

PMHA Workshop - Jan 28 - 29, 2013

1st International Workshop on Biomechanical and Parametric Modeling of Human Anatomy

Sunday Jan 27th, 2013

Opening Cocktail

5:00 - 7pm Welcome Reception (wine and cheese)

Monday June 28th, 2013

Sessions (8:00am-6pm)

Location: **Empire Landmark Hotel and Conference Centre, Conference room** unless otherwise indicated

8:00-9:00 **Breakfast and Registration**

9:00-9:30 **Greetings and Introduction**

9:00-9:15 Welcome to PMHA - Development of 3D Biomechanical Models of Human Activity **Fels**
9:15-9:30 Each participant introduces themselves **Everyone**

9:30-10:30 **Session 1: Building a Shared Parametric Human Model Database**

9:30 - 9:50 Parametric Human Project Scope and Vision **Khan**
9:50 - 10:10 Creating and sharing models of human physiology **Nielsen**
10:10- 10:30 Towards the development of a biomechanical ontology to support the initiatives of the Parametric Human Model Database **Bibliowicz, Mogk and Khan**

10:30 - 11:00 **Coffee break and discussions**

11:00 - 12:20 **Session 2: Modeling Techniques and Tools**

11:00 - 11:20 Lagrangian Biomechanics in ArtiSynth **Lloyd**
11:20 - 11:40 Eulerian Biomechanics **Pai**
11:40 - 12:00 The finite-element muscle modelling cookbook, and the importance of fibers **Sanchez** and Lloyd
12:00 - 12:20 Simulation of collapsible tubes and airways **Anderson, Fels** and Green

12:20 - 1:30 **Lunch and Discussion in meeting room**

1:30 - 2:30 **Session 3: Medical Imaging Processing and Scanning Towards Biomechanical Modeling**

1:30 - 1:50 Building a Multi-subject Vocal Tract Atlas using Structural MR Images **Woo, Lee, Murano, Xing, Stone** and Prince
1:50 - 2:10 Spine segmentation based on a shape-matching registration algorithm **Suzani** and Aboulmaesumi
2:10 - 2:30 Real-time 3D Segmentation of Human Tongue from Isotropic MRI Volumes: Force-based User Interaction **Harandi, Abugharbieh** and Fels
2:30 - 2:50 Development of an architecturally comprehensive database of forearm flexors and extensors from MRI **Li, Bibliowicz, Mogk** and Agur
2:50 - 3:10 A Statistical Multi-vertebrae Shape+Pose Model for Segmentation of CT Images **Rasoulian, Rohling** and Abolmaesumi

3:10 - 3:30 **Coffee Break & Discussion**

3:30 - 5:10 **Session 4: Modeling Challenges for the Head and Neck**

3:30 - 3:50 Dysphagia in Traumatically Wounded or Injured US Military Service Members **Solomon, Cord, Dietrich-Burns, Dietsch** and Grant
3:50 - 4:10 The Application of Advanced Digital Technologies in Reconstruction of the Jaws **Wolfaardt**
4:10 - 4:30 Morphometric Analysis of the Swallowing Apparatus **Pearson**
4:30 - 4:50 Quantitative Analysis of Vocal Tract Coordination using Correlation Map Analysis **Barbosa, Belzile, de Vries** and Vatikiotis-Bateson
4:50 - 5:10 A PCA Comparison of normal and glossectomy productions of /s/. **Stone, Woo, Ding, Gallagher, Chen** and Prince
tentative 5:10-5:20 The Development of a Program for HQP in Surgical Design and Simulation (SDS) for Head and Neck Reconstruction **Wolfaardt**

5:10 - 6:00 **Discussion**

5:10 - 6:00 **What's new in Artisynt Demonstration and Tutorial**

7:30-8:30 **Dinner** Cloud 9 Restaurant, top floor, Empire Landmark Hotel and Conference Centre, Conference room

Tuesday Jan 29th, 2013

8:00-9:00 **Breakfast**

9:00-10:00 **Session 5: Swallowing Modeling**

9:00 - 9:20 Mapping Dysphagia Phenotypes Using Videofluoroscopic Imaging: Implications for Dynamic Modeling **Martin-Harris**
9:20 - 9:40 A 3D swallowing simulation using Smoothed Particle Hydrodynamics **Ho, Green** and Fels
9:40 - 10:00 A three-dimensional computer simulation of velopharyngeal closure **Kwon, Tsou, Flynn, Sanchez, Lloyd, Ho** and Fels
10:00 - 10:20 Validation Strategies for Simulation of Oropharyngeal Fluid Mechanics **Nicosia**

10:20 - 11:00 **Discussion + coffee**

11:00 - 12:20 **Session 6: Applications of Human Biomechanical Modeling from Foot to Head**

11:00 - 11:20 Foot ulcer prevention using biomechanical modeling **Luboz, Perrier, Stavness, Lloyd, Bucki, Cannard, Diot, Vuillerme** and Pavan
11:20 - 11:40 *Movement Sonification for Training Athletes* **Godbout** and Boyd
11:40 - 12:00 Seatback Rotational Control Reduces Whiplash Injury Potential: A Preliminary Computational Study **Fice, Biouin** and Siegmund
12:00 - 12:20 Speech function of the oropharyngeal isthmus: A modeling study **Gick, Anderson, Chen, Chiu, Kwon, Stavness, Tsou** and Fels

12:20 - 1:30 **Lunch and Discussion in meeting room**

1:30 - 2:50 **Session 7: Human Muscle Modeling**

1:30 - 1:50 Towards a Multi-Pennate Finite-Element Model of the Masseter Muscle **Hannam, Stavness, Sanchez, Biquey, Ebrahimi** and Agur
1:50 - 2:10 Towards a Multi-Compartment Finite-Element Model of the Supraspinatus Muscle **Stavness** and Kim
2:10 - 2:30 Estimating muscle fibre contractile activity of the tongue during swallowing using microstructure **Wang, Gamage, Kieser, Nielsen, Röhrlé** and Nash
2:30 - 2:50 Biomechanical Human Modeling of Muscles, Hands and Faces **Fiume**

2:50 - 3:30 **Coffee Break & Discussion**

3:30 - 5:00 **Session 8: Biomechanical Modeling for Education**

Anatomical Simulation: Issues and Challenges

3:40 - 3:50 Importance of Instruction in the Functional anatomy and Physiology (**Martin-Harris**) **Issues and Challenges for Anatomical Simulation: Lloyd**
3:50 - 4:00 Toward eScience for Anatomical Simulation (**Khan**) **In vivo soft tissue characterization, Luboz**
4:00 - 4:10 Using Models of Craniofacial and Oropharyngeal Function in Teaching (**Miller**) **Lessons and Criticisms from Biomechanical Modeling: Accuracy, Clinical validation and beyond - Fiume**
4:10 - 5:00 **Discussants: Hannam, Khan, Martin-Harris, Miller** **Discussants: Lloyd, Stavness, Pai, Luboz, Nielsen, Fiume**

Unscheduled presentations

Evaluating Shape Changes Generated by a Two-Sling Mechanism of Hyolaryngeal Elevation in Swallowing **Pearson**
Progress on a Mandibular Model **Rieger**

5:00 - 6:00 **Discussion and Next steps**

6:30-? **informal drinks and/or dinner**