2022 Programme of the 4th International Conference
on Trauma Surgery Technology
This year's focus topic: Mathematics in Medical Diagnostics

Mathematics in Medical Diagnostic

In cooperation with
Deutsche Forschungsgemeinschaft (DFG)

Date 23 April 2022, start time 1 pm (CEST)

Location:
Max-Planck Dioscuri Centre in Topological Data Analysis,
Polish Academy of Sciences,
Institute of Mathematics
Sniadeckich 8
Warsaw, Poland

Virtual log in details on zoom:
https://us02web.zoom.us/j/3907697241?pwd=SmdlVCtGOXNnSnJXQ2VWU0V5c1NVQT09
Meeting ID: 390 769 7241
Passcode: 3EqzkF

Instructions for speakers

We are looking forward to your talk. Please aim to speak no longer than 15 min.

Sessions overview

Opening session
Starting 1 pm

- **Dlotko, Pawel, Dioscuri Centre for Topological Data Analysis, Warsaw, Poland**
  Welcome message, technical details and workshop structure
  How to see multiple clinical parameters acting together?
- **Group photo 2022 on zoom (participation non mandatory)**

Session 1 – Topological data analysis, Chair: Bosbach, Wolfram A
Starting 1.30 pm

- **Senge, Jan, Department of Mathematics and Computer Science, University of Bremen, Germany**
  Analysis of synchrotron images of human femoral heads and extraction of their topological characteristics
- **Hellmer, Niklas, Dioscuri Centre for Topological Data Analysis, Warsaw, Poland**
  Bottleneck Profiles and Prokhorov Metrics for Persistence Diagrams
- **Gurnari, Davide, Dioscuri Centre for Topological Data Analysis, Warsaw, Poland**
  Analysis of medical images using Euler characteristic curves (and profiles)

Coffee break 15 min

Session 2 – Non-TDA works, Chair: Dlotko, Pawel
Starting 2.45 pm

- **Tindall, Marcus J, Department of Mathematics and Statistics & Institute of Cardiovascular and Metabolic Research, University of Reading, UK**
  Mathematical modelling of bacterial chemotactic systems – The Rhodobacter sphaeroides case example
- **Burfitt, Matthew, Department of Mathematics, University Aberdeen, UK**
  A projective model for fast field cycling MRI images
- **Bosbach, Konstantin E, Medical Department, University of Freiburg, Germany**
  Investigating in vivo Detectability of the Neurotransmitter GABA in Magnetic Resonance Spectroscopy with the Monte Carlo method

Coffee break 15 min

Session 3 – Medical applications, Chair: TBD
Starting 4.00 pm

- **Bosbach, Wolfram A, Department of Diagnostic, Interventional and Paediatric Radiology (DIPR), Inselspital, Bern University Hospital, University of Bern, Switzerland**

VBA simulations of hospital operations – case study on Covid-19 vaccine rollout schemes

- **Ramedani, Saied, Graduate School of Cellular and Biomedical Sciences, University of Bern, Switzerland**
  Automated Evaluation of the Whole Body's Muscle-fat Composition by Machine Learning for Magnetic Resonance Images (MRI)
- **Maryanski, Marek, Institute of Nanotechnology and Material Science, Gdansk University of Technology, Poland**
  Towards automatic comparison between planned stereotactic radiosurgery dose distributions and those measured from high-definition 3D gel dosimetry images
- **Haupt, Fabian, Department of Diagnostic, Interventional and Paediatric Radiology (DIPR), Inselspital, Bern University Hospital, University of Bern, Switzerland**
  Educational presentation of state of the art imaging of congenital vascular malformations

Past events:

3ʳᵈ (virtual) conference: Multifunctional trauma surgery implants
DFG grant BO 4961/6-1
17 Oct 2020
Proceedings DOI [/10.17863/CAM.60559](https://doi.org/10.17863/CAM.60559)

2ⁿᵈ conference: Vibration in oncological and antibacterial therapy
DFG grant BO 4961/3-1
11 - 13 Oct 2019
Proceedings DOI [/10.17863/CAM.45844](https://doi.org/10.17863/CAM.45844)

1ˢᵗ conference: Patient centred technology design in traumatology
DFG grant BO 4961/4-1
16 - 18 Nov 2018
Proceedings DOI [/10.17863/CAM.34582](https://doi.org/10.17863/CAM.34582)