PROGRAMME OF MICCAI 2016 WORKSHOP: COMPUTATIONAL BIOMECHANICS FOR MEDICINE XI (CBM XI)

October 17, 2016

9:00-9:10 ***Opening remarks*** (Karol Miller, The University of Western Australia)

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

9:10-10:00 ***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

10:00-10:30 ***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 Gaweł[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

11:00-11:30 ***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

11:30-12:00 ***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 Lim[1], Detlef Kuhl[1], Michael T. Cooling[2], David S. Long[2,3]

[1]University of Kassel, Kassel, Germany; [2]Auckland Bioengineering Institute, Auckland, New Zealand; [3]University 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. Macrae[1], Jane Pillow[1], Karol Miller[1,2], Barry J. Doyle[1,3,4]

[1]The University of Western Australia, Perth, Western Australia, Australia;
[2]Institute of Mechanics and Advanced Materials, Cardiff University, UK;
[3]Harry Perkins Institute of Medical Research, Perth, Western Australia, Australia;
[4]British 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. Kelsey[1,2], Carl Schultz[2,3], Karol Miller[2,4] and Barry J. Doyle[1,2,5]

[1]Harry Perkins Institute of Medical Research, Perth, Western Australia, Australia.

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[6]British 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 Gamage[1] , Habib Y. Baluwala[1] , Martyn P. Nash[1,2], Poul M.F. Nielsen[1,2]

[1]Auckland Bioengineering Institute (ABI), Auckland, New Zealand;
[2]The 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 Wang[1], Zhengyang Geng[1], Sudip Agrawal[2], Yong Han[1], Karol Miller[2, 3], Adam Wittek[2]
[1]Xiamen University of Technology, Xiamen, China; [2]Intelligent System for Medicine Laboratory, The University of Western Australia, Western Australia, Perth, Australia;
[3]Institute 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 Gamage[1], Andrew K. Knutsen[2], Dzung L. Pham[2], Andrew J. Taberner[1,3], Martyn P. Nash[1,3], and Poul M. F. Nielsen[1,3]
[1]Auckland Bioengineering Institute (ABI), Auckland, New Zealand;
[2]Center for Neuroscience and Regenerative Medicine, The Henry M. Jackson Foundation, Bethesda, MD, USA; [3]The University of Auckland, Auckland, New Zealand

Subpixel Measurement of Living Skin Deformation Using Intrinsic Features

Amir HajiRassouliha[1], Andrew J. Taberner[1, 2], Martyn P. Nash[1, 2], and Poul M. F. Nielsen[1, 2]
[1]Auckland Bioengineering Institute (ABI), Auckland, New Zealand;
[2]The 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 Badel[1, 2, 3], Stéphane Avril[1, 2, 3], Jérôme Molimard[1, 2, 3]
[1]Ecole Nationale Supérieure des Mines de Saint-Etienne, CIS-EMSE, SAINBIOSE, Saint Etienne, France;
[2] Inserm, U1059, Saint-Etienne, France;
[3]Université 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 Drakopoulos[1], Chengjun Yao[2], Yixun Liu[1], and Nikos Chrisochoides[1]

[1]Old Dominion University, Norfolk, VA, USA;

[2]Huashan 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 Mayeur[1, 2], Estelle Jeanditguatier[2, 3, 4], Jean-Francois Witz[1, 2], Pauline Lecomte – Grosbras[1, 2], Michael Cosson[2, 3, 4], Chrystele Rubod[2, 3, 4], Mathias Brieu[1, 2]

[1]Centrale Lille, France; [2]Laboratoire de Mécanique de Lille, Lille, France;
[3]CHU Lille, Service de Chirurgie Gynécologique, Lille, France;
[4]Université Lille Nord de France, Lille, France

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