PROGRAMME OF MICCAI 2020 WORKSHOP: COMPUTATIONAL BIOMECHANICS FOR MEDICINE XV (CBM XV)

Note: Universal Time UTC is used the Programme. All presentations will be via Zoom.

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

Session 1 (Part I): Computational Biomechanics Frameworks and Models for Computer-Assisted Therapy and Understanding of Disease Mechanisms

9:10 -10:00 ***Keynote: From simulation based design to simulation based treatment***

Ludek Hyncik[1]
[1]University of West Bohemia, Pilsen, Czech Republic

10:00 -10:30 ***Automatic framework for patient-specific biomechanical computations of organ deformation***

Saima Safdar[1], Grand Joldes[1], Benjamin Zwick[1], George Bourantas[1], Ron Kikinis[2], Adam Wittek[1], and Karol Miller[1]
[1]Intelligent Systems for Medicine Laboratory, The University of Western Australia, Perth, Western Australia, Australia
[2]Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

10:30 – 11:00 Break

Session 1 (Part II): Computational Biomechanics Frameworks and Models for Computer-Assisted Therapy and Understanding of Disease Mechanisms

11:00 -11:30 ***Characterising the soft tissue mechanical properties of the lower limb of a below-knee amputee: a review***

Seyed Sajad Mirjavadi[1], Andrew J. Taberner[1,2], Martyn P. Nash[1,2], Poul M. F. Nielsen[1,2]
[1]Auckland Bioengineering Institute, University of Auckland, New Zealand
[2]Department of Engineering Science, University of Auckland, New Zealand

11:30 -12:00 ***Computer simulation of the resection induced brain shift; Preliminary results***

Yue Yu[1], George Bourantas[1], Tina Kapur[2], Sarah Frisken[2], Ron Kikinis[2], Arya Nabavi[3], Alexandra Golby[2], Adam Wittek[1], and Karol Miller[1]
[1]Intelligent systems for Medicine Laboratory, Perth, Western Australia, Australia;
[2]Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA;
[3]Department of Neurosurgery, Nordstadt Hospital, Klinikum Nordstadt, Hannover, Germany

12:00 -12:30 ***Mandibular teeth movement variations in tipping scenario: A finite element study on several patients***

Torkan Gholamalizadeh[1,2], Sune Darkner[2], Paolo Maria Cattaneo[3], Peter Søndergaard[1] , and Kenny Erleben[2]
[1]3Shape A/S, Copenhagen, DK,
[2]Department of Computer Science, University of Copenhagen, Copenhagen, DK,
[3]Department of Dentistry and Oral Health, Aarhus University, Aarhus, DK

12:30 – 14:00 Break

Session 2: Biomechanical tissue characterisation, determining organ geometry, and organ deformation measurements

14:00-14:30 ***An unsupervised learning based deformable registration network for 4D-CT: Analysis and application***

Dongming Wei[1] and Wenlong Yang[1], Pascal Paysan[1], Hefeng Liu[1]
[1]Varian Medical Systems, Inc., Palo Alto, CA, USA

14:30-15:00 ***3D reconstruction of patient-specific carotid artery geometry using clinical ultrasound imaging***

Tijana Djukic[1,2], Branko Arsic[2,3], Igor Koncar[4], Nenad Filipovic[5]
[1]Institute for Information Technologies, University of Kragujevac, Serbia
[2]Bioengineering Research and Development Center, BioIRC, Kragujevac, Serbia
[3]Faculty of Science, University of Kragujevac, Serbia
[4]Clinic for Vascular and Endovascular Surgery, Serbian Clinical Centre, Belgrade, Serbia
[5]Faculty of Engineering, University of Kragujevac, Serbia

15:00-15:30 ***Feasibility of using Freehand Ultrasound imaging to measure anatomical features of the Ischial Tuberosity to improve the prevention of seating-related pressure injury: US-based versus EOS-based assessment***

A.Berriot[1], N. Fougeron[1], X..Bonnet[1], H. Pillet[1], and P.Y. Rohan[1]
[1]Institut de Biomécanique Humaine Georges Charpark, Arts et Metiers ParisTech, Paris, France

15:30-16:00 ***3D Brain Deformation in cadaveric specimens compared to healthy volunteers under non-injurious loading conditions***

Andrew K. Knutsen[1], Philip V. Bayly[2], John A. Butman[3], Dzung L. Pham[1]
[1]Center for Neuroscience and Regenerative Medicine, The Henry M Jackson Foundation, Bethesda, MD, USA
[2]Department of Mechanical Engineering and Materials Science, Washington University in St. Louis, Missouri, USA
[3]Clinical Center, National Institutes of Health, Bethesda, Maryland, USA