INSIGNEO
Institute for *in silico* Medicine

The University Of Sheffield.

Sheffield Teaching Hospitals NHS
NHS Foundation Trust

Insigneo Newsletter - November 2021

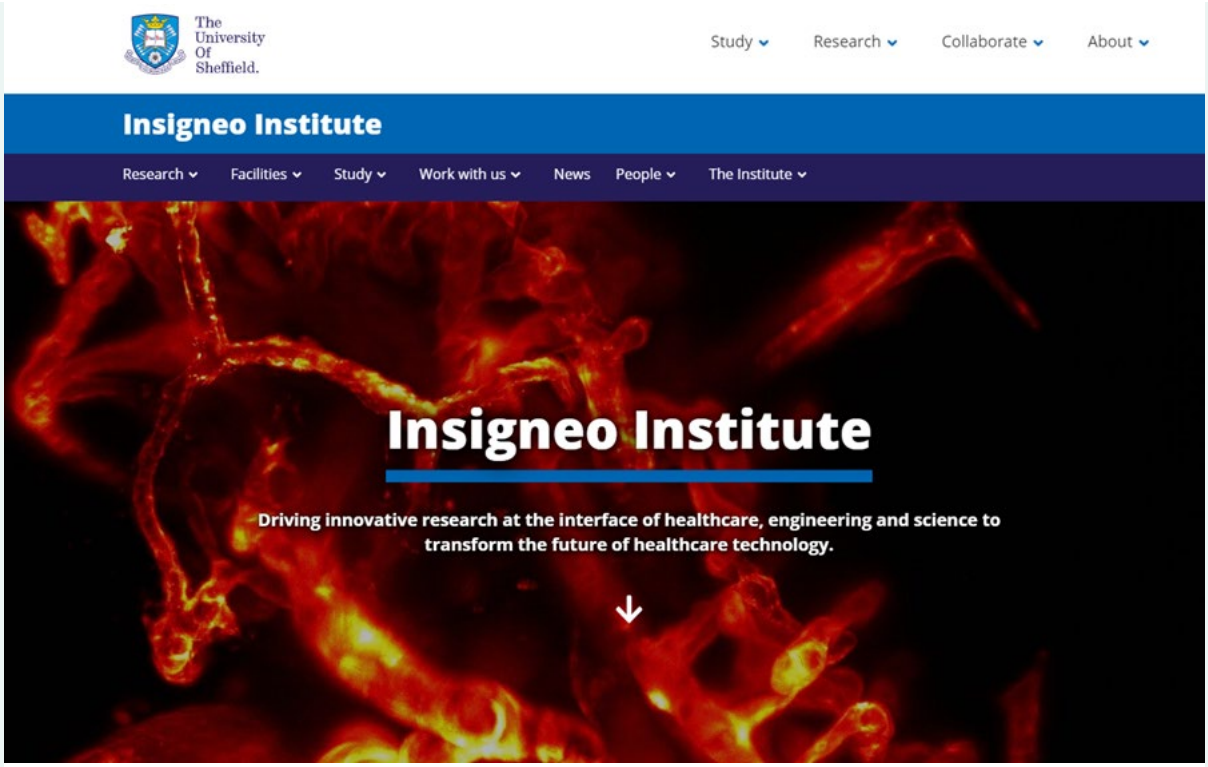
Welcome to our monthly Insigneo newsletter!

Our monthly e-newsletter keeps you up to date with events, funding, success stories and information. We hope you will find it useful! If you would like to add information and/or events to this newsletter please email: news@insigneo.org (the newsletter will be issued during the 2nd week of the month, excluding January and August). Please ensure that you submit news and events with a minimum of one week's notice.

Insigneo Winter Symposium

We would like to invite you to the Insigneo Winter Symposium to be held in Alfred Denny Conference room, Alfred Denny Building. More details to follow.

New website - coming soon!



The Insigneo website is moving to a new home on The University of Sheffield webpages! We are excited to announce that the move to the new website is planned for 24 November and members will be sent a link to preview the website this week.

If you have any questions please contact Sarah Hollely on news@insigneo.org

New members

We would like to introduce some of our new members who have joined the Insigneo Institute recently:

Dr Dana D. Damian
Department of Automatic Control and Systems Engineering

Lecturer

Dana Damian is heading the Sheffield Biomedical Robotics Laboratory. The mission of her group is to develop bionic and assistive robots that show life-like behavior and sustained operation in order to achieve long-term adaptive healthcare.

Dana D. Damian received her diploma in computer science and engineering from the Technical University Timisoara, Romania in 2007. In the same year she joined the Intelligent Systems Laboratory at University of Amsterdam, The Netherlands, to work on her diploma thesis with Prof. Nicu Sebe and Prof. Mihai Micea. At the end of 2007, she became a PhD candidate at the Artificial Intelligence Laboratory, University of Zurich, Zurich, Switzerland under the supervision of Prof. Rolf Pfeifer.

In 2011 she was a Visiting Scholar for one year at the Haptics Laboratory of the Johns Hopkins University, Baltimore, US and at the Collaborative Haptics in Robotics and Medicine, Stanford University, U.S.A. working with Prof. Allison Okamura. In 2012 she was a Visiting Scholar at the Soft Machines Laboratory at Carnegie Mellon University, U.S.A., working with Prof. Carmel Majidi. From 2013 to 2015, she was a postdoctoral research fellow at Boston Children's Hospital, Harvard University, Boston, USA, working with Prof. Pierre Dupont in the Pediatric Cardiac Bioengineering Laboratory. Since 2011, she is also a founder of the Private Library "Damian" in Romania.

Lab Webpage
Lab YouTube

Fiona Gibson
Department of Mechanical Engineering
PhD student

Hi, I'm Fiona and I've recently started my PhD with Dr Stefaan Verbruggen at the University of Sheffield in the Department of Mechanical Engineering.

Previously, I completed my undergraduate master's degree in mechanical engineering, specialising in biomechanics at the University of Sheffield. My current research titled ''Investigating Spinal Biomechanics in Multiple Myeloma patients for the Reduction of Surgical Intervention'' aims to develop a computational model of the biomechanics of a spine with multiple myeloma. Bracing has been used as an alternative to surgery to allow the bone to regrow, however, the biomechanics underlying supporting this approach remain uncertain, and recovery for individual patients is difficult to predict. Therefore, I hope to develop a computational tool, for clinicians, to predict the recovery using this bracing technique.

Nada Ghorab
Department of Infection, Immunity and Cardiovascular Disease
PhD student

Hello everyone! My name is Nada Ghorab and I have just started my PhD in Cardiovascular Disease in Dr Paul Morris' group at The University of Sheffield.

I have earned my Masters of Engineering degree in Bioengineering at The University of Sheffield in the summer of 2021, with a specialisation in cardiovascular computational fluid dynamics. I discovered my passion for this area of research after multiple industrial, technical and research internships, which included multi-disciplinary collaboration with experts in relevant fields.

My research is generally about integrating multiple imaging modalities, mainly

Optical Coherence Tomography (OCT) and X-ray Angiography, to better model diseased coronary arteries, and perform computational fluid dynamic simulations which would serve as a clinical decision support system for cardiologists, pre and post procedures.

Ning Wang
Department of Mechanical Engineering
PhD Student

My name is Ning, I have recently joined Dr Marzo's group as a Ph.D. student in Mechanical Engineering. In the meantime, I am also following my second supervisor Prof Sourbron to conduct magnetic resonance imaging (MRI) research.

I completed BEng (Hons) in University of the West of Scotland (UWS) in 2020, as well as I obtain the MSc in University College London (UCL) in 2021, both is Mechanical Engineering. During my five years as a student, I have accumulated a lot of scientific research experience, especially in computational fluid dynamics (CFD), hemodynamic and finite element analysis (FEA).

My current research aims to distinguish hypertensive and diabetic renal injury non-invasively using imaging biomarkers derived from a reduced-order vascular model and advanced MR imaging (iBEAt data). The value of this meaningful project is to distinguish the pathogenic factors (like hypertensive, diabetic and so on) of chronic kidney disease (CKD) in the early stage, to achieve the timely treatment of CKD, so as to improve the cure rate and reduce the treatment cost.

Ludmila Kucikova
Department of Neuroscience
PhD Student - AICN Group

Hi everyone, I am Ludka and I have just started my PhD within the Artificial Intelligence & Computational Neuroscience Group. The goal of the AICN group is to contribute to our understanding of psychiatric and neurological disorders by using advanced computational techniques and brain imaging.

My research focuses on mental deficits in Dementia with Lewy Bodies with the goal to build a computational model of visual hallucinations that would help us understand how they occur and to target potential therapeutic candidates in-silico.

Previously I completed an undergraduate Master's degree in Psychology (the University of Aberdeen), where I focused on investigating neural correlates of working memory by using EEG; and a Master's degree in Integrative Neuroscience (the University of Edinburgh), where I focused on investigating brain connectivity in patients with Alzheimer's disease by using resting-state fMRI.

Spinner EID - Final Event - Future Perspectives on Spine Surgery

Join our Spinner EID project for their Final Event - Future Perspectives on Spine Surgery on Tuesday 23 November 10:00-16:00 CET to hear the Spinner Fellows share their research results and the Spinner partners share their perspectives on the future of spine surgery.

Read more

Professor Iain Wilkinson's Memorial, Thursday 16th December

You are invited to attend the memorial of our friend and colleague Professor Iain Wilkinson. The University of Sheffield's Department of Infection, Immunity & Cardiovascular Disease are holding an informal afternoon of scientific talks and recollections from Iain's friends and colleagues celebrating Iain's work and his

collegiality.

Refreshments will be served at the end, which will include mulled wine and mince pies.

The memorial will take place on Thursday 16th December 2021 from 2.00pm-4.30pm in Lecture Theatre 2, B Floor, University of Sheffield Medical School, Royal Hallamshire Hospital.

If you would like to attend the memorial, please register via the link below.

If you have any queries, please don't hesitate to contact Jenny Rodgers at j.rodgers@sheffield.ac.uk.

Register

Academic projects for medical students

The Sheffield Academic Medicine Society (SAMS) would like to provide medical students (years 1-5) studying at Sheffield Medical School with more accessible opportunities to get involved in academia and clinical research, so that students can gain insight into research and network earlier in their medical careers. We are

compiling a database of projects and interested students who we will match up and hopefully provide a mutually beneficial experience for all involved.

We are looking for any type of medically-related project, be this in a laboratory, clinical, audit or trial setting etc. It could even be report-writing or help with data processing. The project can be in-person or virtual and duration is flexible. Please bear in mind that in terms of time required of the students, this will be an extra-curricular commitment for them - approximatley 1-5 hours a week.

If you have anything you think may be suitable please find below a link to a google form, where potential supervisors (**from the University of Sheffield or Sheffield Teaching Hospitals NHS Foundation Trust**) can fill in the details of their project. We will be in touch via email with any supervisors whose projects receive student applications, and the supervisor will be involved in the matching process at all times.

Link to form - https://forms.gle/SwqXpyikpVYdBb4V9

For more information please contact: Emily Beswick, SAMS Project Coordinator

Insigneo Seminar recording

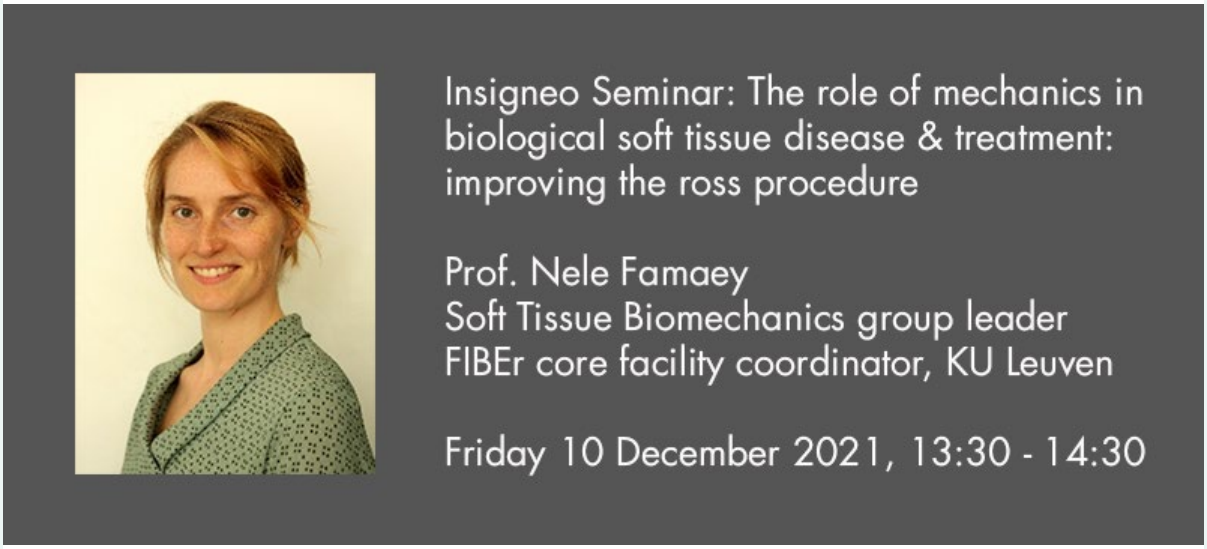
In case you missed it, we have a recording from our first hybrid seminar with an in-person speaker. Dr Caroline Roney, a lecturer in Computational Medicine and a Medical Research Council Skills Development Fellow in the School of Engineering and Materials Science, Queen Mary University of London gave a talk on ‘Predicting atrial fibrillation treatment outcomes through computational modelling, signal processing and machine learning’

Watch recording

Guest Lectures, Conferences & Seminars

Insigneo events

19 November 2021
Insigneo Seminar: Relaxin-2 for the treatment of Arthrofibrosis



10 December 2021
Insigneo Seminar: The role of mechanics in biological soft tissue disease & treatment: improving the ross procedure

14 December 2021
Insigneo Winter Symposium

28 January 2022
Insigneo Seminar: Jordi Alastruey-Arimon, King's College London

Other events

17 November
Synopsis webcast: 3D Printing the Future at Nicklaus Children's Hospital

18 November
N8 CIR Reprohack Hub Launch

18 November
Materialise Webinar on Mimics Segmentation

19 November
10:00 IICD Department Research in Progress Meeting: Alberto Biancardi 'CDeveloping Deep-Learning Segmentations for the Ventilation MRI Workflow', Daniel Taylor 'Computational simulation of coronary side-branch flow and physiological indices in patients presenting to the cardiac catheterisation laboratory' **Insigneo members contact sarah.black@sheffield.ac.uk to arrange access.**

22 November
Sano Seminar: Extreme-scale Data and Computing (Maciej Malawski, Sano Centre)

22 - 25 November
Klaster LifeScience Kraków (KLSK) Life Science Open Space 2021

26 November
10:00 IICD Department Research in Progress Meeting: Fahad Albalawi 'Role of autoimmune regulator (AIRE) in the pathogenesis of neurological disorders associated with autoimmune polyglandular syndrome type 1', Elliot Brooks 'Controlling macrophage subpopulation identity in Drosophila' **Insigneo members contact sarah.black@sheffield.ac.uk to arrange access.**

29 November
Sano Seminar: Clarisa Sánchez Gutiérrez, Informatics Institute, University of Amsterdam

1 December
ESB (European Society of Biomechanics) Webinar: How Simpleware software processes patient-specific anatomies in orthopedics

3 December
Fujifilm VisualSonics Cardiovascular user meeting - **please contact sarah.black@sheffield.ac.uk to arrange access.**

6 December
Sano Seminar: Clinical Data (Research Leader, Sano Centre)

13 December
Sano Seminar: Bartlomiej Sniezynski, Institute of Computer Science AGH, Krakow

20 December
Sano Seminar: Personal Health (Research Team Leader, Sano Centre)

For a full list of upcoming events visit: http://insigneo.org/events/

Publications

Research output affiliated to Insigneo in Scopus (please ensure papers are affiliated to the Insigneo Institute by including the words "Insigneo Institute for *in silico* Medicine"):

Global and local characterization explains the different mechanisms of failure of the human ribs (Journal of the Mechanical Behavior of Biomedical Materials) M. Palanca, C. Liebsch, S. Hübner, D. Marras, M. L. Ruspi, F. Marconi, L. Cristofolini, H.-J. Wilke

Walking on common ground: a cross-disciplinary scoping review on the clinical utility of digital mobility outcomes (npj Digital Medicine) A. Polhemus, L. D. Ortiz, G. Brittain, N. Chynkiamis, F.Salis, H. Gaßner, M. Gross, C. Kirk, R. Rossanigo, K. Taraldsen, D. Balta, S. Breuls, S. Buttery, G. Cardenas, C. Endress, J. Gugenhan, A. Keogh, . Kluge, S. Koch, M. E. Micó-Amigo, C. Nerz, C. Sieber, P. Williams, R. Bergquist, M. Bosch de Basea, E. Buckley, C. Hansen, A. S. Mikolaizak, La. Schwickert, K. Scott, S. Stallforth, J. van Uem, B. Vereijken, A. Cereatti, H. Demeyer, N. Hopkinson, W. Maetzler, T. Troosters, I.Vogiatzis, A. Yarnall, C. Becker, J. Garcia-Aymerich, L. Leocani, C. Mazzà, L. Rochester, B. Sharrack, A. Frei, M. Puhan, Mobilise-D

The importance of three dimensional coronary artery reconstruction accuracy when computing virtual fractional flow reserve from invasive angiography (Scientific Reports) R. Solanki, R. Gosling, V. Rammohan, G. Pederzani, P. Garg, J. Heppenstall, D. R.Hose, P. V. Lawford, A. J. Narracott, J. Fenner, J. P. Gunn, P. D. Morris

DenResCov-19: A deep transfer learning network for robust automatic classification of COVID-19, pneumonia, and tuberculosis from X-rays (Computerized Medical Imaging and Graphics) M. Mamalakis, A. J. Swift, B. Vorselaars, S. Raye, S. Weeks, W. Ding, R. H.Clayton, L. S. Mackenzie, A. Banerjee

Effect of the tool surface area and workpiece vibration on the μ edm performance (Surface Review and Letters) D. R. Unune

Time-Averaged Wavefront Analysis Demonstrates Preferential Pathways of Atrial Fibrillation, Predicting Pulmonary Vein Isolation Acute

Response (Frontiers in Physiology) C. H. Roney, N. Child, B. Porter, I. Sim, J. Whitaker, R. H. Clayton, J. I. Laughner, A. Shuros, P. Neuzil, S. E. Williams, R. S. Razavi, M. O'Neill, C. A. Rinaldi, P. Taggart, M. Wright, J. S. Gill, S. A. Niederer

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