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The Computational Health Informatics Lab at OSCAR

The Computational Health Informatics (CHI) lab led by Professor David Clifton focuses on "AI in healthcare", also known as Clinical AI, and exists at the interface between machine learning and health informatics. The group has access to some of the world's largest curated, anonymised healthcare datasets. CHI Lab creates Al-based interventions for healthcare systems and includes work with wearables and hospital data, across scales from the massively multivariate (including anonymised genomics) to the high-rate data acquired from medical devices.



Members of the lab share a common interest in deep learning, Bayesian inference, and related methods. Systems developed as a result of their work are routinely used in the care of patients within the UK National Health Service, and for improving access to healthcare in the developing world. Clinical collaboration is at the heart of each of our projects, with biomedical engineers working alongside clinical colleagues, which ensures that each project feeds directly into the care of patients. The goal of CHI at OSCAR is to collaborate with local Chinese clinical partners to introduce this technology into Chinese healthcare.

PIS



David Clifton

- Professor of Clinical Machine Learning, Department of Engineering Science, University of Oxford
- Research Fellow of the Royal Academy of Engineering
- Visiting Chair in AI for Healthcare at the University of Manchester
- Fellow of Fudan University, China
- Al Research Director of Sensyne Health, a "Clinical Al" company
- Joint winner of the 2018 inaugural "Vice-Chancellor's Innovation Prize"
- Winner of the 2016 Grand Challenge award from the UK Engineering and Physical Sciences Research Council

Group members



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Translational Research

The CHI lab is heavily involved in translational research, bringing their academic results to market or to the hospital. Outcomes are often patented and commercialised, often via start-up companies formed around the Lab's research. Since 2008, it has commercialised large-scale projects of jet engine health monitoring systems (used by the Airbus A380 and Boeing 787 Dreamliner), the world's first FDA-approved patient monitor (Visensia), and the SEND system, which is used to monitor 70,000 patients each month in the NHS.

Key Research Areas

Al for Hospital-Wide Early Warning

Modern hospitals now collect many data electronically, including patient descriptors (for example age and previous admissions), laboratory results, and vital signs. CHI Lab has developed hospital-wide early warning systems based on "big data"; AI that performs risk assessment in all hospital patients continuously to assist clinicians to identify at-risk patients quickly and initiate treatment.

Al for Wearables Mobile Health

There is an urgent need for mobile ("m-health") systems for patients both within hospitals and the home environment, comprising unobtrusive patient-worn sensors and lightweight processing that are sufficiently robust for use in clinical practice. CHI Lab members are developing (i) estimating vital signs from sensors in a robust manner; (ii) performing intelligent processing of the resulting data to stratify patients according to risk; and (iii) working on forecasting methods for predicting serious physiological events using wearables.

Al for Cardiovascular Disease

CHI Lab collaborates with the China Kadoorie Biobank, which has been set up to investigate the main genetic and environmental causes of common chronic diseases in the Chinese population. Better understanding the risks of chronic disease in the Chinese people will help advise patients concerning how to improve their lifestyle, will help the discovery of appropriate treatments for these conditions, and will drive down costs in the Chinese healthcare system.

Al for Infectious Disease

Whole-genome analysis (of pathogen DNA) combined with machine learning across the electronic patient record can be performed near same-day, greatly improving our ability to identify and fight outbreaks of infectious disease. CHI Lab collaborates with the global CRyPTIC consortium that brings world-leading clinicians, biomedical scientists, and data scientists to address the pressing clinical need for better understanding of infectious disease.



PI Activities

On 18 October, OSCAR PI Donal Bradley (VP for Research at KAUST) and KAUST President Tony Chan visited OSCAR and met researchers to explore potential collaborations.



King Abdullah University of Science & Technology (KAUST) was established in 2009 as a graduate-level research university located in Saudi Arabia. https://www.kaust.edu.sa/en



Meeting with Chairman of Suzhou Industrial Park Administrative Committee Mr. Ding Lixin (R2)

PI Activities

On 22 October, PI Prof. Zhanfeng Cui attended China-Australia High-End Forum on Research Innovation and Commercialisation as a special guest. He chaired one plenary session and gave a speech about OSCAR. The Forum was organized by South East University of China & Monash University of Australia.



In October, PIs Prof. Zhanfeng Cui and Prof. Cathy Ye were at OSCAR to meet collaborators and to assess research progress.

On 23 October, a delegation from Shangqiu Municipal Government led by the Mayor Mr. Jianhui Zhang visited OSCAR. Prof. Zhanfeng Cui, Director of OSCAR, had a meeting with them and discussed the potential collaborations between OSCAR and Shangqiu City. PI Prof. Cathy Ye's group signed an MOU to collaborate with Shangqiu City on technology development for local industry.



OSCAR attended the ICON-2DMAT 2019, an international conference on two-dimensional materials.





Meet OSCAR Researchers Exclusive Interview of Dr. M. Kamran Khan



Dr. M. Kamran Khan did his Master's in chemistry at the Kohat University of Science & Technology, Pakistan. He obtained his doctorate in Biochemical Engineering from the Institute of Process Engineering, University of Chinese Academy of Sciences, Beijing, China. Dr. Khan worked as a postdoctoral researcher at the Department of Chemical Engineering, Tsinghua University, Beijing, China.

Q: When did you join OSCAR? What promoted you to make the decision to join OSCAR here in Suzhou?

I joined OSCAR in September 2019 as a research scientist in the Surface Functionalization Chemistry group, led by Prof. Mark Moloney. After my Doctorate, I had two dreams: to live in a peaceful place and to work at a prestigious institute. Working with the University of Oxford and living in the city of Heaven, Suzhou, OSCAR completed my dreams.

Q: What is your research project and how is it progressing? Have you participated in any academic conferences?

I work on developing functional materials using novel polymerization processes for engineering and biomedical applications. We are also working on blending polymers with graphene for possible applications in biosensors and wastewater treatment. Because of the well-equipped labs at OSCAR, I started my research very soon after joining, and most probably we will publish our first data in the next eight months.

We are starting a collaboration with Department of Chemistry, Xi'an Jiaotong-Liverpool University and others from China, UK, US and Canada are contacting us for possible collaboration.

OSCAR links me to world-renowned scientists via conferences and meetings. Over just a couple of months, I have participated in three conferences "InnoFest Suzhou", "China-Australia High-End Forum" and "CHInano Suzhou".



Q: What is your short-term and long-term research plan and aims at OSCAR?

For the time being I want to fabricate advanced functional materials using very common raw materials like rubber, cellulose and plastic, via our advanced functionalization techniques. Looking further into the future, my goal at OSCAR is to apply our functional materials for solving real-world problems like water purification, CO₂ capture, and antibacterial bioproducts at industrial scale. Suzhou Industrial Park is an ideal place to fulfill my future goals via applying our lab research at industrial level.

Q: How is your life at OSCAR and in Suzhou?

OSCAR is a great place for a young scientist like me, as one can work independently while still benefiting from the great ideas of professors at Oxford. As we have Physical, Biological and Mathematical groups in OSCAR, it's a great opportunity to solve great scientific problems in an easy way via collaboration. The OSCAR admin team is fantastic; they have helped me in every possible way regarding my research as well as personal life.

As the famous saying goes, "at heaven there is paradise and on earth there is Suzhou", the life at Suzhou is fabulous. One can skip from the busy week to enjoy a weekend at the banks of a vast number of lakes, big parks or you can go shopping at the well-developed city center.

Q: Any others you would like to share?

I have been in China for 6 years; I have a Chinese wife and a Chinese son too. I have visited many places in China, but I found Suzhou one the most beautiful place to live. Working at OSCAR is a great opportunity to do science with great scientists from the University of Oxford and apply it in the great industries of China.



Open to Collaborations

On 8 October, Prof. Xinqiang Wang from the School of Physics of Peking University visited the OSCAR Optoelectronic Technology Laboratory. Prof. Wang is a Changliang Distinguished Professor, specializing in wide gap semiconductor materials and their applications in solar cell, single photo source, resonant tunneling diodes, dual bands detectors, light source and so on. Dr. Jingsong Huang met him and discussed potential collaboration in the thin film semiconducting perovskite materials.

On 10 October, OSCAR researchers and admin visited KIT China Branch in SIP to exchange ideas. Karlsruhe Institute of Technology (KIT) from Germany set up its China Branch in SIP in 2014 with aims to deliver research, industry/innovation, and training. The Industrial 4.0 innovation centre (IC) and Artificial Intelligence Innovation Factory (AIIF) have been successfully established. OSCAR visited its IC and AIIF to explore possible collaborations.



On 13 October, the Mayor of Dalian City, Mr. Tan Chengxu, led a delegation to OSCAR to learn about the collaboration model between Oxford and SIP.





OXFORD SUZHOU CENTRE FOR ADVANCED RESEARCH

On 22 October, Consul of Science & Innovation of British Consulate-General Shanghai, Mr. Stephen Brennan, visited OSCAR to meet with OSCAR Director Prof. Cui and researchers to explore collaboration possibilities. Prof. Cui had a meeting with him and outlined current progress and plans of OSCAR.





On 23 October, Associate Vice President (Research Relationships China) University of Technology Sydney, Zhang Chengqi, visited OSCAR to discuss collaboration possibilities.



On 23 October, Zhang Pijun, Director of R&D Center of Baosteel and senior engineer, visited OSCAR to explore cooperation opportunities. He is experienced in the silicon steel industry.



On 23 October, a delegation of the Anhui Provincial Government led by Prof. Haihe Jiang, Hefei Institute of Physical Science, CAS, visited OSCAR. They learned about the operation arrangements of OSCAR.

On 24 October, the Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences (SIBET) visited OSCAR. The delegation led by Director Tang Yuguo also visited Oxford earlier this month.

On 24 October, the Suzhou Municipal Science and Technology Bureau Director Zhang Dongchi (L3) visited OSCAR to learn about OSCAR progress in research and recruitment.



SIP News in Oct

China-Australia High-end Forum on Research Innovation and Commercialization Held in SIP



The three-day China-Australia High-end Forum on Research Innovation and Commercialization kicked off in SIP on 22 October. A host of Chinese and Australian government officials, experts and scholars were present to share their opinions on research and research finding commercialization in such fields as science and technology innovation, energy resource utilization, environmental protection, new drug discovery and healthcare.

The event, sponsored by Southeast University, a public research university in Nanjing (capital of East China's Jiangsu province), and Monash University, one of Australia's leading universities, facilitated cooperation between Chinese and Australian parties in innovative research projects and commercialization of research outcomes.

Wu Qingwen, member of the Standing Committee of CPC Suzhou Committee and secretary of SIP Party Working Committee, spoke at the event, hoping that more and more domestic and overseas higher education institutions and research institutes will bring their projects to SIP.

http://www.sipac.gov.cn/english/news/201910/t20191023_1065461.htm



SIP News in Oct The 10th CHInano Opens in SIP



The three-day CHInano 2019 Conference & Expo (the 10th CHInano for short) opened at Suzhou International Expo Centre, SIP on 23 October, gathering a host of Chinese and overseas nanotech experts and professionals as well as over 1,600 exhibitors from 27 countries.

The event, focusing on MEMS manufacturing, third-generation semiconductors, nano materials, flexible and printed electronics, ink-jet printing, energy conservation and environmental protection, consists of one main forum and 16 specialized forums and an exhibition of nanotech and peripheral products in a 20,000-square-meter zone.

Several research institutes were inaugurated concurrently, expected to significantly drive nanotech development, innovation and commercialization in SIP.

In addition, 14 enterprises signed agreements with SIP Administrative Committee at the opening ceremony to launch their nanotech projects in SIP.

23 October 2019

http://www.sipac.gov.cn/english/news/201910/t20191024_1065915.htm

