

Thursday, 26/09/2024

Registration & Light Lunch

11:00-12:00 CEST

Opening of IbSB 2024

12:00-12:10 CEST

Session I:

12:10-13:40 CEST

Chair: Carl-Magnus Svensson

12:10-12:50 CEST



From variational modelling to deep learning for biomedical imaging

Carola-Bibiane Schönlieb, University of Cambridge, UK

presenting remotely

12:50-13:10 CEST



Nanotexture enabling computational multiplexing of super-resolved intracellular structures with high fidelity

Gregor Jörg Gentsch, University of Jena, Germany

Gentsch GJ, Franke C

13:10-13:30 CEST



Image- and physics-based modeling soft tissue mechanics using conventional and AI-based solving techniques

Evgeny Gladilin, Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, Germany

Coffee break

13:30-14:10 CEST

Session II:

14:10-15:30 CEST

Chair: Arjun Sarkar

14:10-14:50 CEST



Harnessing AI towards the limits of live-cell microscopy

Estibaliz Gómez-de-Mariscal, Instituto Gulbenkian de Ciência, Oeiras, Portugal

presenting remotely

14:50-15:10 CEST



Ergosterol and sphingolipids act in concert to promote aggregation of natamycin in the yeast plasma membrane

Daniel Wüstner, University of Southern Denmark, Odense, Denmark

Szomek M, Akkerman V, Lauritsen L, Egebjerg JM, Thaysen K, Walther HL, Juhl AD, Reinholdt P, Kongsted J, Bashawad M, Müller P, Scheidt H, Covey DF, Lehmann M, Wessig P, Obermaier S, Foster AJ, Poolman B, Werner S, Schneider G, Wüstner D

15:10-15:30 CEST



Correlative microscopy for imaging bacterial secretion systems

Fereshta Hafizi, Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany

Coffee break

15:30-16:00 CEST

Session III:

16:00-18:00 CEST

Chair: Dhruv Khatri

16:00-16:40 CEST



Cell Painting to accelerate drug discovery: finding disease phenotypes and candidate therapeutics using images

Anne Carpenter, Broad Institute of Harvard & MIT, Cambridge, MA, USA

presenting remotely

16:40-17:10 CEST



Modeling of intravenous caspofungin administration using an intestine-on-chip reveals altered *Candida albicans* microcolonies and pathogenicity

Tim Kaden & Parastoo Akbarimoghaddam; Dynamic42 GmbH & Leibniz Institute for Natural Product Research and Infection Biology – HKI Jena, Germany

Kaden T, Alonso-Román R, Akbarimoghaddam P, Mosig AS, Graf K, Raasch M, Hoffmann B, Figge MT, Hube B, Gresnigt MS

17:10-17:30 CEST



Unravelling the impact of interferon-immunotherapy on epithelial resistance to *Candida albicans* translocation

Beatriz Cristovao, Leibniz Institute for Natural Product Research and Infection Biology – HKI Jena, Germany

Cristovao B, Kirav Ö, Pekmezović M, Austermeier S, Cseresnyés Z, Figge MT, Gresnigt MS

17:30-18:00 CEST



Insights into *Vibrio cholerae* Biofilm Formation on Microplastics

Kerstin Thriene & Zoltan Cseresnyés, Leibniz Institute for Natural Product Research and Infection Biology – HKI, Jena, Germany

Thriene K, Cseresnyés Z, Huang Y, Sathe RRM, Figge MT, Hellmich UA, Stallforth P, Papenfort K

Dinner

18:00-19:00 CEST

Poster Session

19:00-21:00 CEST

Most (tandem) talks will also be presented as posters.

Advanced imaging tools and their application for data analysis

Aurélié Jost, Friedrich Schiller University Jena, Germany

Jost A, Then P, Neumann S, Eggeling C

Simulating elastic structures in image domains using deep learning approach

Anto Nivin Maria Antony, Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, Germany

Maria Antony AN, Narisetti N, Gladilin E

Image Processing is not a Magic Wand – or is it? – Image Quality Control Measurements for Systems Biology

Sophie Neumann, Friedrich Schiller University Jena, Germany

Neumann S, Jost A, Then P, Eggeling C

Image analysis of the adhesion of the probiotic strain *E. coli* Nissle to the fungal pathogen *C. albicans* using JIPipe

Carl-Magnus Svensson, Leibniz Institute for Natural Product Research and Infection Biology – HKI, Jena, Germany

Svensson CM, Chamas A, Maneira C, Figge MT, Lackner G

An open source super-resolution microscopy extension with real time reconstruction capability

Haoran Wang, Leibniz Institute of Photonic Technology – IPHT, Jena, Germany

Wang H, Heintzmann R, Diederich B

Automated classification of treatment response in tumour spheroid control probability (SCP) assays

Jannik Schmied & Willy Ciecior, HTW Dresden – University of Applied Sciences, Dresden, Germany

Schmied J, Ciecior W, Michlíková S, Kunz-Schughart LA, Lange S, Voß-Böhme A

The Microverse of the Plastisphere

Kerstin Thriene, Friedrich Schiller University Jena, Germany

Huang Y, Sathe RRM, Thriene K, Hellmich UA, Papenfort K, Stallforth P

Analysis of Skin Patterning with Particle Image Velocimetry

Rutian Zhou, Frankfurt Institute for Advanced Studies, Frankfurt, Germany

Zhou R, Marí MP, Riddell J, Painter KJ, Headon DJ, Matthäus F

Friday, 27/09/2024

Session IV:

09:00-10:20 CEST

Chair: Parastoo Akbarimoghaddam

09:00-09:40 CEST



Exploring Biological Shape Analysis with Statistics, Geometry, and Topology

Jon Sporring, University of Copenhagen, Denmark

09:40-10:00 CEST



KnotResolver: Tracking self-intersecting filaments in microscopy using directed graphs

Dhruv Khatri, Leibniz Institute for Natural Product Research and Infection Biology – HKI Jena, Germany

Khatri D, Yadav S, Athale CC

10:00-10:20 CEST



Quantifying morphodynamics in continuous space and time

Roua Rouatbi, Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG), Dresden, Germany

Rouatbi R, Suarez JE, Sbalzarini IF

Coffee break

10:20-10:50 CEST

Session V:

10:50-12:35 CEST

Chair: Carl-Magnus Svensson

10:50-11:30 CEST



Large language models for Bio-image Analysis

Robert Haase, Data Science Center, Leipzig University, ScaDS.AI Dresden / Leipzig, Germany

11:30-12:00 CEST



High-Throughput Detection of Microbial Growth and Antibiotic Resistance at the Single-Cell Level Using Scattered Light Imaging and Convolutional Neural Networks

Arjun Sarkar & Martina Graf, Leibniz Institute for Natural Product Research and Infection Biology – HKI Jena, Germany

Sarkar A, Graf M, Svensson CM, Munser AS, Hengoju S, Figge MT, Rosenbaum MA

12:00-12:15 CEST



JIPipe: FAIR image analysis without programming

Ruman Gerst, Leibniz Institute for Natural Product Research and Infection Biology – HKI Jena, Germany

Gerst R, Cseresnyés Z, Figge MT

12:15-12:35 CEST



OptiCell3D: a pipeline for inferring the mechanical properties of cells from 3D microscopy images

Kevin A. Yamauchi, Department of Biosystems Science and Engineering (BSSE), ETH Zurich, Switzerland

Yamauchi KA

Lunch break

12:35-13:30 CEST

Session VI:

13:30-15:00 CEST

Chair: Anastasia Solomatina

13:30-14:00 CEST



Tracking the dynamics of interacting microbial populations

Joel Ching & Silvia Vareschi, Friedrich Schiller University, Jena, Germany

Ching J, Vareschi S, Mauri M, Zander A, Herbst R, Schuster S, Stallforth P, Allen R

14:00-14:20 CEST



Morpheus: A user-friendly simulation framework for multi-cellular systems biology

Lutz Brusch, TUD Dresden University of Technology, Germany

Starruß J, Jahn D, Müller R, Brusch L

14:20-14:40 CEST



Porous-media characteristics of the developing tissue shape morphogen gradients

Justina Stark, Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG), Dresden, Germany

Stark J, Harish RK, Sbalzarini IF, Brand M

14:40-15:00 CEST



Nonlinear PDE models of intracellular virus replication dynamics evaluated upon realistic reconstructed grid geometries

Markus M. Knodel, Simulation in Technology – TechSim, Ölbronn-Dürrn, Germany

Knodel MM, Nägel A, Herrmann E, Wittum G

Closing of IbSB 2024

15:00-15:10 CEST