Opening remarks (Karol Miller, The University of Western Australia)

Session 1 (Part I): Computational Biomechanics of the Heart, Vascular System, Internal Organs and Cells

Keynote 1: A Multi-Level Model for the Prediction of Atherosclerotic Plaque Progression
Dimitrios I. Fotiadis\(^1,2\), Antonis Sakellarios\(^1,2\), Themis Exarchos\(^1,2\), Lambros K. Michalis\(^3\)
\(^1\)Unit of Medical Technology and Intelligent Information Systems, Department of Materials Science and Engineering, University of Ioannina, Ioannina, Greece;
\(^2\)Biomedical Research Institute – FORTH, University Campus of Ioannina, Ioannina, Greece;
\(^3\)Department of Cardiology, Medical School, University of Ioannina, Ioannina, Greece

Reduced order model of a human left and right ventricle based on POD method
Piotr Przybyła\(^1\), Witold Stankiewicz\(^1\), Marek Morzyński\(^1\), Michał Nowak\(^1\), Dominik Gawel\(^1\), Sebastian Stefaniak\(^1,2\), Marek Jemielity\(^1,2\)
\(^1\)Poznan University of Technology, Poland;
\(^2\)Cardio Surgery Department in Clinical Hospital of University of Medical Sciences, Poznan, Poland

10:30-11:00 Coffee Break

Session 1 (Part 2): Computational Biomechanics of the Heart, Vascular System, Internal Organs and Cells

Motion Estimation with Finite-Element Biomechanical Models and Tracking Constraints from Tagged MRI
Arnold David Gomez\(^1\), Fangxu Xing\(^2\), Deva Chan\(^3\), Dzung L. Pham\(^3\), Philip Bayly\(^4\), and Jerry L. Prince\(^1\)
\(^1\)Johns Hopkins University, Baltimore, USA;
\(^2\)Massachusetts General Hospital/Harvard Medical School, Boston, USA;
\(^3\)Center for Neuroscience and Regenerative Medicine, Henry Jackson Foundation, Bethesda, USA;
\(^4\)Washington University in St. Louis, St. Louis, USA

Estimation of the Permeability Tensor of the Microvasculature of the Liver through Fabric Tensors
Rodrigo Moreno\(^1\), Patrick Segers\(^2\) and Charlotte Debbaut\(^2\)
\(^1\)KTH Royal Institute of Technology, Sweden;
\(^2\)Institute Biomedical Technology (IBiTech), Ghent University, Belgium
12:00-12:30  **Three-dimensional glenohumeral joint kinematic analyses from asynchronous biplane fluoroscopy using an interpolation technique**
Mohsen Akbari-Shandiz, Joseph D. Mozingo, David R. Holmes III, and Kristin D. Zhao
Mayo Clinic, Rochester, MN, USA

12:30-13:00  **Quantifying Cytoskeletal Morphology in Endothelial Cells to Enable Mechanical Analysis**
Yi Chung Lim¹, Detlef Kuhl¹, Michael T. Cooling², David S. Long²,³
¹University of Kassel, Kassel, Germany; ²Auckland Bioengineering Institute, Auckland, New Zealand; ³University of Auckland, Auckland, New Zealand

13:00 – 14:00 Lunch

14:00-15:10 Poster Session

**Computational Biomechanics of the Heart, Vascular System, Internal Organs and Cells**

**Constitutive Modelling of Lamb Aorta**
Ryley A. Macrae¹, Jane Pillow¹, Karol Miller¹,², Barry J. Doyle¹,³,⁴
¹The University of Western Australia, Perth, Western Australia, Australia; ²Institute of Mechanics and Advanced Materials, Cardiff University, UK; ³Harry Perkins Institute of Medical Research, Perth, Western Australia, Australia; ⁴British Heart Foundation Centre for Cardiovascular Science, The University of Edinburgh, UK;

**The effects of geometric variation from OCT-derived 3D reconstructions on wall shear stress in a patient-specific coronary artery**
Lachlan J. Kelsey¹,², Carl Schultz²,³, Karol Miller²,⁴ and Barry J. Doyle¹,²,⁵
¹Harry Perkins Institute of Medical Research, Perth, Western Australia, Australia. ²The University of Western Australia, Perth, Australia; ³Royal Perth Hospital, Perth, Western Australia, Australia; ⁴Institute of Mechanics and Advanced Materials, Cardiff University, UK; ⁵British Heart Foundation Centre for Cardiovascular Science, The University of Edinburgh, UK;

**Computational Biomechanics for Medical Image Registration, Soft Tissue Biomechanics, Tissue Damage and Injury Biomechanics**

**Registration of Prone and Supine Breast MRI for Breast Cancer Treatment Planning**
Thiranja P. Babarenda Gamage¹, Habib Y. Baluwala¹, Martyn P. Nash¹,², Poul M.F. Nielsen¹,²
¹Auckland Bioengineering Institute (ABI), Auckland, New Zealand; ²The University of Auckland, Auckland, New Zealand
Computation of Brain Deformations Due to Violent Impact: Quantitative Analysis of the Importance of the Choice of Boundary Conditions and Brain Tissue Constitutive Model

Fang Wang¹, Zhengyang Geng¹, Sudip Agrawal², Yong Han¹, Karol Miller²,³, Adam Wittek²
¹Xiamen University of Technology, Xiamen, China; ²Intelligent System for Medicine Laboratory, The University of Western Australia, Western Australia, Perth, Australia;
³Institute of Mechanics and Advanced Materials, Cardiff University, Wales, UK

Abusive head trauma – modelling the adult head to predict brain deformations under mild accelerations

Nikini T. Puhulwelle Gamage¹, Andrew K. Knutsen², Dzung L. Pham², Andrew J. Taberner¹,³, Martyn P. Nash¹,³, and Poul M. F. Nielsen¹,³
¹Auckland Bioengineering Institute (ABI), Auckland, New Zealand;
²Center for Neuroscience and Regenerative Medicine, The Henry M. Jackson Foundation, Bethesda, MD, USA; ³The University of Auckland, Auckland, New Zealand

Subpixel Measurement of Living Skin Deformation Using Intrinsic Features

Amir HajiRassouliha ¹, Andrew J. Taberner¹, ², Martyn P. Nash¹, ², and Poul M. F. Nielsen¹, ²
¹Auckland Bioengineering Institute (ABI), Auckland, New Zealand;
²The University of Auckland, Auckland, New Zealand

Session 2 (Part I): Computational Biomechanics for Medical Image Registration, Soft Tissue Biomechanics, Tissue Damage and Injury Biomechanics

15:10-16:00 Keynote 2: Lower Leg Elastic Compression: From Device Interaction to Biomechanical Action

Pierre Badel¹,²,³, Stéphane Avril¹,²,³, Jérôme Molimard¹,²,³
¹Ecole Nationale Supérieure des Mines de Saint-Etienne, CIS-EMSE, SAINBIOSE, Saint Etienne, France;
²Inserm, U1059, Saint-Etienne, France;
³Université de Lyon, SAINBIOSE, Saint Etienne, France

16.00-16.30 Coffee Break
Session 2 (Part II): Computational Biomechanics for Medical Image Registration, Soft Tissue Biomechanics, Tissue Damage and Injury Biomechanics

16:30-17:00 An Evaluation of Adaptive Biomechanical Non-Rigid Registration for Brain Glioma Resection using Image-Guided Neurosurgery
Fotis Drakopoulos¹, Chengjun Yao², Yixun Liu¹, and Nikos Chrisochoides¹
¹Old Dominion University, Norfolk, VA, USA; ²Huashan Hospital, Shanghai, China

17:00-17:30 Evaluation of strains on levator ani muscle: damage induced during delivery for a prediction of patient risks
Olivier Mayeur¹, ², Estelle Jeanditguatier², ³, ⁴, Jean-Francois Witz¹, ², Pauline Lecomte – Grosbras¹, ², Michael Cosson², ³, ⁴, Chrystele Rubod², ³, ⁴, Mathias Brieu¹, ²
¹Centrale Lille, France; ²Laboratoire de Mécanique de Lille, Lille, France; ³CHU Lille, Service de Chirurgie Gynécologique, Lille, France; ⁴Université Lille Nord de France, Lille, France

17:30-17:50 CBM Best Paper Award and Concluding Remarks (Karol Miller, The University of Western Australia)