Track 8: Photonic Sensors & Bio-Photonics
Hong Kong Hall I, 2F

13:30-15:30 • November 05, 2023 • Sunday
Optical imaging techniques
Presider: Dan Zhu, Huazhong University of Science and Technology, China

13:30-14:15 • ACPPOEM-0727-1 *Tutorial*
Tissue optics and optical clearing in a wide spectral range: from deep UV to THz
Valery Tuchin[1,2,3,4]
1.Inst. of Physics and Science Medical Center Saratov State University, Russia; 2.Inst. of Precision Mechanics and Control FRC "Saratov Scientific Center of the Russian Academy of Science", Russia; 3.Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University, Russia; 4..N. Bach Institute of Biochemistry, FRC "Biotechnology of the Russian Academy of Sciences", Russia
The tutorial presents the principles and achievements of tissue optics and photonics in a wide spectral range, covering wavelengths from deep UV to the terahertz range.

14:15-14:45 • ACPPOEM-1009-38 *Invited*
Deep-tissue optics: recent advances via photoacoustics and wavefront shaping
Puxiang Lai
Hongkong Polytechnic University, Hong Kong, China
Light has been playing a more and more important role in biomedicine due to its extremely sensitive reaction to biological and pathological changes to tissues. Its applications, however, are limited to superficial layers beneath sample surface or compromised resolution at depths due to the inherent strong scattering nature of light in tissue. In this presentation, we would like to share with you our recent journey in the field to achieve high-resolution or high-fidelity imaging through thick scattering media or biological tissue based on energy conversion (photoacoustic effect), optical modulation (wavefront shaping), and computing (deep learning). We will first briefly talk about the general principles, and then discuss several representative works that have strengthened the understanding of the mechanisms and the confidence of moving forward. Towards the end, a couple of new applications will be discussed along with the future roadmaps.

14:45-15:15 • ACPPOEM-1009-43 *Invited*
High throughput imaging based on ultrafast optical clearing
Ke Si
Zhejiang University, China
The development of high-precision optogenetics in deep tissue is limited due to the strong optical scattering induced by biological tissue. Although various wavefront shaping techniques have been developed to compensate the scattering, it is still a challenge to non-invasively characterize the dynamic scattered optical wavefront inside the living tissue. Here, we present a non-invasive scattering compensation system with fast multidither coherent optical adaptive technique (fCOAT), which allows the rapid wavefront correction and stable focusing in dynamic scattering medium. We achieve subcellular-resolution focusing through 500-μm-thickness brain slices, or even three pieces overlapped mouse skulls after just one iteration with a 589 nm CW laser. Further, focusing through dynamic scattering medium such as live rat ear is also successfully achieved. The formed focus can maintain longer than 60 s, which satisfies the requirements of stable optogenetics manipulation. Moreover, the focus size is adjustable from subcellular level to tens of microns to freely match the various manipulation targets. With the specially designed fCOAT system, we successfully achieve single-cellular optogenetic manipulation through the brain tissue, with a stimulation efficiency enhancement up to 300% compared with that of the speckle.

15:15-15:30 • ACPPOEM-0731-78
Application of optoacoustic imaging and diffuse optical spectroscopy in experimental oncology
Anna Orlova[1], Ksenia Akhmedzhanova[1,2], Alexey Kurnikov[1], Anna Glyavina[1,2], Dmitry Khochenkov[3], Yulia Khochenkova[3], Anna Maslennikova[1,2], Dmitry Skamnitsky[4], Ilya Turchin[1], Pavel Subochev[1]
1.Institute of Applied Physics of Russian Academy of Sciences, Russia; 2.N.I. Lobachevsky State University of Nizhny Novgorod, Russia; 3.N.N. Blokhin National Medical Research Center of Oncology, Russia; 4.Nizhny Novgorod Regional Oncology Hospital, Russia
Using optoacoustic (OA) microscopy and diffuse optical spectroscopy (DOS) differences in the vessel fraction and oxygenation level of tumor xenografts are revealed. Radiation-induced changes were demonstrated for vessels of different diameters.

15:30-16:00 Coffee Break

16:00-18:15 • November 05, 2023 • Sunday
Optical fiber sensing
Presider: Fei Xu, Nanjing University, China

16:00-16:30 • ACPPOEM-0830-1 *Invited*
Optical fiber sensors for monitoring current and power cables
Gilberto Brambilla
University of Southampton / The Future Photonics Hub, United Kingdom
This talk will review approaches implemented at the ORC in Southampton for optical fiber sensing of current and power distribution, with focus on monitoring offshore power cable infrastructures and sensing of pulsed currents.

16:30-17:00 • ACPPOEM-0814-25 *Invited*
Forward Brillouin Scattering Fiber Sensors
Avi Zadok
Bar-Ilan University, Israel
Sensors based on forward Brillouin scattering processes allow for quantitative analysis of liquid media and coating layers outside the cladding of standard, unmodified fibers. Point measurements and spatially distributed analysis have been demonstrated.

17:00-17:30 • ACPPOEM-0810-5 *Invited*
Microcavity-enhanced optical sensing, imaging and spectroscopy
Tang Shui-Jing
Peking university, China
Sensors play an important part in many aspects of daily life such as motion sensors in mobile phones, particle sensors for environmental monitoring, and infrared sensors in home security systems. High-quality optical microcavities are prime candidates for sensing applications because of their ability to enhance light-matter interactions in a very confined volume. In particular, microcavity-based sensors have attracted considerable interest in life science due to their distinguished advantages such as high sensitivity, fast response, and miniature device sizes. Here I will introduce microcavity-enhanced optical detection in sensing, imaging, and spectroscopy applications, and mainly cover the following three parts: 1. Single-nanoparticle and single-molecule sensing; 2. Microcavity-based versatile imaging, including photoacoustic microscopy and single-cell tracking. 3. Single-particle optoacoustic vibrational spectroscopy.

17:30-17:45 • ACPPOEM-0815-63
Fast Brillouin optical time domain analysis utilizing double-sideband digital optical frequency comb
Huan He[1], Yingxuan Li[1], Xuan Zou[1], Zhiyong Zhao[1], Dongmei Huang[2], Ming Tang[1]
1.Huazhong University of Science and Technology, China; 2.The Hong Kong Polytechnic University, Hong Kong, China
Utilizing double-sideband digital optical frequency comb, a fast BOTDA based on simultaneous measurement of Brillouin gain and loss spectrum is demonstrated. Measurements with less than 1-MHz uncertainty over 10-km fiber are achieved in 5.5 ms.

17:45-18:00 • ACPPOEM-0811-10
Photonic Skin based on Microfiber Bragg Grating for Pulse Wave Detection
Hengtian Zhu, Junxian Luo, Shugeng Zhu, Huan Yang, Fei Xu
Nanjing University, China
An intelligent photonic skin, utilizing femtosecond laser direct-writing microfiber Bragg gratings, has been proposed for the detection of pulse waves. Through structure engineering, the sensitivity of the photonic skin is significantly enhanced by 12 times.

18:00-18:15 • ACPPOEM-0813-12
Load Measurement Based on Forward Stimulated Brillouin Scattering in Photonic Crystal Fiber
Xuan Zou[1], Yunshan Zhou[1], Zhiyong Zhao[1], Weilun Wei[1], Chen Yang[2], Ming Tang[1]
1.Huazhong University of Science and Technology, China; 2.Yangtze Optical Fibre and Cable Joint Stock Limited Company, and Optics Valley Laboratory, China
We demonstrate a novel optical fiber transverse loadsensor based on forward stimulated Brillouin scattering (FSBS) in photonic crystal fiber. Highly linear dependence between linewidth of FSBS spectrum and transverse load has been experimentally verified.

17:30-20:00 Welcome Reception

08:30-10:00 • November 06, 2023 • Monday
Optical imaging techniques
Presider: Junle Qu, Shenzhen University,China

08:30-09:15 • ACPPOEM-0814-2 *Tutorial*
Deep Imaging in Scattering Biological Tissues
CHRIS XU
CORNELL UNIVERSITY, United States
This tutorial aims to elucidate the challenges for high spatial resolution, deep tissue, three-dimensionally resolved fluorescence microscopy. The state-of-the-art approaches and their performance and limitations for deep tissue imaging will be discussed.

09:15-09:45 • ACPPOEM-0812-4 *Invited*
Intelligent Image-Activated Cell Sorting 2.0
Keisuke Goda[1,2,3]
1.University of Tokyo, Japan; 2.Wuhan University, Japan; 3.University of California, Los Angeles, United States
I introduce an upgraded version of Intelligent Image-Activated Cell Sorting, a groundbreaking technology that enables real-time, intelligent, molecular image-based sorting of cells at an unprecedented rate of 1000 cells per second.

09:45-10:00 • ACPPOEM-0819-2
Synthetic aperture based PA-US dual-modality all optical fiber imaging optical fiber imaging
Dongchen Xu, Anqi Wang, Geng Chen, Chenhao Dai, Hao Li, Qizhen Sun
Huazhong University of Science and Technology, China
A synthetic aperture based PA-US dual-modality all optical fiber imaging system with a denoising algorithm is demonstrated. The algorithm increases SNR of the reconstructed image by 11.1 dB, and a dual-modality image of a vascular model is clearly reconstructed.

10:00-10:30 Coffee Break

10:30-12:00 • November 06, 2023 • Monday
Optical coherence tomography
Presider: Linbo Liu, Nanyang Technological University, Singapore

10:30-11:00 • ACPPOEM-0720-1 *Invited*
Experimental evaluation of human skin optical clearing in vivo efficiency using biocompatible agents and optical coherence tomography
Walter Blondel[1], Sergey Zaytsev[2], Valery Tuchin[2], Elina Genina[2], Dan Zhu[3], Marine Amouroux[1]
1.Université de Lorraine, France; 2.Saratov State University, Russia; 3.Britton Chance Center for Biomedical Photonics - Huazhong University of Science and Technology, China
In the present study, the clearing-effectiveness of nine biocompatible OCAs mixtures combined with dermabrasion and sonophoresis was investigated on three volunteers hand skin using line-field confocal OCT and image contrast modelling with depth and time.

11:00-11:30 • ACPPOEM-1009-41 *Invited*
Micro-optical coherence tomography: image interpretation and safety management
Linbo Liu
Nanyang Technological University, Singapore
Micro-optical coherence tomography (Micro-OCT) provides one order of magnitude higher spatial resolution than the standard OCT technology. There has been little study on the new information brought about by this resolution improvement. We investigated the back-scattered intensities from clustered or packed nanometer scale intracellular scatterers using Micro-OCT, and uncovered that there existed correlations between the reflectance contrasts and the ultrastructural clustering or packing states of these scatterers, which allows us to interpret the physiological state of the cells. Further preliminary study demonstrated that these new understandings of OCT image contrast enables the characterization of precancerous lesions, which could complement the current morphology-based criteria in realizing "virtual histology".

11:30-11:45 • ACPPOEM-0731-120
OPTOACOUSTIC ANGIOGRAPHY WITH ULTRAWIDEBAND ULTRASONIC DETECTORS: volumetric, multispectral, and realtime
Pavel Subochev
IAP, Russia
The talk overviews optoacoustic angiography, a hybrid imaging technique for in vivo diagnostics of blood vessels. The basics of optoacoustic imaging will be covered, and different approaches for system optimization will be discussed. The advantages and limitations of using PVDF detectors in optoacoustic angiography applications will be presented. The talk highlighted the technical features of two optoacoustic systems, and their potential diagnostic and research applications. Scanning optoacoustic angiography can be used to identify blood vessel abnormalities associated with various pathologies and has great promise for tumor diagnosis and anti-tumor treatment. Volumetric real-time optoacoustic tomography offers addi-

tional advantages over traditional methods, such as multimodal contrast and real-time feedback providing important 5D imaging capabilities for neuroimaging.

11:45-12:00 • ACPPOEM-0814-16
High-sensitivity ultrasound sensors based on optical microcavities
Hao Yang, Xuening Cao, Zhi-Gang Hu, **Bei-Bei Li**
Institute of Physics, Chinese Academy of Sciences, China
We have realized high-sensitivity air-coupled ultrasound sensing in the kHz-to-MHz renage using whispering gallery mode microcavities. A peak sensitivity of 1.18 μPa Hz−1/2 is achieved, which represents the record sensitivity among cavity optomechanical ultrasound sensors.

12:00-13:30 Lunch Break

13:30-16:00 • November 06, 2023 • Monday
Optical fiber sensing
Presider: Qizhen Sun, Huazhong University of Science and Technology, China

13:30-14:00 • ACPPOEM-1009-40 *Invited*
Distributed Optic Fiber Sensing Technology in Optical Frequency Domain and Its Applications
Guolu Yin
Chongqing University, China
Optical frequency domain reflectometry has broad application prospects in precision measurement of photonic devices, flexible three-dimensional shape sensing, distributed biochemical sensing, and other fields due to its high spatial resolution. In this report, we will demonstrate two kinds of signal processing methods based on machine learning and differential phase. On the basis of the traditional cross-correlation algorithm, we first used the multilayer perceptron and convolutional neural network to realize the classification learning and regression analysis of the sensing signal of the optical frequency domain reflectometry. In the method of differential phase, we used the two-step unwrapping algorithm to solve the problem of the phase jumping, and used the wavelet analysis to remove the Gaussian white noise. Finally, we will demonstrate the applications of optical frequency domain reflectometry, including the shape sensing, pH senging and liquid level sensing.

14:00-14:30 • ACPPOEM-0829-1 *Invited*
Highly deformable magnetic elastomer (ME) based miniature fibre-optic magnetic field sensor
Zhi Li, Sacha Noimark
University College London, United Kingdom
A miniature design for a fibre-optic magnetic sensor based on highly responsive ME composites, which enables real-time measurement of small changes in magnetic fields using an interferometric interrogation scheme. This highly sensitive and miniaturesensoris cost-effective, simple in design, immune to EM interference and well-suited to MRI-relevant applications.

14:30-15:00 • ACPPOEM-1009-42 *Invited*
Optical Fibre sensing for Battery Testing and Characterisation
Yifei Yu
Huazhong University of Science and Technology, China
The precise in-situ testing, characterization, and failure analysis of battery materials is a global scientific challenge. Therefore, the development of non-invasive monitoring tools for tracking and managing power and energy storage batteries throughout their entire lifecycle is of great importance. The development of optical fiber communication technology has facilitated the advancement of optical fiber sensors, and the complementary information provided by optical fiber sensing and conventional electrochemical techniques will offer more support for battery exploration. This report discusses optical fiber sensing and in-situ monitoring of batteries, the advantages of using optical fiber sensing in battery monitoring, the principles of optical fiber sensing, and its application in the field of battery detection. Given the characteristics of rapid changes in failure features, long United Statesge cycles, and short fault occurrence times in power and energy storage battery systems, there is a need to develop optical fiber sensing detection technology, equipment, and solutions. Based on the analysis of temperature and stress data along the optical fiber, preliminary insights have been gained into the correspondence between battery charging status and health status and the characterization of material-electrode-battery structure and thermal performance, allowing for real-time, in-situ quantitative assessment.

15:00-15:15 • ACPPOEM-0731-170
Femtosecond Laser Inscribed POF Bragg Grating for Flexible and Wearable Sensing Applications
Liuyu Jia, Hao Jiang, Lin Ma, Zuyuan He
State Key Laboratory of Advanced Optical Communication Systems and Networks, Shanghai Jiao Tong University, China
We demonstrate polymer optical fiber Bragg grating directly inscribed using a femtosecond laser for flexible and wearable sensing applications. An elastic strain exceeding 4% has been achieved with an axial strain sensitivity of 0.99 pm/με.

15:15-15:30 • ACPPOEM-0801-157
Microcomb driven graphene oxide deposited FBG array for multispecies parallel gas sensing
Zihan Liu, Yiwei Li, Yuchen Wang, Bing Chang, Ning An, Teng Tan, Baicheng Yao
University of Electronic Science and Technology of China, China
By utilizing soliton microcomb to drive graphene oxide functionalized fiber Bragg grating arrays, we achieve a multispecies parallel gas sensor, realizing the detection of SO_2 and H_2S in the SF_6, with sensitivity down to ppb-level.

15:30-15:45 • ACPPOEM-0814-20
Frequency Response Range Expanded Slope-assisted BOTDA Sensor Using Randomized Sampling Technique
Weilun Wei, Zhonghong Lin, Zhiyong Zhao, Can Zhao, Xuan Zou, Ming Tang
School of Optical and Electronic Information and Wuhan National Laboratory for Optoelectronics Huazhong University of Science and Technology, Wuhan, China
A novel frequency response range expanded slope-assisted BOTDA sensor is proposed and demonstrated using randomized sampling technique, which paves the way to enable ultra-high frequency vibration signal measurements in long range sensing.

15:45-16:00 • ACPPOEM-0815-51
High-Resolution Liquid Level Sensor Based on Microwave Photonics Technique interrogated Multicore Fiber Interferometer
Yucheng Yao[1], Jianqiang Yuan[1], Zhiyong Zhao[1], Lei Shen[2,3], Weijun Tong[1], Ming Tang[1]
1.School of Optical and Electronic Information and Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, China; 2.The State Key Laboratory of Optical Fiber and Cable Manufacture Technology, China; 3.Yangtze Optical Fiber and Cable Joint Stock Limited Company (YOFC) R&D Center, China
A high-resolution liquid level sensor based on microwave photonics filter technology interrogated seven-core fiber Michelson interferometer is reported. The measured sensitivity is 10.97 MHz/cm and a liquid level resolution of 0.04558 cm is achieved.

15:30-18:00 Coffee Break & Poster Session

18:30-21:00 Banquet and Awards Ceremony

08:30-10:00 • November 07, 2023 • Tuesday
Super-resolution imaging
Presider: Ke Si, Zhejiang University, China

08:30-09:00 • ACPPOEM-0814-12 *Invited*
High-throughput and four-dimensional live-cell super-resolution imaging
Haoyu Li
Harbin Institute of Technology, China
Super-resolution (SR) imaging with high-throughput is invaluable to fast and high-precision profiling in a wide range of biomedical applications. However, prevalent SR methods require sophisticated acquisition devices and specific imaging control, and may cost a fairly long time on a single field-of-view. These essentially increase the construction difficulty, including challenges in imaging throughput, system establishment, and automation. Using the natural photophysics of fluorescence, fluctuation-based microscopy techniques can routinely break the diffraction limit with no need for additional optical components, but its long acquisition time still poses a challenge for high-throughput imaging or visualizing transient organelle dynamics. Here, we propose an SR method based on the Auto-Correlation with two-step Deconvolution (SACD) that reduces the number of frames required by maximizing the detectable fluorescence fluctuation behavior in each measurement, with further removal of tunable parameters by a Fourier ring correlation analysis. It only needs 20 frames for twofold lateral and axial resolution improvements, while the SR optical fluctuation imaging (SOFI) needs more than 1000 frames. As an open-sourced module, we anticipate SACD can offer direct access to SR, which may facilitate the biology studies of cells and organisms with high-throughput and low-cost.

09:00-09:30 • ACPPOEM-0815-15 *Invited*
Upconversion super-resolution microscopy
Qiuqiang Zhan
South China Normal University, China
Photon upconversion offers an exciting opportunity for various photonics technologies. By harnessing excitation and emission processes of upconversion, we discovered powerful nonlinear depletion/emission strategies, enabling high-performance super-resolution microscopy by breaking the unbroken traditional STED limitations.

09:30-10:00 • ACPPOEM-0827-3 *Invited*
The development of highly photostable organic fluorescent probes for STED super-resolution imaging
Chenguang Wang
Jilin University, China
Stimulated Emission Depletion (STED) super-resolution fluorescence imaging is a powerful tool to visualize the organelle structures and dynamic processes on the nanoscale in living cells, thus wining the Nobel Prize in Chemistry (2014). However, the practical utility of STED imaging is largely limited by the availability of advanced fluorescent probes that can be efficiently depleted by the STED laser as well as exhibits significantly high photostability. In this context, the development of superior fluorescent probes has attracted much attention in recent years and emerged as a cutting-edge topic in the field of fluorescence bio-imaging. Herein, we report a new small-molecular fluorescent probe Lipi-DSB which exhibits high photostability and brightness, large Stokes shift, low saturation intensity for STED laser, and good staining specificity toward cellular lipid droplets (LDs). These features enable the probe to be ideally applied in STED super-resolution imaging of LDs, e.g. time-lapse STED imaging, two-color STED imaging, as well as 3D STED imaging. Consequently, the dynamics and the spatial distribution of LDs have been precisely visualized at the unprecedented nanoscale resolution. Moreover, employing the probe for time-lapse STED imaging has uncovered the fusion process of nascent LDs for the first time.

10:00-10:30 Coffee Break

10:30-12:00 • November 07, 2023 • Tuesday
Optical imaging and Phototherapy
Presider: Qiuqiang Zhan,South China Normal University, China

10:30-11:00 • ACPPOEM-1009-39 *Invited*
Applications of near infrared luminescence imaging and sensing using rare earth doped nanoparticles
Tymish Ohulchanskyy
Shenzhen University, China
Rare-earth doped nanoparticles (RENPs) are known to reveal a unique ladder-like system of energy levels in rare-earth ions that manifest multiple luminescence emission bands distinguishable by spectrally narrow shape and large Stokes and anti-Stokes shifts. RENPs luminescence involves excitation energy downconversion (DC) and upconversion (UC) and RENPs are broadly utilized as promising UC and DC luminescent nanomaterials in diverse applications, ranging from bioimaging and therapy to lasing, sensing and anti-counterfeiting. Special spectral and temporal features of UC and DC luminescence from RENPs allowed us to employ them as imaging agents in advanced optical imaging modalities, such as hyperspectral, time-gated and luminescence lifetime imaging. Use of near and short wave (NIR-SWIR) spectral region opens new perspectives in the field of biological imaging and sensing due to a reduced light scattering in NIR-SWIR range. This talk will present our results on the applications of the developed RENPs in advanced NIR-SWIR imaging and sensing, concluding with a discussion on the perspectives of RENPs use in various optical imaging and sensing applications.

11:00-11:30 • ACPPOEM-0724-2 *Invited*
Phototherapy of Alzheimer's disease during sleep
Oxana Semyachkina-Glushkovskaya[1,2], Ivan Fedosov[1], Alexander Shirokov[1], Andrey Terskov[1], Inna Blokhina[1]
1.Saratov State University, Russia; 2.Humboldt University, Germany
Photobiomodulation during sleep vs. wakefulness better improves removal of amyloid beta from brain that is associated with effective recovery of metabolic activity and recognition memory in mice with Alzheimer's disease.

11:30-12:00 • ACPPOEM-0730-6 *Invited*
Modulation of Organic Semiconductors for Optical Imaging and Biosensing
Changfeng Wu
Southern University of Science and Technology, China
We describe the development of semiconductor polymer dots (Pdots) for biomedical imaging and biosensing applications, including photophysical modulation for Super-resolution imaging, spectral tuning for in vivo Imaging, and dye doping for continuous glucose monitoring.

12:00-13:30 Lunch Break

13:30-15:15 • November 07, 2023 • Tuesday
Photonic Sensors
Presider: Liang Wang, Huazhong University of Science and Technology, China

13:30-14:00 • ACPPOEM-1009-44 *Invited*
Photonic techniques for sensing microcirculatory and microrheologic disorders in patients
Alexander Priezzhev
Moscow State University, Russia
The feasibility of biophotonic technologies (laser tweezers, diffuse light scattering, laser diffractometry and digital capillaroscopy) for sensing microrheological effects of various molecular mechanisms affecting erythrocyte aggregation and deformability will be discussed. We will show that laser tweezers and diffuse light scattering allow for assessing the changes in erythrocyte aggregation in whole blood samples and cell suspensions both on the level of single cells and on the level of large ensembles of cells. Application of these methods in vitro enable one to study the mechanisms of erythrocyte aggregation because they are sensitive to changes in the medium surrounding the cells (i.e., blood plasma, serum or model solutions of blood plasma proteins) and to changes in the cellular properties of the erythrocytes. Using the laser diffractometry technique we can assess the distribution of the erythrocytes in sizes and deformabilities. Using digital capillaroscopy we can monitor in vivo the alterations of blood flow parameters on the microcirculatory level where the major exchange of gases between blood and tissues takes place. We have been applying all these techniques to monitor and analyze the alterations of blood microrheology and microcirculation in patients suffering from such socially important diseases as arterial hypertention, diabetes mellitus, etc.

14:00-14:30 • ACPPOEM-0730-37 *Invited*
High-resolution fiber sensing for marine multi-element environment based on microwave photonics
Muguang Wang
Beijing Jiaotong University, China
For the application of marine environment survey, multi-parameter fiber sensing with high resolution based on microwave photonics is presented from aspects of optic fiber probe and microwave photonic demodulation.

14:30-14:45 • ACPPOEM-0815-24
Fast-scanning ultraviolet histological photoacoustic microscopy based on fiber-optic ultrasound detection
Zehua Yu, Yizhi Liang, Long Jin
Jinan University, China
We developed a fast-scanning ultraviolet photoacoustic microscope for intraoperative histopathology. This was achieved by detecting the UV-induced ultrasound waves by using a high-sensitivity, wide-field fiber optic ultrasound sensor.

14:45-15:00 • ACPPOEM-0726-12 *Industry Innovation Nomination*
LiDAR Point Cloud Image Modeling and Quality Testing Method
Chuanchuan Yang[1], Yao Duan[1], Yongxin Cao[2], Jiajie Yang[2], Wenhua Chen[2], Hongbin Li[1]
1.Peking University, China; 2.TÜV Rheinland (Shenzhen) Co., China
This paper develops a modeling method for LiDAR point cloud imagewhich can accurately simulate the interferences encountered by LiDAR in the real world, and a method to test the quality of LiDAR point cloud.

15:00-15:15 • ACPPOEM-0731-156
Phase Noise Induced Interference for Coherently-detected OTDR Systems
Zexu LIU[1,2], Weiqi Lu[2], Lei LIU[2], William Shieh[2]
1.Zhejiang University, China; 2.Westlake University, China
In COTDR system, the phase noise induced interference (PNII) are investigated. For the first time, an analytical expression for the PNII is obtained for COTDR. Numerical simulation is also carried out to verify the theoretical results.