

Progress in Biomedical Photonics 2024

December 13, 2024 from 09:30 to 16:45

Hörsaal OST HOER B5, University Hospital Zurich

Program

09:30-09:50: Registration, coffee and hang up posters in front of the HOER B5.

Presentations (Room HOER B5) Chair: Dr. Tarcisi Cantieni

09:50-10:00: Welcome and introduction by Martin Wolf, President of BMPN

10:00-10:15: Nanoplasmonic Infrared Biosensor Coupled with Deep Learning for the Detection of Structural Protein Biomarkers in Neurodegenerative Diseases
Deepthy Kavungal*, P. Magalhães, S. Kumar, R. Kolla, H. Lashuel, H. Altug
BioNanoPhotonic Systems Laboratory, EPFL

10:15-10:30: Nanoplasmonic Single-Tumoroid Microarray for Real-Time Secretion Analysis
Y. C. Liu, S. Ansaryan, Jiayi Tan*, N. Broguiere, L. F. Lorenzo-Martín, K. Homicsko, G. Coukos, M. P. Lütolf, H. Altug
BioNanoPhotonic Systems Laboratory, EPFL

10:30-10:45: Designing Optical Nanobiosensors for Glucose Detection Based on Clustering and Deep Learning
Yahya Rabbani*, J. Bregy, B. Rousseau, S. H. Sajjadi, L. De Benedittis, S. Behjati, M. Mouhib, S. Dehury, A. A. Boghossian
Laboratory of Nanobiotechnology, EPFL

10:45-11:00: Zirconium Dental Implants as Optical Waveguides in Antimicrobial Photodynamic Therapy
Kolja Lehmann*, T. A. Schweizer, A. Kalyanov, H. Walt, H. Essig
Department of Cranio-Maxillo-Facial and Oral Surgery, UZH

* Competing for Best Presentation Award

Sponsors

- 11:00-11:15: Point-Spread-Function Engineering in MINFLUX: Optimality of Donut and Half-Moon Excitation Patterns
Yan Liu*, J. Dong, J. A. Maya, F. Balzarotti, M. Unser
Biomedical Imaging Group, EPFL
- 11:15-11:30: Comparison of different phase functions in light propagation simulations for short source-detector distances
Letizia Lanini*, T. Li, D. Yacheur, A. Kalyanov, M. Ackermann,
E. Russomanno, A. Di Costanzo Mata, M. Wolf, J. Jiang
Biomedical Optics Research Laboratory, UZH & ETHZ
- 11:30-11:45: Linking Brain Activation Patterns to Clinical Outcomes: fNIRS Study of Speech Understanding in Cochlear Implant Users and Normal Hearing Individuals
András Bálint*, W. Wimmer, C. Rummel, M. Caversaccio, S. Weder
Hearing Research Laboratory, ARTORG Center, UNIBE
- 11:45-12:00: From Lab to Clinic: Advancing fNIRS for Enhancing Upper Limb Rehabilitation in Stroke with Novel Treatments
Camille Pescatore*, A. Nardello, D. Wyser, R. Gassert
Rehabilitation Engineering Laboratory, ETHZ
- 12:00-12:15: Adapting X-ray dark-field imaging for clinical practice: a path towards enhanced disease characterisation in routine healthcare
Weneri Lindberg*, H. Richter, F. Alfayez, K. Pratama, O. Bonny,
D. Terebenec, R. Rossi, A. Neels, R. Zboray
Department of Health Sciences and Technology, ETHZ
- 12:15-12:30: A New Era in Healthcare: Continuous Biomarkers Monitoring with Photoplethysmography
Benjamin Burgat*
Digital Health, CSEM

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12:45-14:45: Lunch break and poster viewing in front of HOER B5

Presentations (Room HOER B5) Chair: Dr. Jingjing Jiang

14:45-15:20: Invited talk: Bench-to-bedside multiscale optoacoustic imaging

Xosé Dean Ben

UZH & ETHZ

15:20-15:55: Invited talk: Intelligent Laser Systems for Surgical Applications

Ferda Canbaz

Center for Intelligent Optics, University of Basel

15:55-16:10: Monte Carlo simulation of the light propagation in the skin during photobiomodulation based on the use of a multidiode light source

Emmanuel Gerelli, G. Wagnières

Laboratory for Functional and Metabolic Imaging, EPFL

16:10-16:25: Cerebral oxygenation imaging in neonates

Alexander Kalyanov, J. Jiang, M. Ackermann, L. Lanini, M. Wolf:

Biomedical Optics Research Laboratory, USZ & UZH

16:25-16:45: Award ceremony and closing

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Poster session

- Poster 1: Long-term and continuous plasmonic oligonucleotide monitoring enabled by regeneration approach
Abtin Saateh*, S. Ansaryan, J. Gao, L. Oliveira de Miranda, P. Zijlstra, H. Altug
Institute of Bioengineering, EPFL
- Poster 2: Identification of the optimal radiometric and spectral photobiomodulation conditions to enhance angiogenesis in vitro and in vivo
J. Joniová, M. Lambelet, S. Déglise, F. Allagnat, Georges Wagnières
Laboratory for Functional and Metabolic Imaging, EPFL
- Poster 3: Gradient Metasurfaces for Enhanced Spectroscopy and High-Harmonic Generation
Felix Richter*, I. Sinev, M. L. Tseng, P. Jangid, S. Kruk, Y. Kivshar, H. Altug
BioNanoPhotonic Systems Laboratory, EPFL
- Poster 4: Discrimination of the acoustic signal in OR-PAM
Albano Tabacchi *, B. P. Singh, A. Stefanov, M. Frenz, D. Guignet
UNIBE
- Poster 5: Calibration of reflection and back-scattering Mueller Polarimetric setups
Bhanu Pratap Singh*, V. Stefanov, A. Stefanov
Institute of Applied Physics, UNIBE
- Poster 6: Simulation-Driven Qualitative Elemental Analysis of Bone, Bone Marrow and Muscle Samples Using Laser-Induced Breakdown Spectroscopy (LIBS)
Leya Pauly*, A. Hamidi, P. C. Cattin, F. Canbaz
Center for Intelligent Optics, University of Basel
- Poster 7: Dependency of Reflectance on Optical Properties at Short Distance: Adaptation of Monte Carlo Simulations and Experimental Validation
Djazia Yacheur*, L. Lanini, T. Li, M. Ackermann, A. Kalyanov, E. Russomanno, A. Di Costanzo Mata, M. Wolf, J. Jiang
Biomedical Optics Research Laboratory, ETHZ

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- Poster 8: Novel Two-Layer Liquid Phantom for Assessing NIRS Device Accuracy
Emanuele Russomanno*, X. Yang, A. Kalyanov, M. Wolf
Biomedical Optics Research Laboratory, ETHZ
- Poster 9: Design of Flexible Probe for Time Domain Near-infrared Optical Tomography (NIROT)
Xichen Yang*, M. Ackermann, J. Jiang, M. Wolf, A. Kalyanov
Biomedical Optics Research Laboratory, ETHZ
- Poster 10: Effects of smoking-related cues on cognitive performance: A systemic physiology augmented functional near-Infrared spectroscopy (SPA-fNIRS) study
Tanu Majumder*, S. Guglielmini, F. Scholkmann, M. Wolf
Biomedical Optics Research Laboratory, UZH
- Poster 11: Parallel analysis of cerebral and peripheral blood volume pulse waveforms using a modified application of a commercial functional near-infrared spectroscopy device: Initial results
Wieland Lackinger*, F. Scholkmann
Biomedical Optics Research Laboratory, UZH
- Poster 12: Enhancing SPA-fNIRS by Pupil Diameter Measurement: A Case Study Investigating Cerebral and Systemic Responses to Blue and Red Light Exposure
Hamoon Zohdi, S. Jegatheeswaran, S. Buchwalder, M. Geiser, F. Scholkmann, M. Wolf, U. Wolf
Institute of Complementary and Integrative Medicine, UNIBE
- Poster 13: Variability of Cerebral Oxygenation and Perfusion over Three Days: A Longitudinal Study Using the Pionirs NIRSBOX TD-NIRS System
Hamoon Zohdi, S. Jegatheeswaran, M. Lacerenza, M. Buttafava, F. Scholkmann, M. Wolf, U. Wolf
Institute of Complementary and Integrative Medicine, UNIBE
- Poster 14: Neural Synchrony, Mother–Infant Relationship and Child Development – Ad Interim Results
Debora Suppiger*, S. Guglielmini, M. Wolf, T. Reinelt, G. Natalucci
FLRF Center for Neurodevelopment Growth and Nutrition of the Newborn, UZH

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- Poster 15: Towards automated bad channel detection in fNIRS
P. Goyal, Huijiao Luo*, A. R. Luft, J. G. Schönhammer
Department of Astrophysics, UZH
- Poster 16: Application of Diffuse Reflectance Spectroscopy in Smart Laser Osteotomy
David Rothen*, A. Hamidi, F. Canbaz
Swiss Nanoscience Institute, University of Basel
- Poster 17: Model-Based Unmixing in Photoswitching Optoacoustic Tomography
Yan Liu*, J. Chuah, Y. Huang, A. S. Stiel, M. Unser, J. Dong
Biomedical Imaging Group, EPFL
- Poster 18: A Comparative Study using a Gaussian-like and Top-hat Er:YAG lasers for bone ablation
Mingyi Liu*, A. Hamidia, D. Blasera, D. Wilsonb, K. Garciac, F. Canbaz
Center for Intelligent Optics, University of Basel
- Poster 19: Size-Based Sorting of Microparticles Using Optical Tweezers and Microfluidic Integration
Milad Malek Mohammadi*, A. Hamidi, F. Canbaz
Center for Intelligent Optics, University of Basel
- Poster 19: Diffraction based multi-photon scanning microscope with 4 kHz framerate
Moritz Wiggert*, D. Theisen-Kunde, P. Figueras, A. Latshaw, Y. Mugnier, S. Karpf, L. Bonacina
Nonlinear Bioimaging LAB, University of Geneva
- Poster 20: Computational high-speed video reflection microscopy as a new technique to quantitatively analyze mucociliary activity
Martin Schneider, A. Grava, J. Schori, J. Wyss, P. Arnold, M. Frenz, S. A. Tschanz, A. Stefanov, L. Müller
Institute of Applied Physics and Institute of Anatomy, UNIBE
- Poster 21: Combining flow cytometry and fluorescence microscopy (imaging flow cytometry) for the detection and analysis of amyloid fibrin microclots in human blood plasma: Implementation and validation of the method
Felix Scholkmann, Y. Kok
Scholkmann Biomedical Analytics

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