultrasound simulation software. Participants will gain hands-on experience in creating realistic ultrasound simulations, understanding transducer properties, and optimizing imaging parameters. The tutorial covers essential aspects of Field II, empowering users to enhance their proficiency in ultrasound simulation for various applications, from medical imaging to non-destructive testing.

Navchetan Awasthi
University of Amsterdam

Artificial Intelligence in Ultrasound Imaging
In the tutorial on AI for ultrasound imaging, participants embark on a comprehensive exploration of the synergies between artificial intelligence (AI) and ultrasound imaging. Starting with an insightful overview of ultrasound basics and applications, the tutorial delves into AI's transformative role in addressing unique challenges inherent to ultrasound imaging. Foundational principles of AI and machine learning form the basis for understanding their application in medical imaging, emphasizing the crucial role of high-quality data in training AI models tailored for ultrasound. The tutorial deepens with an exploration of AI techniques, particularly the application of deep learning architectures in ultrasound imaging, supported by compelling case studies showcasing advancements and successes. Practical considerations become focal points, as the tutorial navigates through challenges, opportunities, and ethical considerations tied to deploying AI in ultrasound. Real-world applications and a live demonstration offer a tangible illustration of AI's impact on diagnostic capabilities, enhancing participant understanding. The tutorial culminates in a forward-thinking discussion on future trends, allowing participants to glimpse into the evolving landscape of AI in ultrasound imaging. Overall, the tutorial equips attendees with comprehensive insights into the present and future landscape of AI in enhancing ultrasound diagnostics.

Student, Young Professional, and Women In Engineering Events

Entrepreneurship in India - A talk by Mr. Chintan Oza
Title: Why it's right time to start a startup in India
Date and time: 26th March, 5:30 - 6:30 PM
Location: Academic Block 1/102

Chintan Oza, Founder of Anantam Ecosystems and Regional Director at Founder Institute, brings 24 years of intrapreneurship in tech and startups. An alumnus of IIT Mumbai, UC Berkeley, and Oxford University, he's recognized by NASDAQ and completed Georgia Tech's Innovation and Tech Commercialization certification. With Reliance and Tata Group, he led telecom projects globally. As Founder Institute's Mumbai leader, he's mentored 320+ entrepreneurs across 6 continents. Chintan's articles are featured in journals, and he authored books under World Bank Project. Actively volunteering in PMI, IEEE, and more, he advises startups, invests, and serves on VC investment committees. As IEEE Entrepreneurship's India Region Lead, he organizes virtual events. He's a Council Member for Startup20 under G20 and co-founded IEEE's Quantum Information Tech workgroup. Chintan also spoke at BRICS Innovation Forum and UAE's COP28 Summit. Connect on LinkedIn.

Abstract: India's booming economy and growing tech talent are creating a goldmine for entrepreneurs. Join us as we explore the exciting opportunities in the Indian startup ecosystem. Discover why government initiatives, increased funding access, and a young, tech-savvy population make India the perfect launchpad for your innovative idea. Learn from inspiring favorable parameters and get the mentoring you need to turn your entrepreneurial dream into reality!

Student Social: Join us for a fun-filled evening to super-charge yourself before the conference with fun activities and ice-breaker events. Open to all students.
Date and time: 26th March, 6:30 - 9:00 PM
Location: Area outside Jasubhai Auditorium

Mentorship Lunch: Connect with mentors from academia and industry in a formal round table discussion luncheon. Seize this unique opportunity to connect with experts in the field, gain invaluable advice, and foster mentorship relationships that can propel your career forward. - Open to all participants.
Date and Time: 27th and 28th March,1:00 - 2:00 PM
Location: Area outside Jasubhai Auditorium

Responding to scientific peer review: by Prof. Christy K. Holland
Date and time: 27th March, 6:15 - 7:30 PM
Location: Academic Block 1/102

Join us for this educational session addressing the best practices of responding to scientific peer review. Gain insights into effectively addressing critiques, refining research, and enhancing the rigor of scientific inquiry. Open to all participants.

Abstract: Peer review is the cornerstone of scientific publishing. Diversity of perspectives is an integral part of a successful vetting process. The editor, associate editors, and reviewers who examine each manuscript are the authors' peers: persons with comparable standing in the same research field as the authors themselves. Peer review contributes to improving the quality of a published paper, ensures previous work is properly acknowledged, highlights the importance and novelty of the findings, detects plagiarism and fraud, and promotes academic career development. Reviewers help by providing a comprehensive analysis of the abstract, introduction and background, methodology, results and discussion, conclusion, references, tables and figures. Good reviewers provide a detailed and timely report supporting statements regarding whether the research is original, novel, and important to the field of biomedical ultrasound. Reviewers provide a clear recommendation whether the paper should be accepted for publication, requires minor or major modifications, or rejected altogether with no opportunity to revise. Tips for navigating the peer review system, responding to critiques, and revising manuscripts for resubmission will be discussed.

Technical Program, Wednesday, March 27

11:30 - 13:15
Oral Session 1: Physical Acoustics, NDE, Sensors
Session Chair: Krishnan Balasubramaniam (Indian Institute of Technology Madras, India), Koen Van Dongen (TU Delft, The Netherlands)

11:30 - Invited talk: Krishnan Balasubramaniam

12:00 - Full Waveform Inversion for transcranial ultrasound tomography using freely available modelling software: Initial experience
Sumit Kumar Yadav (Indian Institute of Technology Madras, India); Tushar R (Indian Institute of Technology, Madras, India); Arun K Thittai (Indian Institute of Technology Madras, India)

12:15 - Innovative Transfer Matrix Approach for Simulating Pulse-Echo Interactions in Complex Interfaces
Mounir Tafkirte, Adil Hamine, Hicham Mesbah and Mohamed Ettahiri (Ibn Zohr University, Morocco)

12:30 - Effective packaging of PZT on Silicon microcantilever submerged in liquids for fluid property sensing
Javed Nadindla, Akshay Kumar and Pavitra Jain (Indian Institute of Science, India); Sudhanshu Tiwari (Purdue University, India); Rudra Pratap (Indian Institute of Science Bangalore, India); Gayathri Pillai (IISc Bangalore, India)

12:45 - Identifying Li-ion battery defects using Ultrasound Technique
Bhuvanesh Palanivelu (IIT Madras & Azeriri Pvt Ltd, India); Nishal Ramadas (Azeriri Private Limited, India)

13:00 - Resonant Pressure Sensor for Harsh Environment using Piezoelectric Micromachined Ultrasound Transducer
Sahana D (Indian Institute of Science, India); Praveen Kumar and Chandrashekar L N (IISc, India); Antony Jeyaseelan A and Manjunatha Nayak (Indian Institute of Science, India); Rudra Pratap (Indian Institute of Science Bangalore, India); Gayathri Pillai (IISc Bangalore, India)

14:15 - 15:45
Oral Session 2: Therapeutic Ultrasound I
Session Chair: Kenneth B Bader (University of Chicago, USA), Avinash Eranki (Indian Institute of Technology Hyderabad, India)

14:15 - Invited Talk: Chrit Moonen

14:45 - A Comparative Study of histotripsy parameters for the Treatment of Fibrotic Ex-vivo Human Benign Prostatic Hyperplasia Tissue
Yashwanth Nanda Kumar (University of Washington & Center for Industrial and Medical UItrasound, USA); Zorawar Singh, Adam D Maxwell, Yak-Nam Wang, Diboro Kanabolo, Lucas Chen and Matthew Bruce (University of Washington, USA); Rishi Sekar (University of Michigan, USA); Eli Vlaisavljevich (Virginia Polytechnic Institute and State University, USA); Lawrence True and George R Schade (University of Washington, USA)

15:00 - Ultrasound Wave Propagation and Shear Stress through Tissues for Intercostal Focused Ultrasound Therapy
Aniket Sabale (IIT HYDERABAD, India); Viswanath R R S R Chinthapenta and Suhail Rizvi Mohd (IIT-Hyderabad, India); Avinash Eranki (Indian Institute of Technology Hyderabad, India)

15:15 - Vascular recanalization using histotripsy with and without thrombolytic therapy in a porcine model of venous thrombosis
Kenneth B Bader (University of Chicago, USA)

15:30 - Gold nanoparticle-coating reduces acoustic pressure threshold for nanodroplet vaporization
Nishitakumari Prafulchandra Mistry and Ruchika Dhawan (Indian Institute of Technology Gandhinagar, India); Karla Mercado-Shekhar (IIT Gandhinagar, India)

16:45 - 18:15
Oral Session 3: Image Analysis & Elastography
Session Chair: Manish Bhatt (IIT Guwahati, India), Libertario Demi (University of Trento, Italy)

16:45 - Quantifying Textural Heterogeneity of Ultrasound Images in Breast Fibroadenomas
Megha R (IIT Hyderabad, India); Geetha Priya and Selvi Radhakrishna (Chennai Breast Centre, India); Avinash Eranki (Indian Institute of Technology Hyderabad, India)

17:00 - Development of multiparametric ultrasound map using an integrated system and method to assess hepatic steatosis
Lokesh Basavarajappa (IIT Indore, India); Mawia Khairalseed and Kenneth Hoyt (Texas AM University, USA)

17:15 - Breast Tumor Heterogeneity Quantification using 3D Ultrasound Texture
Megha R (IIT Hyderabad, India); Geetha Priya and Selvi Radhakrishna (Chennai Breast Centre, India); Avinash Eranki (Indian Institute of Technology Hyderabad, India)

17:30 - Assessing the Confounding Effect of Vascularity on Viscoelastic Parameters using Shear Wave Visco-elastography - A Phantom Study
Jayashree Karmakar and Ruchika Dhawan (Indian Institute of Technology Gandhinagar, India); Karla Mercado-Shekhar (IIT Gandhinagar, India)

17:45 - Characterizing the shear wave attenuation of viscoelastic phantoms
Sapna Bisht (Indian Institute of Technology Gandhinagar, India); Bhanu Prasad Marri (IIT Gandhinagar Alumni, India); Karla Mercado-Shekhar (IIT Gandhinagar, India)

18:00 - Towards a Simple Method for Estimating Muscle Fatigue Using B-mode Ultrasound Imaging
Ria Rajendra Rajput, Manikandan Shenbagam and Biswarup Mukherjee (Indian Institute of Technology Delhi, India)

Technical Program, Thursday, March 28

9:00 - 10:30
Oral Session 4: Therapeutic Ultrasound II
Session Chair: Lokesh Basavarajappa (IIT Indore, India), Maxime Lafond (INSERM, France)

9:00 - Invited Talk: Ayache Bouakaz

9:30 - Investigation of Non-Invasive Temperature Estimation Using Adaptive Strain Estimator for Hyperthermia Treatment Monitoring
Muthu Rattina Subash Ramu, Arun K Thittai and Kavitha Arunachalam (Indian Institute of Technology Madras, India)

9:45 - Synthesis of Ultrasound Sensitive Bovine Serum Albumin Nanosystem for On Demand Release of Camptothecin in Triple Negative Breast Cancer Cell lines
Sajmina Khatun (IIT Hyderabad, India); Seethalakhmi Ak (Indian Institute of Technology Hyderabad, India); Chandralekha Putta (IIT Hyderabad, India); Aravind Kumar Rengan (Indian Institute Of Technology Hyderabad, India)

10:00 - Cavitation nucleation in the crystalline lens
Clément Foullounoux, Alice Ganeau, Cyril Lafon and Maxime Lafond (INSERM, France)

10:15 - Tumor drug delivery and ablation combined platform using low frequency insonation of nanobubbles
Mike Bismuth and Tali Ilovitsh (Tel Aviv University, Israel)

14:00 - 16:30
Oral Session 5: Diagnostic Imaging and AI
Session Chair: Biswarup Mukherjee (Indian Institute of Technology Delhi, India), Debdoot Sheet (Indian Institute of Technology Kharagpur, India)

14:00 - Invited Talk: Phaneendra Yalavarthy

14:30 - CUDA-GPU Implementation Strategies for non-linear Beamforming for Synthetic Transmit Aperture Technique: Initial Results
Lokesh Basavarajappa (IIT Indore, India); Arun K Thittai (Indian Institute of Technology Madras, India)

14:45 - A Wearable Device for Simultaneous Muscle Assessment with Real Time Ultrasound (SMART-US) During Dynamic Activity
Erica L King and Ahmed Bashatah (George Mason University, USA); Brian M Guthrie (Goerge Mason Univerity, USA); Margaret T Jones, Qi Wei, Siddhartha Sikdar and Parag V Chitnis (George Mason University, USA)

15:00 - Maternal Fetal Ultrasound Planes Classification using Contrastive Language Image Pre-training Models
Bhuma Chandra Mohan (Bapatla Engineering College, India)

15:15 - Investigation of coded excitation in advanced synthetic aperture technique for ultrasound imaging
Tushar R (Indian Institute of Technology, Madras, India); Arun K Thittai (Indian Institute of Technology Madras, India)

15:30 - The p-th coherence factor weighted delay-add-sum beamforming for passive cavitation imaging using sparse arrays
Abhinav Kumar Singh (Indian Institute of Technology Gandhinagar, India); Kenneth B Bader (University of Chicago, USA); Himanshu Shekhar (Indian Institute of Technology Gandhinagar, India)

15:45 - Adaptive Coherence Factor method based on Dominant Mode Rejection Beamformer for Ultrasound Plane Wave Imaging
Zacarias Fernando Nharongue Secane and Acácio Zimbico (DEEL, Eduardo Mondlane University); Fabio Schneider and Joaquim Maia (CPGEI, Federal University of Technology - Paraná - Brazil)

16:00 - Point-of-care Ultrasound for cardiac biomarker
Biswabandhu Jana (ABV-IIITM Gwalior, India); Pradyut Kumar Sanki (SRM University-AP, India); Ashraf Talaat Youssef (MBBCH, Egypt); Mahua Bhattacharya (ABV-IIITM, Gwalior (MP) India, India)

16:15 - SonoNeuro: A Multimodal, Co-Located Ultrasonic Electromyography Sensor for Neuromuscular Activity Sensing
Kavita Sharma, Anne Tryphosa Kamatham and Biswarup Mukherjee (Indian Institute of Technology Delhi, India)

16:30 - 19:00
Poster Session 1
Session Chair: Parag V Chitnis (George Mason University, USA)

16:30 - External Absorbers mediated thermal therapy and Optoacoustic Spectral sensing for advanced cancer therapeutics
Deblina Biswas (Dr B R Ambedkar National Institute of Technology Jalandhar, India); Swarup Roy (Lovely Professional University, India)

16:32 - Correlation of Escherichia coli Inactivation with Histotripsy Bubble Cloud Size
Pratik Ambekar, Tatiana Khokhlova, Pavel Rosnitskiy, Yak-Nam Wang, Daniel Leotta, Gilles Thomas and Thomas Matula (University of Washington, USA)

16:34 - Ultrasound Image Segmentation to Delineate Histotripsy Ablation
Kenneth B Bader (University of Chicago, USA)

16:36 - Impact of Altered Shell and Gas Compositions on the Material Properties of Microbubbles
Mehmet Yapar, Roozbeh Hassanzadeh Azami and Kausik Sarkar (George Washington University, USA)

16:38 - Ultrasound triggered release of Curcumin for the breast cancer therapy
Buddhiraju Hima Sree and Jagapathi Rao Maddila (Indian Institute of Technology Hyderabad, India); Aravind Kumar Rengan (Indian Institute Of Technology Hyderabad, India)

16:40 - Tuning Cancer Therapeutics Effectiveness Through Ultrasound Mediated Melanin-Chlorin e6-Polydopamine Nanoparticles
Ajinkya Madhukar Thanekar (Indian Institute of Technology, Hyderabad, India); Vinod Ravasaheb Shinde (Indian Institute of Technology Hyderabad, India); Sajmina Khatun (IIT Hyderabad, India); Buddhiraju Hima Sree (Indian Institute of Technology Hyderabad, India); Aravind Kumar Rengan (Indian Institute Of Technology Hyderabad, India)

16:42 - Ultrasound Triggerd Sonodynamic Therapy for the Treatment of Melanoma (B16)
Dheeraj Dehariya (Indian Institute of Technology, India); Kavipriya Murugaiyan and Deeksha Trivedi (Indian Institute of Technology Hyderabad, India); Aravind Kumar Rengan (Indian Institute Of Technology Hyderabad, India)

16:44 - Ultrasound-triggered lipid-coated Iohexol-carbon dots for 4T1 cancer cells treatment
Vinod Ravasaheb Shinde (Indian Institute of Technology Hyderabad, India); Sajmina Khatun (IIT Hyderabad, India); Ajinkya Madhukar Thanekar (Indian Institute of Technology, Hyderabad, India); Aravind Kumar Rengan (Indian Institute Of Technology Hyderabad, India)

16:46 - Evaluation of a rhenium glycosylated complex as sonosensitizer for inactivation of E. coli in vitro
Abhishek Jha and Nishitakumari Prafulchandra Mistry (Indian Institute of Technology Gandhinagar, India); Anu Janaagal, Manita Das, Roshni Kerai, Dhiraj Bhatia and Iti Gupta (IIT Gandhinagar, India); Himanshu Shekhar (Indian Institute of Technology Gandhinagar, India)

16:48 - Effect of the therapy pulse duration on the performance of passive cavitation imaging: A simulation study
Himanshu Shekhar and Abhinav Kumar Singh (Indian Institute of Technology Gandhinagar, India)

16:50 - Hyperelastic Strain Elastography to Measure Subcutaneous Adipose Tissue Thickness: A Simulation Study
Sameer Kumar Gautam (Indian Institute of Science Bangalore, India); Manish Arora (Indian Institute of Science, India)

16:52 - Improving shear wave speed map reconstruction in ultrasound elastography using deep learning algorithm

Phidakordor Sahshong (Indian Institute of Technology, Guwahati, India); Manish Bhatt (IIT Guwahati, India)

16:54 - Quantifying the effect of transducer F-number, focal depth, and tissue viscosity on Scholte wave-induced bias in shear wave elastography: A numerical study

Abhijit Paul and Karla Mercado-Shekhar (IIT Gandhinagar, India)

16:56 - Characterizing Ultrasound-based Shearwave Propagation in Collagen Fiber Network

Shradha Suman Panda (India); Dhruba Jyoti Mech (IIT Hyderabad, India); Avinash Eranki (Indian Institute of Technology Hyderabad, India & IIT, India); Suhail Rizvi Mohd (IIT-Hyderabad, India)

16:58 - 3D Finite Element Study of Multi-frequency Harmonic Shear Wave Elastography (HSWE) for Stiffness Contrast Quantification with Experimental Validation

Tuhin Roy and Elisa Konofagou (Columbia University, USA)

17:00 - Effect of fiber orientation on shear wave elastography estimates: In silico and experimental studies using a novel muscle phantom

Akash Chandra (Indian Institute of Technology Gandhinagar (IIT Gandhinagar), India); Karla Mercado-Shekhar (IIT Gandhinagar, India)

17:02 - Performance Evaluation of Beam Multiply and Sum Beamforming with Coherent Plane Wave Compounding: In-vitro Results

Anilakkad N. Madhavanunni (Indian Institute of Technology Palakkad, India); Mahesh Raveendranatha Panicker (Singapore Institute of Technology, Singapore)

17:04 - The pth standard deviation factor-weighted delay-and-sum beamforming for needle visualization in B-mode ultrasound images

Abhinav Kumar Singh, Jagruti M Patil and Himanshu Shekhar (Indian Institute of Technology Gandhinagar, India)

17:06 - Sparse array implementation of synthetic aperture focusing technique with pth-root beamforming for nondestructive testing applications

Shaswata Das, Abhinav Kumar Singh and Himanshu Shekhar (Indian Institute of Technology Gandhinagar, India)

17:08 - Sparse Ultrasound Imaging-based Simultaneous Two-Degrees-of-Freedom Wrist and Hand Function Estimation

Manikandan Shenbagam, Anne Tryphosa Kamatham, Pradeeba Sridar and Biswarup Mukherjee (Indian Institute of Technology Delhi, India)

17:10 - On the Performance Investigation of Diverging-Wave-Based Vector Doppler Imaging with Linear Arrays: In-silico Results

Anilakkad N. Madhavanunni (Indian Institute of Technology Palakkad, India); Mahesh Raveendranatha Panicker (Singapore Institute of Technology, Singapore)

17:12 - Super-Resolution Imaging at sub-100 Hz frame rates by means of a Novel Radial Basis Interpolation Technique

Giulia Tuccio, Sajjad Afrakhteh and Libertario Demi (University of Trento, Italy)

17:14 - Differentiation of Intraocular Tumors using Nakagami Envelope Statistics on Radiofrequency (RF) Data: Initial Results

Sakshi Hitesh Oza (Indian Institute of Technology, Gandhinagar, India); Jagruti M Patil (Indian Institute of Technology Gandhinagar, India); Vishal Raval (L V Prasad Eye Institute, India); Karla Mercado-Shekhar (IIT Gandhinagar, India)

17:16 - Characterizing Male Baldness and Female Pattern Hair Loss via Scalp and Hair Testing, and Ultrasound Envelope Statistics: A Pilot Study
Jagruti M Patil and Hari Nair (Indian Institute of Technology Gandhinagar, India); Parth Joshi (Cliantha Research Limited Ahmedabad, India); Sushant Murudkar (Marico Ltd Mumbai, India); Himanshu Shekhar (Indian Institute of Technology Gandhinagar, India); Karla Mercado-Shekhar (IIT Gandhinagar, India)

17:18 - Suppressing Streak Artifacts Generated by the Interference of Imaging and Therapy Fields: Initial findings using a Hybrid U-Net and Diffusion Model
Mihir Agarwal (Indian Institute of Technology, Gandhinagar, India); Shreyans Jain, Ruchika Dhawan, Nishitakumari Prafulchandra Mistry and Himanshu Shekhar (Indian Institute of Technology Gandhinagar, India)

17:20 - On the Echogenicity of Natural Starch-Based Blood Mimicking Fluids for Contrast Enhanced Ultrasound Imaging: Preliminary In-vitro Experiments
Arun Kumar V and Anilakkad N. Madhavanunni (Indian Institute of Technology Palakkad, India); Nivetha S (Vivekanandha College of Engineering for Women, India); Mahesh Raveendranatha Panicker (Singapore Institute of Technology, Singapore)

17:22 - PVA based Anatomical Phantom of Rat Liver for Ultrasound Imaging
Abhishek Kumar and Debdoot Sheet (Indian Institute of Technology Kharagpur, India)

17:24 - Pilot Study on Tissue-Mimicking Phantoms for Optimization of Low-Cost Photoacoustic Microscopy
Mridul Verma (Indian Institute of Technology Hyderabad, India); Renu John (Indian Institute of Technology, India)

17:26 - Gold-Coated Phage Nanosomes For Ultrasound Mediated Breast Cancer Therapeutics
Dokkari Nagalaxmi Yadav, Sunil Venkanna Pogu and Sri Amruthaa Sankaranarayanan (IIT Hyderabad, India); Aravind Kumar Rengan (Indian Institute Of Technology Hyderabad, India)

9:00 - 10:30
Oral Session 6: Transducers and Materials
Session Chair: Siddharth Tallur (Indian Institute of Technology, Bombay, India)

9:00 - Design and Fabrication of a Piezoelectric Micromachined Ultrasound Transducer using Aluminum Nitride: Initial Characterization Results
Anujkumar Dayaram Prajapati and Apurva Dahake, and Arjun B s (Indian Institute of Science, Bangalore, India); Himanshu Shekhar (Indian Institute of Technology Gandhinagar, India); Hardik J. Pandya (Indian Institute of Science Bangalore, India)

9:15 - Experimental Validation of a Fabrication Approach Using Intermediate Insulator Layer for Ultrasonic Transducers
Chandrashekar L N, Sahana D, Praveen Kumar, Antony Jeyaseelan A, and Gayathri Pillai (IISc Bangalore, India)

9:30 - Low Power, Superior-Resolution Handheld Ultrasound Imaging System for Point of Care Applications
Banhimitra Kundu (Indian Institute of Science, India); Shabbir Amjhera Wala (Texas Instruments, India); Chetan Singh Thakur (India, India); Chandra Sekhar Seelamantula (Indian Institute of Science, India)

9:45 - Evaluation of Piezoelectric Transducer Vibration and Mechanical Failure Under High Power Pulsed Output
Yashwanth Nanda Kumar (University of Washington & Center for Industrial and Medical Ultrasound, USA); Ga Won Kim, Ekaterina Kuznetsova and Wayne Kreider (University of Washington, USA); Oleg Sapozhnikov (Moscow State University and University of Washington, Russia); Timothy L. Hall (University of Michigan, USA); Adam D Maxwell (University of Washington, USA)

10:00 - A new scheme for 3D ultrasound imaging with custom design FPGA based high-speed data acquisition system
Samir Kumar Biswas, Pratap Khuntia and Tejprakash Sharma (Indian Institute of Science Education and Research Mohali, India); Bhavuk Sharma (Punjab Engineering College Chandigarh, India); Nagendra Singh (IISER Mohali, India); Jyoti Kedia (Punjab Engineering College, India); Sriram Krishnan (Indian Institute of Science Education and Research Mohali, India)

10:15 - MEMS-Based Rheological Profiling in Breast Cancer with Diabetes
Sri Harsha Paladugu (Indian Institute of Science, Bengaluru, India); Kishan Bharadwaj (Indian Institute of Science, India); Annapoorni Rangarajan (Indian Institute of Science, Iran); Rudra Pratap (Indian Institute of Science Bangalore, India)

11:30 - 13:00
Oral Session 7: Therapeutic Ultrasound III
Session Chair: Cyril Lafon (INSERM, France)

11:30 - Invited Talk: Ashish Ranjan

12:00 - Study of the impact of ultrasonic inertial cavitation on the stiffness of pancreatic tumors in spheroids and murine model
Cyril Lafon, Maxime Lafond, Adrien Rohfritsch and Gabrielle Laloy Borgna (INSERM, France); Gilles Renault (Institut Cochin, France); Litan Wang, Jacqueline Ngo and Magali Perier (INSERM, France); Frédéric Prat (Institut Cochin, France)

12:15 - Comparison of nonlinear imaging-derived bubble cloud size estimates with histotripsy treatment zone in vitro
Vishwas Trivedi (Indian Institute of Technology Gandhinagar, India); Kenneth B Bader (University of Chicago, USA); Himanshu Shekhar (Indian Institute of Technology Gandhinagar, India)

12:30 - Ultrasound Responsive Multi-Layered Emulsions for Drug Delivery
Aaqib Haroon Khan, Sapna Bisht, Nishitakumari Prafulchandra Mistry, Karla Mercado-Shekhar, and Sameer V Dalvi (Indian Institute of Technology Gandhinagar, India)

12:45 - Volumetric nanodroplets-enhanced ultrasound surgery combined with immunotherapy as a cancer therapy platform
Bar Glickstein and Tali Ilovitsh (Tel Aviv University, Israel)

Technical Program, Friday, March 29

14:00 - 16:00
Oral Session 8: Photoacoustics & Vascular Flow Imaging
Session Chair: Ratan Kumar Saha (Indian Institute of Information Technology Allahabad, India)

14:00 - Development of a class of photoacoustic agents for theranostic applications
Ananya Sharma (Indian Institute of Science (IISc), Bengaluru, India); Ananya Banerjee, Vinay V, Pooja Annasaheb Patkulkar and Soumyashree Sahoo (IISc Bengaluru, India); Sanhita Sinharay (Indian Institute of Science, India)

14:15 - Exploring Photoacoustics from Optical Activity: A Perspective for Biomolecular Sensing
Swathi Padmanabhan and Jaya Prakash Jp (Indian Institute of Science, India)

14:30 - An experimental investigation on in-vitro blood clot formation using multi-wavelength photoacoustics
Subhadip Paul (IIIT ALLAHABAD, India); Zartab Khanam and Mainak Roy (Indian Institute of Information Technology Allahabad, India); Hari Shankar Patel (Raja Ramanna Centre for Advanced Technology, India); Vatsala Misra (Moti Lal Nehru Medical College, KGMU, India); Ravi Rani (KGMU, India); Amaresh Kumar Sahoo and Ratan Kumar Saha (Indian Institute of Information Technology Allahabad, India)

14:45 - Enhancing Photoacoustic Imaging through eC-IntC-SAFT-CF: A Comprehensive Approach for Improved Resolution and Contrast
Deepayan Samanta (IISER Tiruvananthapuram, India); Arijit Paramanick (Indian Institute of Science Education and Research Thiruvananthapuram, India); Suhesh Kumar Singh (IISER Trivandrum, India); Piyao Narumbam (Indian Institute of Science Education and Research Thiruvananthapuram, India)

15:00 - Unveiling Subwavelength Vascular Detail using Empirical Mode Decomposition for Super-Resolution ultrasound Imaging
Debabrata Ghosh (Thapar Institute of Engineering & Technology, India); Kenneth Hoyt (Texas AM University, USA)

15:15 - Liver microvascular flow evaluation by texture analysis and quantitative contrast-enhanced ultrasound in pediatric chronic liver disease
Laith R Sultan, Shyam SB Venkatakrishna, Trudy Morgan and Morgan Gabbert (CHOP, USA); Priscilla Machado, Corinne Wessner, Hailee Mayer and Flemming Forsberg (Thomas Jefferson University, USA); Sudha Anupindi (CHOP, USA)

15:30 - A Performance Evaluation of Filtered Delay Multiply and Sum Beamforming for Ultrasound Localization Microscopy: Preliminary Results
Anilakkad N. Madhavanunni (Indian Institute of Technology Palakkad, India); Niya Mariam Benoy (College of Engineering Trivandrum, India); Mahesh Raveendranatha Panicker (Singapore Institute of Technology, Singapore); Himanshu Shekhar (Indian Institute of Technology Gandhinagar, India)

15:45 - Revealing Flow Dynamics in Microfluidic-Inspired Devices through Nanobubble-Mediated Ultrasound Localization Microscopy
Tamar Mano and Tali Ilovitsh (Tel Aviv University, Israel)

16:00 - 18:30
Poster Session 2
Session Chair: Biren Parmar (Exo Imaging, USA)

16:00 - Towards AI based Freehand 3D Ultrasound Reconstruction
Anand Narasimhamurthy, Rahul Kumar, Neeraj Sharma, Pravallika Saladi and Komal Shah (Indian Institute of Science, Bangalore, India); Manish Arora (Indian Institute of Science, India)

16:02 - Deep learning-based one-shot model for photoacoustic image reconstruction
Sowmya Chandramoorthy (Verasonics, India); Navchetan Awasthi (University of Amsterdam, India); Francis Kalloor Joseph (Erasmus Medical Center, The Netherlands)

16:04 - Deep learning-based tumor detection and segmentation for automated 3D breast ultrasound imaging
Francien Barkhof and Silvia Abbring (UvA, The Netherlands); Rohit Pardasani (General Electric HealthCare, India); Navchetan Awasthi (University of Amsterdam, The Netherlands)

16:06 - Speckle Noise Reduction from Ultrasound Images Using Denoising Auto-encoder with skip connection
Suraj Rajeshwar Bhute (IIT Kharagpur, India); Subhamoy Mandal (German Cancer Research Center, Heidelberg, Germany)

16:08 - Deep-learning based photoacoustic image reconstruction
Arijit Paramanick (Indian Institute of Science Education and Research Thiruvananthapuram, India); Tathagata Das (IISER TVM, India); Deepayan Samanta (IISER Tiruvananthapuram, India); Suhesh Kumar Singh (IISER Trivandrum, India)

16:10 - Spatial Impulse Response of Ultrasound Transducer Correction Using Deep Learning in Photoacoustic Tomography
Isha Munjal and Jaya Prakash (Indian Institute of Science, India)

16:12 - Fetal Ultrasound Brain Biometry: An Integrated Deep Learning Framework
Kowsalya Balamuralei Umamaheswari (Indian Institute of Technology - Madras, India); Sathiya Murthi Sankaran (University of Southern California, USA); Mohanram N (Madras Medical College, India); Arun K Thittai (Indian Institute of Technology Madras, India)

16:14 - Automatic Segmentation of Cardiac Structures From 2D Echocardiographic Images Using Transformers
Anne Chel (University of Amsterdam, The Netherlands); Victor Retamal Guiberteau (UvA, The Netherlands); VIctor Kyriacou (University of Amsterdam, The Netherlands); Laura Latorre Moreno (Vrije University, The Netherlands); Mats Gonggrijp (UvA, The Netherlands); Navchetan Awasthi (University of Amsterdam, India)

16:16 - Unsupervised Classification of THYROID Cancer using Multiwavelength Photoacoustic Imaging
Saugata Sinha and Megha Patil (Visvesvaraya National Institute of Technology, India); Navalgund Rao (University of Rochester Medical Center, USA); Bhargava K Chinni (Johns Hopkins University, USA); Vikram S Dogra (University of Rochester, USA)

16:18 - Zero-Shot Multi-Frequency Ultrasound Simulation using Physics Informed GAN
Raj Krishan Ghosh and Debdoot Sheet (Indian Institute of Technology Kharagpur, India)

16:20 - Deep Learning based Multi-modal Ultrasound-Photoacoustic Imaging
Sumana Halder (IIT Kharagpur, India); Koel Chaudhury (Indian Institute of Technology Kharagpur, India); Subhamoy Mandal (German Cancer Research Center, Heidelberg, Germany)

16:22 - Implementation of a novel transmit- receive scheme using only 8 active elements: Preliminary Results
Rahul R (Indian Institute of Technology Madras, Chennai, India); Arun K Thittai (Indian Institute of Technology Madras, India)

16:24 - Single Sonomyography Sensor-Based Hand Gesture Recognition Across Multiple Arm Positions
Anne Tryphosa Kamatham and Biswarup Mukherjee (Indian Institute of Technology Delhi, India)

16:26 - Design and Development of a Compact and Inexpensive Sinusoidal External Mechanical Vibration System for Ultrasound Shear Wave Elastography
Manu K S and Sapna Bisht (Indian Institute of Technology Gandhinagar, India); Karla Mercado-Shekhar (IIT Gandhinagar, India)

16:28 - A fiber Bragg grating sensor for ultrasound exposimetry: A feasibility study
Kuldeep Jajoria (Indian Institute of Technology, Gandhinagar & IITGN, India); Arup Chakraborty and Himanshu Shekhar (Indian Institute of Technology Gandhinagar, India)

16:30 - Towards soft-robotic assistance of ultrasonic Imaging
Gajendra Singh (IIT Jodhpur & AIIMS Jodhpur, India); Manish Chauhan (University of York, United Kingdom (Great Britain)); Deepak Mishra (IIT Jodhpur, India); Rahul Choudhary and Pushpinder Singh Khera (AIIMS Jodhpur, India)

16:32 - Building scalable, extensible, and adaptable software-defined ultrasound systems
Marcin Lewandowski (us4us Ltd., Poland & Institute of Fundamental Technological Research, Poland)

16:34 - A versatile USB ultrasound platform for portable application development
Tony Matéo (Vermon, France)

16:36 - Ultrasonic Non-Destructive Testing (NDT) of Hydrogen Fuel Cell Components
Pooja Ravindran and Nishal Ramadas (Azeriri Private Limited, India); Raman Vedarajan and Ramya K (ARCI, India)

16:38 - Enabling Directional Frequency-Selective Power Transmission in Ultrasonic Guided Wave Inspections
Masoud Mohammadgholiha (DEI - University of Bologna, Italy); Stefano Taccetti (ARCES - University of Bologna, Italy); Luca De Marchi (University of Bologna, Italy)

16:40 - Unlocking Potential: Harnessing k-Wave for Ultrasonic Non-Destructive Evaluation
Navneet Kumar (Presidency University, Bengaluru, India); Kiran Dhanaji Kale and Rajiv Ranjan Singh (Presidency University, Bangalore, India); Ramprasad B (Indian Space Research Organization, India)

16:42 - Torsional ultrasonic guided wave-based smart SHM system for locating defects in pipes
Sheetal Shivaji Patil (IIT Bombay, India); Sauvik Banerjee (Indian Institute of Technology Bombay, India); Siddharth Tallur (Indian Institute of Technology, Bombay, India)

16:44 - Development and Study of Electronic Delay Reference Standard for Ultrasonic Pulse Velocity Measurement Devices
Piyush Verma (CSIR-National Physical Laboratory & AcSIR - Academy of Scientific & Innovative Research, India); Sanjay Yadav (CSIR-National Physical Laboratory, India & AcSIR - Academy of Scientific & Innovative, India); Premshankar Kedarnath Dubey (CSIR-National Physical Laboratory, India & AcSIR - Academy of Scientific & Innovative Research, India)

16:46 - A novel acoustic superscatterer having tunable scattering cross-section
Vineeth P Ramachandran (Defence Research and Development Organisation- Hyderabad, India); Prabhu Rajagopal (IIT Madras, USA)

16:48 - Exploring the tunability of acoustic resonator with Sol-gel PZT for Ultra-High Frequency applications
Jyothish Raj (Indian Institute of Science Bangalore, India); Kongbrailatpam Sandeep Sharma (CeNSE, IISC Bangalore, India); Chandrashekar L N (IISc, India); Antony Jeyaseelan A (Indian Institute of Science, India); Gayathri Pillai (IISc Bangalore, India)

16:50 - Polarized composite-polymer materials PVDF-TrFE /Bi2O3 for fabricating broadband high frequency ultrasound and photoacoustic transducers

Shivam Rakhoulya and Neelkamal Das (Indian Institute of Science Education and Research Mohali, India); Nagendra Singh (IISER Mohali, India); Samir Kumar Biswas (Indian Institute of Science Education and Research Mohali, India)

16:52 - Towards fabrication, packaging and characterization of high frequency 1D pMUT arrays

Manish Arora and Atheeth Shivalinga Prasad (Indian Institute of Science, India)

16:54 - Design and Development of 10 MHz Transceiver Circuit for CMUT

Gaurav Madhukar (CSIR-CEERI, Pilani, India); Anoop Pandey (CSIR CEERI Pilani, India); Shuvam Gupta (Academy of Scientific and Innovative Research (AcSIR), India & CSIR-CEERI, India); Soumendu Sinha (CSIR-CEERI, Pilani, India & AcSIR, India); Anil Kumar Saini (CSIR CEERI, India); Rishi Sharma (CEERI, Pilani, India); Ravindra Mukhiya (CSIR-CEERI, Pilani, India)

16:56 - Investigation of Capacitive Micromachined Transducers for Characterizing Specular Reflectors in Diagnostic Ultrasound Imaging

Harshinee Murali (National Institute of Technology, Tiruchirappalli, India); Gayathri Malamal (Indian Institute of Technology Palakkad, India); Mahesh Raveendranatha Panicker (Singapore Institute of Technology, Sinagpore)