

Fifth Soft Tissue Modelling Workshop

Venue: on-line

Plenary Talk: 35 mins + 5 mins question

Regular Talk: 17 mins + 3 mins question

Programme

Day 1

Tuesday 1 June 2021

09:20 09:30 House-keeping (ICMS: Liam Holligan) + Welcome (Professor Mark Chaplain)

Morning Session-1 Chair: Hao Gao

Cardiac Modelling

09:30	10:10	Professor Alexander Panfilov	<i>Mechano-electric feedback and initiation of cardiac arrhythmias</i>
10:10	10:30	Alessio Gizzi	<i>Thermo-electro visco-elastic modeling of the heart with nonlinear diffusion</i>
10:30	10:50	Marco Fedele	<i>Patient-specific image-based cardiac hemodynamics simulations: a novel pipeline to process cardiac cine-MRI</i>
10:50	11:10	Namshad Thekkethil	<i>A New Stabilized Implicit Finite Element Method for the Poroelastodynamics in Cardiac Perfusion</i>
11:10	11:40	Coffee break	

Morning Session-2 Chair: Professor Alexander Panfilov

11:40	12:00	Ivan Fumagalli	<i>An image-based computational fluid dynamics analysis of hypertrophic cardiomyopathy</i>
12:00	12:20	Nicolas Alejandro Barnafi	<i>A novel computational model for cardiac poromechanics</i>
12:20	12:40	Hao Gao	<i>An initial experience of constrained mixture based cardiac growth and remodelling</i>
12:40	13:00	Michelle Bartolo	<i>Multiscale hemodynamic predictions in the pulmonary vasculature</i>

13:00 14:00 Lunch

Afternoon Session-1 Chair: Prof. Alexandar Movchan

Multiscale Modelling

14:00	14:40	Professor Raffaella Ocone	<i>From Applications to Fundamentals –the power of multiscale modelling</i>
14:40	15:00	Tom Shearer	<i>A microstructural model of tendon failure</i>
15:00	15:20	Helena Raymond-Hayling	<i>Structure-function relationship in mammalian tendons: modelling of tendon stress response directly from microstructural data</i>
15:20	15:40	Robyn Shuttleworth	<i>General mass tissue transfer model for cryopreservation applications</i>
15:40	16:00	Laura Miller	<i>Double poroelasticity derived from the microstructure</i>
16:00	16:20	Cristina Falcinelli	<i>A statistical framework of growth and remodeling in fiber-reinforced tissues</i>

16:20 17:20 Social (19th Hole)

Day 2

Wednesday 2nd June

Morning Session-1 Chair: Namshad Thekkethil

Respiration and Circulation

09:30	10:10	Dr Bindi Brook	<i>Structure, function and growth in asthmatic airways</i>
10:10	10:30	Sumit Mehta	<i>Wrinkling instabilities in a growing hyperelastic plate</i>
10:30	10:50	Alexander Greiner	<i>Poro-viscoelastic effects during biomechanical testing of human brain tissue</i>
10:50	11:10	Liuyang Feng	<i>Fluid-structure interaction in a fully coupled three-dimensional mitral-atrium-pulmonary model</i>

11:10 11:40 Coffee break

Morning Session-2 Chair: Dr Bindi Brook

11:40	12:00	Anna Ramella	<i>Development of a FSI analysis to model the TEVAR procedure</i>
12:00	12:20	Alan Lazarus	<i>Parameter estimation and uncertainty quantification in a mathematical model of the left ventricle</i>
12:20	12:40	Mohammad Ahmad	<i>Modeling and validation of the elasticity parameters of multi-layer specimens pertinent to silicone vocal fold replicas</i>
12:40	13:00	Mihaela Paun	<i>Inference in cardiovascular modelling subject to medical interventions</i>

13:00 14:00 Lunch

Afternoon Session-1 Chair: Prof. Mark Chaplain

Cancer

14:00	14:40	Professor Dirk Drasdo	<i>Quantitative single-cell-based modeling reveals predictable response of growing tumor spheroids on external mechanical stress, and how this informs a virtual liver twin</i>
14:40	15:00	Nikolaos Sfakianakis	<i>A genuinely hybrid 2- and 3-D local and multi-organ cancer invasion and metastasis framework</i>
15:00	15:20	Raimondo Penta	<i>Effective balance equations for elastic composites subject to inhomogeneous potentials</i>
15:20	15:40	Ariel Ramirez Torres	<i>A model for the non-local evolution of chemical species in a growing tumour</i>
15:40	16:00	Harold Berjamine	<i>Nonlinear acceleration waves in soft porous tissues</i>

Coffee break 16.00-16.30

Poster Session 16.30 - 17.30

The poster session will begin with short one minute presentations from the poster delegates

Poster Session Programme

Gordon McNicol *Self-excited oscillations in flow through a flexible-walled channel with a heavy wall*

Chair: Raimondo Penta

Sathish Kumar *Effects of arterial wall constitutive models in stent-graft deployment simulations*

Tahani Mohammed Sulaiman Al Sariri *Multi-scale modelling of Nanoparticle delivery and heat transport in vascularised tumours.*

Ifeanyi Sunday Onah *Predicting the onset of retinal haemorrhage*

Debao Guan *A new active contraction model for myocardium using a modified hill model*

Hammed O. Fatoyinbo *Pattern Formation in a Model of Electrically Coupled Smooth Muscle Cells*

Jude Hussain *Representative Human Artery Models for Stent Durability Assessment*

Day 3

Thursday 3 June

		Mechanobiology		
Morning Session-1 Chair: Nikolaos Sfakianakis	09:10	09:30	Chiara Villa	<i>Mechanical models of pattern and form in biological tissues: the role of stress-strain constitutive equation</i>
	09:30	10:10	Professor Liesbet Geris	<i>Connecting Mechanics and Biology in a multiscale model of osteoarthritis</i>
	10:10	10:30	Hadrien Oliveri	<i>An optic ray theory for nerve durotaxis</i>
	10:30	10:50	Travis Thompson	<i>Maths, Mechanisms and Models in Network Neurodegeneration</i>
	10:50	11:10	Radostin Simitev	<i>Understanding arrhythmogenesis due to myocyte-fibroblast coupling in atrial tissues</i>
	11:10	11:40	Coffee break	
Morning Session-2 Chair: Prof. Liesbet Geris	11:40	12:00	Marcello Vasta	<i>A microstructural degeneration model of the human cornea</i>
	12:00	12:20	Peter Stewart	<i>Elastic jumps on networks - towards a mathematical framework for predicting retinal haemorrhage</i>
	12:20	13:00	Professor Alexander Movchan	<i>Eigenvalue problems in the dynamics of fluid-solid biological systems</i>
Prize giving: Prof. Nicholas Hill	13:00	13:05	Best presentation awards for PhD students	
Open Discussion: Prof. Mark Chaplain	13:05	13:25	Open discussion	