

## Insigneo Newsletter - November 2020

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](mailto: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.

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### Call for ESPRC DTP studentship

**INSIGNEO**  
Institute for *in silico* Medicine

**ESPRC DTP Studentship**

We are pleased to announce that the Insigneo Institute has been allocated a studentship from the University of Sheffield's EPSRC DTP strategic allocation. The studentship will start in October 2021 at the latest.

Insigneo would like to invite interested members to apply, we are keen to expand Insigneo horizons and would particularly welcome applications from new and exciting projects working at the interface of engineering, medicine, physics and biology. We would also like to encourage applications with early career academics as the primary supervisor.

#### **The Studentship:**

The studentship is for three and a half years with home fee, stipend and £4,500

RTSG. There is the option to convert it to a full CASE Studentship (i.e. with a company providing a third again of the funding), for four years and the University would provide the four years from the DTP.

The usual EPSRC eligibility requirements apply and the University scholarship team will carry out eligibility checks.

Please note: The student needs to start in October 2021 in order to finish within the grant period, however they could start sooner than that if needs be.

**Please send applications to Sarah Black on [sarah.black@sheffield.ac.uk](mailto:sarah.black@sheffield.ac.uk) by 15th January 2020.**

[Find out more & apply](#)

## Insigneo Winter Symposium



All Insigneo members are invited to our online Winter Symposium which will take place on 8 December from 11:00 - 12:00 (please check your calendar invitation for the link to join).

We would like to encourage our members to share their work so if you would like to give a powerpitch at this event please let us know by contacting Sarah Black on [sarah.black@sheffield.ac.uk](mailto:sarah.black@sheffield.ac.uk) **by 25 November 2020.**

Please feel free to bring along a coffee and your favourite festive treats and join us for some social activities at the end of the meeting.

## In memory of Iain Wilkinson



It is with profound sadness that we inform you that Professor Iain Wilkinson, Emeritus Professor in the Department of Infection, Immunity and Cardiovascular Disease, University of Sheffield sadly passed away on Tuesday 27 October 2020 after a long illness.

Iain was Head of Adult Neuroimaging in the MRI unit in the Medical School and the Advanced Imaging Lead for the Sheffield NIHR Biomedical Research Centre and a long-standing member of Insigneo. Iain had worked at the University of Sheffield from 1997 until his retirement earlier this year.

Iain's funeral was held at St Helens Church in Grindleford at 2pm on 11 November 2020. Due to Covid-19 restrictions attendance was limited to invitation only. Donations can be made to the [childhood eye cancer trust](#).

Iain's son, Luke Wilkinson, said, "Having faced adversity from birth, my dad, Iain, acted on this and used it to drive him towards becoming a specialist in his field. This determination was something I was oblivious to for much of my life, however now I realise this was a perfect sum of his character. He allowed his health problems/disabilities to guide him towards academic and medical progress rather than disabling him from other aspects of life. It's this cup half full perspective, backed up by innate intelligence and consistent hard work, that made Iain the successful man from a Cornish campsite that he was."

Professor Jim Wild, Interim Executive Director of Insigneo said, "Iain was a friend and colleague who will be missed by all his friends and former colleagues in Sheffield, London, Cambridge and across the world in the field of neuro-MRI and diabetes imaging research. Iain was well loved and respected in the British and International MRI research communities. The British Chapter of ISMRM were really happy to have Iain give the celebratory toast at the 25th Anniversary meeting in Sheffield last September amongst old friends. A more detailed account of Iain's work and personal recollections from friends and former colleagues will follow in due

course and at some point when we are able we will hold a celebration of Iain's work in Sheffield."

## Innovate UK Innovation Scholar Secondment for Dr Jan Wolber



Dr Jan Wolber from GE Healthcare will join the University of Sheffield in January 2021 with a three year Innovate UK Innovation Scholar Secondment.

Jan has worked with the University of Sheffield and Insigneo's Interim Executive Director, Professor Jim Wild, previously through their collaboration with General Electric and has a background in hyperpolarised MRI and PET imaging, commercialisation of innovations, and a strong interest in the area of image analysis technology, AI and digital patient-focused analytics solutions. He has held an honorary professorship in Jim Wild's group since 2012.

The theme of Jan's secondment will be to build an innovation partnership between the University of Sheffield and GE Healthcare to scale up digital health innovations.

[Read more](#)

## NIHR NHSX grant to develop AI tools to measure heart health using MRI/CT scans



Congratulations to Insigneo members Dr Andy Swift, Dr Haiping Lu and colleagues who have been awarded a £836,551.00 NIHR NHSX grant through the AI in Health and Care Award. The project is a collaboration with Dr Rob Van Der Geest Leiden University Medical Centre, and Dr Declan O'Regan at Imperial College. The aim is to develop AI tools to measure heart health using MRI/CT scans. One of the 42 of >500 successful applications.

Heart and lung diseases together account for close to half of all deaths in the UK, 26% and 20%, respectively. Picturing the working of the patient's heart is vital to good diagnosis and treatment. Cardiac magnetic resonance imaging (CMRI) and computed tomography (CT) scans are key to diagnosis. Currently doctors draw on the images of the heart to clarify their view of its function. This information we describe as 'physiological parameters', unfortunately this procedure is time-consuming and two sets of drawings may give different results.

The application of computer AI (artificial intelligence) to image analysis is a fast developing field of research. Recently, an AI program trained on large numbers of scans with different types of heart disease has been shown to make accurate drawings on the scan images automatically for the left ventricle. This project uses both human and machine intelligence, in a process called 'human in the loop' to create an AI tool to measure the health of the heart in large cohorts of patients with different cardiac and pulmonary conditions. This method should generate improved 'physiological parameters' for the four chambers of the heart.

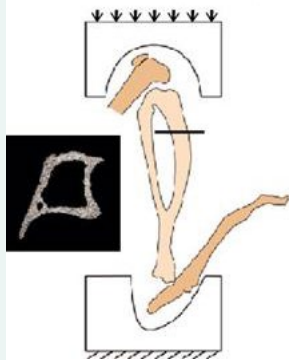
The AI assessment of the heart will provide important measurements for predicting how well treatments are working and patient survival in individuals with cardiac disease. The automatic 'physiological parameters' produced by this deep learning (human plus AI) approach could revolutionise disease assessment and improve treatment delivery and patient care. Key advantages are rapid assessment, minimised human error and a more consistent and comprehensive assessment of

the heart.

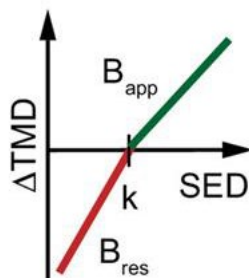
AI tools and products are the first projects to be funded by the NIHR's [AI in Health and Care Award](#) and will receive a share of funding totalling over £50 million. The funding forms part of the [NHS Artificial Intelligence Lab](#) and the award is managed by the [Accelerated Access Collaborative](#) in partnership with [NHSX](#) and NIHR.

## Bone remodelling in the mouse tibia is spatio-temporally modulated by oestrogen deficiency and external mechanical loading: A combined *in vivo/in silico* study

### **In vivo loading & imaging**

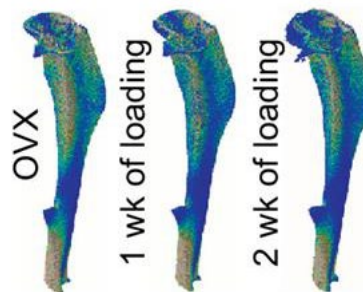


### **Bone changes simulation**



### **4D analyses**

#### **Strain distribution**



#### **Locations of remodelling**



Researchers from our MultiSim project have published a paper in the journal *Acta Biomaterialia* on 'Bone remodelling in the mouse tibia is spatio-temporally modulated by oestrogen deficiency and external mechanical loading: a combined *in vivo/in silico* study'.

[Read more](#)

# Congratulations!

NIHR Clinical Lectureship in Cardiology for Dr

## Rebecca Gosling

Congratulations also to Dr Rebecca Gosling on her new role as a NIHR Clinical Lecturer in Cardiology.

The post is funded by the NIHR and will allow Rebecca to spend 50% of her time doing research within the university and the other 50% working clinically at the hospital. She will use her academic time to develop a model of global myocardial ischaemia to further personalise treatment decisions in patients with coronary artery disease.

We look forward to welcoming Rebecca back in March 2021, on her return from maternity leave, and would like to take this opportunity to thank her for her time served on the Insigneo Board as Interim Director of Clinical Translation during 2018-2019 while Dr Paul Morris was away from Sheffield working at the Royal Jubilee Hospital in British Columbia, Canada doing a British Cardiovascular Intervention Society and Boston Scientific fellowship in coronary intervention.

## Dr Paul Richmond appointed President of the Society of Research Software Engineering

Congratulations to Insigneo member Dr Paul Richmond, Senior Lecturer in the Department of Computer Science and Director of the Sheffield RSE Group, who has recently been appointed as President of the Society of Research Software Engineering.

The society's mission is to establish a research environment that recognises the vital role of software in research. They work to increase software skills across everyone in research, to promote collaboration between researchers and software experts, and to support the creation of an academic career path for Research Software Engineers.

[Read more](#)

## Bede – N8 CIR supercomputer



N8 CIR's Bede is a novel architecture supercomputer based upon IBM Power 9 CPU and NVIDIA Volta GPUs. This architecture supports memory coherence between the GPU and CPU and a hierarchy of interconnects to allow effective distributed GPU use. This architecture will extend the size of problems that can be tackled beyond that of other GPU-accelerated architectures; increasing data sizes

for accelerated simulation and analysis codes, and reducing the 'time to science' for a range of 'hard' problems.

We encourage our members to take the opportunity to find out more and engage with this resource.

[Read more](#)

## Sano becomes the partner of Life Science Open Space Online Week 2020



Our Sano project is inviting participants to the Digital Health (Computational Medicine) session organized as part of the Life Science Open Space Online Week by Cluster LifeScience Krakow. Sano, as the event's partner, is also the leader of the Digital Health session chaired by Marian Bubak. Dr Andrew Narracott, Insigneo's Director of Operations and the University of Sheffield's Principal Investigator for the Sano project will be speaking during the Digital Health session.

[Read more](#)

## Call for participation for the VPHi student committee





**Join  
the VPHi  
student  
committee**

A call for participation for  
the VPHi student committee  
is now open!

Application  
deadline **30 Nov 2020**



A call for participation for the VPHi student committee is now open! They are looking for motivated PhD students with interest in *in silico* medicine research willing to invest some energy and enthusiasm! **Application deadline 30 Nov 2020.**

[Read more](#)

## Guest Lectures, Conferences & Seminars

### Insigneo Events

8 December 2020

[Insigneo Winter Symposium](#)

22 January 2021

[Insigneo Seminar - Aurelié Carlier \(University of Maastricht\)](#)

19 February 2021

[Insigneo Seminar - Base-pair resolution analysis of the effect of supercoiling on DNA structure and flexibility](#)

### Other Events

23 November 2020

[Sano Seminar: Vivek Sheraton Muniraj – Amsterdam Medical Centre and Institute For Advanced Study \(IAS\), Amsterdam, The Netherlands](#)

30 November 2020

[Sano Seminar: Thomas Reiss – Fraunhofer Institute for Systems and Innovation Research IISI Karlsruhe, Germany](#)

7 December 2020

Sano Seminar: Dieter Kranzlmüller – Institut Für Informatik Der LMU, Muenchen, Germany and Leibniz Rechenzentrum (LRZ), Garching, Germany

9 December 2020

RSE LunchBytes #3: Accelerated Machine Learning

14 December 2020

Sano Seminar: Irena Roterman-Konieczna – Communication in living organism

13 January 2021

RSE LunchBytes #4: Data Visualisation

6 - 7 September 2021

BioMedEng21 - Save the date!

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

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## Publications

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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"):

**Bone remodelling in the mouse tibia is spatio-temporally modulated by oestrogen deficiency and external mechanical loading: A combined *in vivo/in silico* study** (Acta Biomaterialia) V. S. Cheong, B. C. Roberts, V. Kadiramanathan, E. Dall'Ara

**Toward a Regulatory Qualification of Real-World Mobility Performance Biomarkers in Parkinson's Patients Using Digital Mobility Outcomes** M. Viceconti, S. H. Penna, W. Dartee, C. Mazzà, B. Caulfield, C. Becker, W. Maetzler, J. Garcia-Aymerich, G. Davico, L. Rochester

**Full-field comparisons between strains predicted by QCT-derived finite element models of the scapula and experimental strains measured by digital volume correlation** (Journal of Biomechanics) J. Kusinsa, N. Knowles, M. Ryan, E. Dall'Ara, L. Ferreira

**Cardiac-MRI Predicts Clinical Worsening and Mortality in Pulmonary Arterial Hypertension: A Systematic Review and Meta-Analysis** (JACC: Cardiovascular Imaging) S. Alabed, Y. Shahin, P. Garg, F. Alandejani, C. S. Johns, R. A. Lewis, R. Condliffe, J. M. Wild, D. G. Kiely, A. J. Swift

**Body Anthropometry and Bone Strength Conjointly Determine the Risk of Hip Fracture in a Sideways Fall** (Annals of Biomedical Engineering) M. Palanca, E.

Perilli, S. Martelli

**Cardiac Magnetic Resonance in Pulmonary Hypertension—an Update** (Current Cardiovascular Imaging Reports) S. Alabed, P. Garg, C. S. Johns, F. Alandejani, Y. Shahin, K. Dwivedi, H. Zafar, J. M. Wild, D. G. Kiely, A. J. Swift

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