

Sixth Soft Tissue Modelling Workshop 7th - 9th June 2023 Programme

Venue: Room 745 James Smith McClure Learning Hub, university of Glasgow

Plenary Talk: 35 mins + 5 mins question

Regular Talk: 17 mins + 3 mins question

ECR presentations are marked in purple

PhD presentations are marked in blue

Day 1

Wednesday 7 June 2023

REGISTRATION IS IN THE WOLFSON MEDICAL BUILDING just across from the James McCune FROM 8.30 to 9.10am

09:20 09:30 Welcome - Nick Hill

Morning Session-1 Chair: Nicholas Hill

THEME: Cells

09:30 10:10 Roger Kamm The Role of Mechanobiology in Vasculogenesis

10:10 10:30 Namshad Thekktihil *Poroelectric and Viscoelastic behaviour of living cytoplasm: Mathematical modelling and numerical Simulations using an upscaled constitutive law*

10:30 10:50 Namrata Gundiah *Endothelium-on-chip device for vascular dysfunction: it takes two to tango*

10:50 11:10 Gordon McNicol *A one-dimensional continuum model for focal adhesion and ventral stress fibre formation*

11:10 11:40 TEA BREAK in the Wolfson Medical Building where you registered

Morning Session-2 Chair: Hao Gao

THEME: Fluid Structure Interactions

11:40 12:00 Peter Stewart *Self-excited oscillations in flow over the vocal folds*

12:00 12:20 Danyang Wang *Instabilities in a collapsible channel flow*

12:20 12:40 Paul Watton *A constrained mixture-micturition-growth (CMMG) model of the urinary bladder: Application to partial bladder outlet obstruction (BOO)*

12:40 14:00 LUNCH BREAK: Please choose from outlets on the ground floor or surrounding area

EARLY CAREER RESEARCHER LUNCH: Studio 2 Advanced Research Centre: 12.50 - 13.50

Afternoon Session-1 Chair: Namrata Gundiah

THEME: Tissue Microstructure

14:00 14:40 Anna Pandolfi *A stochastic model of the collagen microstructure*

14:40 15:00 Tom Shearer *Bayesian inference on a microstructural, hyperelastic model of tendon deformation*

15:00 15:20 Calum Anderson *Computational homogenization of histological microstructures in human prostate and cancer*

15:20 15:40 Mahmood Abdallah Saleh *Detecting Tumour nodules in Soft Tissues using Multi-Modal Mechanical Characterisations - A Hybrid Approach with Experimental, Analytical and Computational Studies*

15:40 16:00 Jakub Koery *Multiscale framework for estimating force response of cytoskeleton during intracellular transport*

16:00 17:20 POSTER SESSION Begins with flash talks in the Lecture Theatre and then moves to the Wolfson Medical Building for Poster viewing and Afternoon Tea

Poster Session Chair: Laura Miller

POSTERS

Atrayee Bhattacharya *Predicting Retinal Haemorrhage following Retinal Vein Occlusion*

David Dalton *Physics-Informed Graph Neural Network Emulation of Soft-Tissue Mechanics*

Ciara B. Durcan *Ex vivo experimental investigations and constitutive modelling of the layer-dependent mechanical behaviour of the human oesophagus*

Mariam Al Mudarra *Avascular tumour growth with fractional order non-Fickian diffusion*

Dirk Husmeier *Closed loop effects in modelling pulmonary hypertension*

Alejandro Roque-Piedra *Non-linear homogenised viscoelastic media via an asymptotic homogenisation approach*

Zita Borbala Fulop *Multiscale modelling of fluid transport in vascular tumours subjected to electrophoresis anti-cancer therapies*

Antesar Mohammed A Al dawoud *Stepwise regression for estimation of parameters in electrophysiological ventricular myocyte models*

Alan Lazarus *Surrogate modelling for efficient parameter estimation in cardiac models*

Sathish Kumar Marimuthu *Optimisation of stent grafts to treat aortic dissection*

Yangkun Du *Nonlinear Indentation of Second-order Hyperelastic Materials*

Day 2

Thursday 8th June

Morning Session-1 Chair: Raimondo Penta

THEME: Continuum Models

09:00 09:40 Gerhard Holzapfel *Multiscale Modeling of Collagenous Tissues: Connecting Phenomena at the Nano, Micro and Macro Levels*

09:40 10:00 Laura Miller *Investigating the effects of microstructural changes induced by myocardial infarction on the elastic parameters of the heart*

10:00 10:20 Francesca Ballatore *Modelling brain tumour growth and its impact on the surrounding tissue: a Continuum Mechanics approach*

10:20 10:40 Xiaoyu Luo *Volumetric growth law in the current configuration*

10:40 11:20 COFFEE BREAK Wolfson Medical Centre

Morning Session-2 Chair: Anna Pandolfi

THEME: Vascular Disease

11:20 11:40 Francesco Migliavacca *Modeling the thrombectomy procedure: a pathway towards in silico trials*

11:40 12:00 Jay Mackenzie *Visualisation of and fluid simulation in patient specific coronary vessel networks*

12:00 12:20 Yangkun Du *Nonlinear Indentation of Second-order Hyperelastic Materials*

Afternoon Session-1 Chair: Dirk Husmeier	12:20	12:40	Lei Wang	<i>Towards high-fidelity and efficient computation for diagnosis and treatment of cardiovascular disease</i>
	12:40	13:00	Andrew Brown	Multiscale Modelling Of Aortic Dissection Via Asymptotic Homogenisation Of A Damage Phase Field Model
	13:00	14:00	LUNCH BREAK:	Please choose from outlets on the ground floor or surrounding area
	THEME: Statistical Methods			
	14:00	14:40	Richard Clayton	<i>Sensitivity analysis and calibration of cardiac models using emulators</i>
Afternoon Session-2 Chair: Paul Watton	14:40	15:00	Yuzhang Ge	<i>Estimation of the specific biophysical parameters of a cardiac mechanics model using a time series of variables that can be acquired in the clinic</i>
	15:00	15:20	Mihaela Paun	<i>Constrained Bayesian optimisation with an application to drug-delivery from stents</i>
	15:20	16:00		Coffee & group photograph at the Wolfson
	THEME: Cardiovascular Modelling			
	16:00	16:20	Luca Dede	<i>Multiphysics, multiscale, and computational models for simulating the cardiac function</i>
	16:20	16:40	Christian Vergara	<i>Cardiac blood dynamics and perfusion: modeling, numerics and applications</i>
	16:40	17:00	Liyang Feng	<i>Whole-Heart Modelling With Fluid-Structure Interactions</i>
<i>The Conference Dinner will be held at the Hilton Grosvenor at 7pm</i>				
Day 3				
Friday 9th June				
Morning Session-1 Chair: Francesco Migliavacca	THEME: Cardiovascular Modelling			
	09:00	09:40	Patrick McGarry	<i>Modelling the active contractility of cells and soft tissue</i>
	09:40	10:00	Mark Danton	<i>The Right Ventricle in Congenital Heart Disease: Mechanism of failure and modelling insights</i>
	10:00	10:20	Hao Gao	<i>An Updated Lagrangian Constrained Mixture Model of Pathological Cardiac Growth and Remodelling</i>
	10:20	10:40	Debao Guan	<i>A Modelling Study of Pulmonary Regurgitation in a Personalized Human Heart</i>
10:40 11:20 COFFEE BREAK in Room 116 Maths & Stats				
Morning Session-2 Chair: Roger Kamm	11:20	11:40	Dirk Husmeier	<i>Closed loop effects in modelling pulmonary hypertension</i>
	11:40	12:00		
	12:00	12:20	Pradeep Keshavanarayana	<i>On the role of shear stress on vascular permeability - An in-silico study</i>
	12:20	13:00	Colin Berry	<i>Modelling heart injury</i>