INSIGNEO
Institute for *in silico* Medicine

The University Of Sheffield.

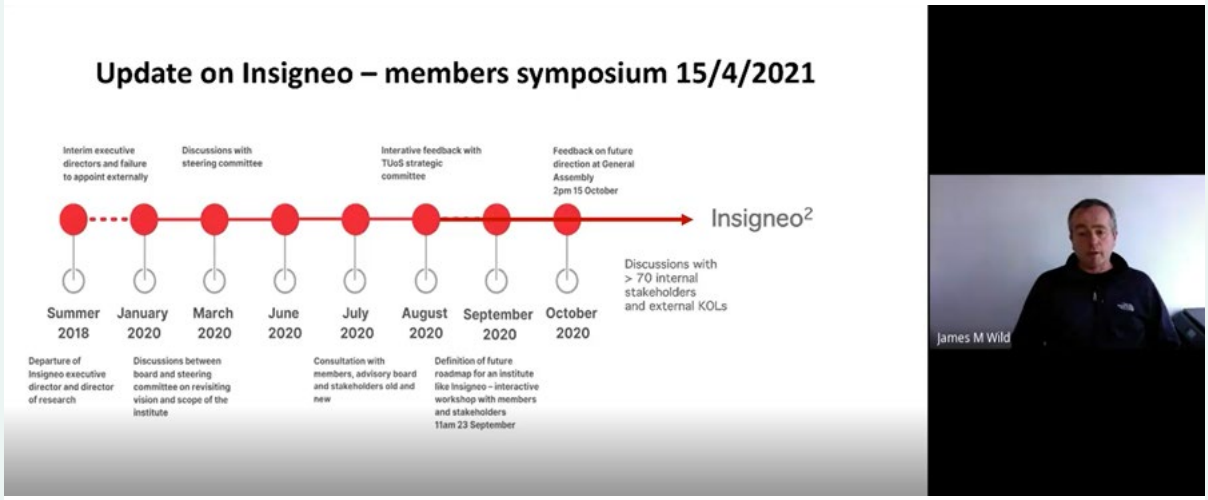
Sheffield Teaching Hospitals NHS
NHS Foundation Trust

Insigneo Newsletter - April 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 Spring Symposium



The Insigneo Spring symposium took place online on 15 April 2021. Professor Jim Wild, Insigneo's Interim Executive Director, opened the meeting with an update on the review which began last year with the aim of redefining and possibly expanding the institute’s vision, scope and strategy looking ahead at the challenges presented in modern healthcare.

Jim shared an overview of the feedback gathered through a questionnaire circulated to Insigneo members and through extensive conversations with members, internal and external stakeholders, and key opinion leaders. The feedback broadly fell into the following categories:

- Building new relationships and partnerships, and strengthening existing ones to take research/ideas/collaborations forward
- Working with industry to develop new products and take to market

Branding, communications and showcasing Insigneo
- Insigneo values
- Ideas for a future vision
- Potential areas of research to develop and strengthen

The next steps include:

- a broader set of research themes which will cut across all healthcare technology and biomedical research challenges that Insigneo is working on and deliver clinical translational impact.
- an expanded research directorate drawn from across faculties and the NHS trusts to lead and shape the proposed research themes

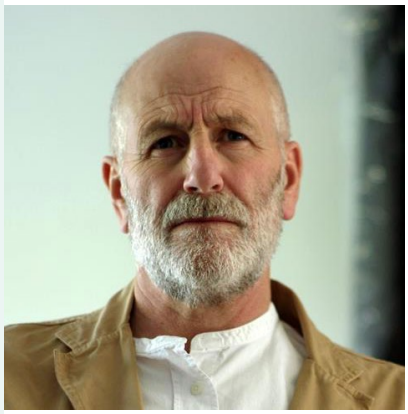
The future vision for Insigneo is still under development and Jim welcomed further conversations with members who are invited to contact him directly (j.m.wild@sheffield.ac.uk) with their thoughts on the proposals that were presented. There will also be a call for applications for leadership roles at all career levels from people with innovative ideas and enthusiam to shape the future direction of Insigneo's research.

During the second part of the meeting new members were invited to present on their research areas, we heard from:

- Chris Toseland - Toseland Lab - Cell Biophysics
- Su Li - AI & Computational Neuroscience
- Ivan Minev -Technologies for Soft Bioelectric Interfaces
- Ian Halliday - Chromo-dynamic Multi Component Lattice Bolzmann Equation Simulation for Complex Flow *A solution in search of a problem*

Welcome to new members

We would like to introduce some new members who have joined the Insigneo Institute recently. We are very pleased to welcome:



Professor Ian Halliday
Department of Infection, Immunity and Cardiovascular Disease
Professor of Computational Modelling in Cardiovascular Disease

Ian recently joined the University of Sheffield's Department of Infection, Immunity and Cardiovascular Disease.

He is a member of the Imaging research theme and will be working in the Mathematical Modelling in Medicine Group. His appointment builds on the important work of Rod Hose and Pat Lawford, who are now retired but remain very active as Emeritus Chairs.

Ian will be active in expanding the role of computational modelling in cardiovascular disease, aiming to develop a long-term strategy for basic and translational research in computational modelling, applied to diseases of the circulation.

Ian's recent research in in the area of fluid dynamics, specifically modelling the dynamics of complex fluids at a range of scales, from interfacial flows, through suspensions of deformable drops and vesicles (i.e. colloids and blood) to nematic liquid crystalline fluids, always aiming to understand the emergent macroscopic system behaviors.

He is also interested in hydrokinetics (applied kinetic theory) and a number of fundamental issues relating to lattice Boltzmann equation hydrodynamics (a niche CFD tool), especially chromodynamic multicomponent lattice Boltzmann simulation Here, his recent work has focused on high density contrast interfaces, numerical stability, the link to classical kinetic theory and -not least- utility.

Full profile

Dr Neil Stewart
Department of Infection, Immunity and Cardiovascular Disease
European Respiratory Society Marie Curie Research Fellow

Neil obtained a degree in physics from Durham University in 2012, and a PhD in

magnetic resonance imaging physics from the University of Sheffield in 2016. In 2017, he moved to Hokkaido University to undertake a post-doctoral research fellowship funded by the Japan Society for the Promotion of Science (JSPS). He is currently undertaking a European Respiratory Society (ERS) Marie Curie post-doctoral research fellowship in the POLARIS group at the University of Sheffield on lung MRI in infants in collaboration with the Center for Pulmonary Imaging Research (CPIR) at Cincinnati Children's Hospital.

Neil is currently looking for candidates for this PhD project: 'Rapid, Silent MRI for Cardiopulmonary Assessment in Newborns and Infants'

https://twitter.com/Stewart_NJ

Full profile

Dr Valentin Radu
Department of Computer Science
Lecturer in Pervasive/Ubiquitous Computing

Valentin joined the Department of Computer Science in August 2020. Before that he was a postdoctoral researcher at the University of Edinburgh, exploring deep learning optimisation for efficient inference on edge computing devices.

He received his PhD in 2017 from the University of Edinburgh, where he researched intelligent mobile systems for sensing applications. His research has been influenced by his visits at the University of Cambridge, in the Mobile Systems Group (2016), Intel R&D Ireland (2017) and Samsung (2015).

Full profile

Dr Ali Khurram
School of Clinical Dentistry
Senior Clinical Lecturer
Honorary Consultant Pathologist

Dr Ali Khurram is a Senior Clinical Lecturer and Consultant Pathologist at the University of Sheffield.

His postdoctoral training was funded by the National Institute for Health Research (NIHR), UK as a part of which he also trained as a Diagnostic Oral and Maxillofacial Pathologist. Following the successful completion of FRCPath in 2016, he was

appointed as a Senior Clinical Lecturer and Consultant Pathologist at the School of Clinical Dentistry, University of Sheffield.

He has a number of local, regional and national Clinical and Educational roles including:

- Clinical lead for the Sheffield Diagnostic Oral and Maxillofacial Pathology Service.
- Lead for undergraduate BDS Pathology Teaching
- Educational supervision of core and specialist oral pathology trainees
- Secretary and Webmaster- British Society for Oral and Maxillofacial Pathology (BSOMP).
- Digital Advisor and Webmaster- Pathological Society of Great Britain & Ireland
- Member of the Educational Committee- European Society of Integrated and Digital Pathology

He has previously held the roles of Audit Lead for the hospital as well as Molecular Pathology Lead for South Yorkshire and Bassetlaw Network. He is actively involved in research and leads his own research group called NEOPATH with a particular interest in undertaking clinically relevant research to benefit head & neck cancer patients, salivary gland pathobiology and role of the tumour microenvironment in cancer metastasis and bone invasion. Over the last few years, he has been actively involved in investigating the use of Machine Learning and Artificial Intelligence, exploring their role in pathological diagnosis and prediction of prognosis prediction. You can find out more about him using the links below:

https://twitter.com/sakhurram
https://www.neopath.org.uk

Full profile

Neda Azarmehr
School of Clinical DentistrySchool of Clinical Dentistry
Postdoctoral Research Fellow- funded by CR UK

Neda is working as a Research Fellow as part of the NEOPATH Research Group.

She is currently working on developing AI models for early oral cancer detection on the multidisciplinary collaborative CR UK funded ANTICIPATE study with Dr Ali Khurram and Professor Nasir Rajpoot (University of Warwick).

Neda was awarded a PhD scholarship (2017-2021) at the University of Lincoln

(school of computer science), in collaboration with Imperial College London to develop automated models using deep learning, computer vision algorithm, and medical image analysis to assess the left ventricle function which enables physicians to analyse cardiac echo images more precisely. Neda has an undergraduate degree in Health Information Technology, and a MSc in Big Data Analytics. She has a strong interest in application of Artificial Intelligence to medical applications. Before joining The University of Sheffield, Neda worked as an associate lecturer in the field of Computer Science at multiple UK higher education institutions. Neda's research interests are mainly centred on algorithm development, computer vision, machine learning, deep learning, and medical image analysis. She has published research articles in national and international journals and conferences. Neda is a reviewer for several peer-reviewed international journals.

Full profile

University of Sheffield researchers collaborate on a European research project to raise awareness of the impact of hypoglycaemia on people's lives

Researchers from the University of Sheffield's School of Health and Related Research (ScHARR) and Department of Oncology and Metabolism are collaborating with other partners as part of a European research project to provide further evidence about the condition of hypoglycaemia.

Hypoglycaemia is a common and potentially serious side effect of insulin treatment in diabetes, and their aim is to alleviate the burden and consequences for people living with diabetes and healthcare systems in general as part of the Hypo-RESOLVE project.

Read more

Two 12-month internship positions at GE Healthcare

Two positions are available on a 12-month contract basis to work on digital and imaging technology teams in the R&D department of GE Healthcare Pharmaceutical Diagnostics (PDx). The PDx business researches, manufactures and markets innovative imaging agents and digital adjacencies. Imaging agents are used during

medical scanning procedures to better visualise organs, tissue and biological processes of the human body, and to aid physicians in the early detection, diagnosis and management decisions for patient care.

The successful candidates will particularly get exposure to diagnostics in areas such as neurology, cardiology and oncology, across a range of imaging modalities such as CT, MRI, ultrasound, SPECT, and PET.

Read more

Grant writing club - 30 April 2021

Insigneo members are invited to join the Department of Infection, Immunity & Cardiovacular Disease's weekly Department Research in Progress Meetings (DRIP) and are now also invited to join the Imaging and Cardiovascular research themes **Grant Writing Club** which has been scheduled for 11:00 immediately following the 30 April DRIP meeting (please contact sarah.black@sheffield.ac.uk to arrange access to DRIP meetings).

This meeting is designed to provide PDRAs, fellows and academics with feedback on their funding applications at an early stage. This is how it works:

- grant writers submit a 1-2 page summary of their grant (or fellowship) with specific aims,
- this is circulated to other PIs/Fellows in our theme before the meeting.
- We then ask those attending the meeting to provide feedback at the meeting.

If you have an idea you would like us to consider at the meeting, please send Professor Paul Evans (paul.evans@sheffield.ac.uk) a 1-2 page summary of your proposal including your aims, the funding scheme, and approximate funding/costs.

Guest Lectures, Conferences & Seminars

Insigneo events

Insigneo Seminar: A multi-scale modelling approach to gastrointestinal electrophysiology and motility

Dr Peng Du
The University of Auckland
Friday 11 June 2021, 09:00 - 10:00

11 June
Insigneo Seminar: A multi-scale modelling approach to gastrointestinal electrophysiology and motility

Other events

30 April
10:00 IICD Department Research in Progress Meeting & Grant Writing Club
Speakers: 'Zebrafish endothelial proliferation: relevance to atherosclerosis' - George Bowley (Evans group), ‘Stop COVID, stop PAH?' - Roger Thompson. Insigneo members contact sarah.black@sheffield.ac.uk to arrange access.

4 May
IBM Bede Training: CryoEM, Genomics, and other Life Sciences workloads on Bede

6 May - 25 June
3D Experience MODSIM 4 Part Series

7 May
10:00 IICD Department Research in Progress Meeting
Speakers: **Insigneo members Eve Lennie & Ian Halliday**
Insigneo members contact sarah.black@sheffield.ac.uk to arrange access.

13 May
nTopology, Ansys EOS, NSI, Synopsys A Journey Through Advanced Manufacturing in 2021: Part 3(/6) Simulation of the build and the actual build process (Ansys, EOS)

14 May
10:00 IICD Department Research in Progress Meeting
Speakers: '31P NMR Spectroscopic Evidence for Phosphohistidine in Proteins from a Mammalian Cell' - Mehul Makwana/Richmond Muimo, 'SARS-CoV-2 T-cell

responses following infection and vaccination' - Adri Angyal
Insigneo members contact sarah.black@sheffield.ac.uk to arrange access.

15 - 20 May
ISMRM & SMRT Annual Meeting & Exhibition

18 May
Ansys In Silico Design and Approval for Cardiovascular Devices

21 May
10:00 IICD Department Research in Progress Meeting
Speakers: Tom Darton & Arturo Landeros de la Isla
Insigneo members contact sarah.black@sheffield.ac.uk to arrange access.

27 May
nTopology, Ansys EOS, NSI, Synopsys A Journey Through Advanced Manufacturing in 2021: Part 4(/6) CT Scanning of the part and image-based inspection (NSI, Synopsys)

7 -11 June
5th VPH Barcelona Summer School: Tackling Complexity in Health & Medicine

10 June
nTopology, Ansys EOS, NSI, Synopsys A Journey Through Advanced Manufacturing in 2021: Part 5(/6) FE meshing of the part, FE simulation and validation testing (Synopsys, Ansys)

23 June
Synopsys Simpleware Customer Webinar Computer Models in Wound Care Research: The Key to Innovation

24th June
nTopology, Ansys EOS, NSI, Synopsys A Journey Through Advanced Manufacturing in 2021: Part 6(/6) Expert Panel discussion of the entire workflow and implications on mass-production

11 -14 July
ESBiomech Conference 2021, Milan

25 - 29 July
ISB2021, Stockholm

6 - 7 September
BioMedEng21, Sheffield

6 - 10 September
Bone Cell & Tissue Mechanics Advanced Courses, CISM (International Centre for

Mechanical Sciences)

7 - 9 September
CMBBE 2021 Symposium 17th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering and the 5th Conference on Imaging and Visualization

15 September
CompBioMed Conference 2021: Building the Virtual Human

22 - 27 November
Klaster LifeScience Kraków (KLSK) Life Science Open Space 2021

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

Vacancies

Two 12-month internship positions at GE Healthcare
(Closing Date: 30/04/21)

PhD Opportunity: Computational Fluid Dynamics Modelling of Blood Flow in Patients with Coronary Artery Disease
(Closing Date 14/05/21)

PhD Opportunity: Rapid, Silent MRI for Cardiopulmonary Assessment in Newborns and Infants
(Closing Date: 19/05/21)

PhD Opportunity: Biomedical Engineering PhD Studentship – Investigating Spinal Biomechanics in Multiple Myeloma patients for the Reduction of Surgical Intervention
(Closing Date: 31/05/21)

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"):

Finite element analysis informed variable selection for femoral fracture risk prediction (Journal of the Mechanical Behavior of Biomedical Materials) M. Taylor, M. Viceconti, P. Bhattacharya, X. Li

Nocturnal Hypoglycemia in Patients With Diabetes Discharged From ICUs: A Prospective Two-Center Cohort Study (Critical care medicine) Y. Ali Abdelhamid, A. Bernjak, L. K. Phillips, M. J. Summers, L. M. Weinel, K. Lange, E. Chow, P. Kar, M. I. Horowitz, S.Heller, A. M. Deane

Regulation of nuclear mechanics and the impact on dna damage (International Journal of Molecular Sciences) Á. dos Santos, C. P. Toseland

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