GLASGOW COMPUTING SCIENCE INNOVATION LAB

world changing innovation in computing science

Foreword: A New Growth Phase for GLACSIL

Phil Trinder, GLACSIL Director

Welcome to the Spring 2025 GLACSIL Newsletter. You'll find a host of opportunities to engage with the School's research in the articles below, and more are outlined at: https://www.gla.ac.uk/schools/computing/industry/

Since its launch last Spring GLACSIL has fostered a host of engagements, including establishing an industrially funded PhD scholarship, and an engaging series of academic/industrial workshops and sandpits.

In the coming months we will be reaching out to founding partners to discover what is working for you, what isn't, and seeking ideas for further engagement. You'll see that there is an interesting programme of events: feel free to suggest topics of interest. We are especially excited to explore possibilities to commercialise the healthtech research in the School: https://www.gla.ac.uk/schools/computing/research/researchthemes/healthcaretechnologies/

GLACSIL is entering a new phase this year. Having launched with 6 founding partners, a key aim now is to grow by attract new innovation driven partners. Existing research partners and Industrial Advisory Board (IAB) members are welcome to apply, and we welcome proposals for other partners by email to compsci-innovation@glagow.ac.uk. In the meantime, we're delighted to welcome new members, Tata Consultancy Services, and School spinout company, KEPSoft to GLACSIL.

Royal Society Entrepreneur in Residence Joins School to Boost Commercialisation

Serial tech entrepreneur **Stefan Raue** has joined the School of Computing Science, bringing dedicated expertise to our research and innovations with commercial potential. Funded by the prestigious **Royal Society Entrepreneur in Residence** initiative, Stefan—a former PhD student at the School—will be seeking out intellectual property with high growth spinout or significant license potential to apply his experience and expertise to through hands on support and guidance.

School research has an outstanding track record in generating real world impact by many channels, but spinout formation has been less common in recent years. Through this 2-year consultant position and associated project, Stefan will bring his experience with tech investors, company formation, growth, scaling and successful exits, as well as substantial technical expertise and market insight to work with School academic staff and our intellectual property portfolio.

Stefan will also focus on creating a sustainable community of practice for entrepreneurs in and adjacent to the School to ensure a legacy of continued entrepreneurship. Academic staff looking to discuss their IP with Stefan can reach him on stefan@streamspotter.net.

Tata Consultancy Services Become Newest Member of GLACSIL

Global technology and consultancy firm, and long-standing partners to both the School and University, Tata Consultancy Services (TCS), are the latest organisation to join Glasgow Computing Science Innovation Lab.

TCS have been active partners of the school through their highly valuable contribution to our Industry Advisory Board, by Head of Scotland, and UK Sales, Gopalan Rajagopalan. This was further consolidated in 2017 through signing of a Memorandum of Understanding between TCS and the University as a commitment to actively assess and pursue collaboration opportunities.

Since then, TCS have partnered with the University across several of our disciplines, for example in the EPSRC STARDUST reliable distributed systems project with Professors Simon Gay and Phil Trinder. The current focus of our collaboration efforts is via a shared interest in Health Technology research, with an event planned in this domain over the coming months, and in possible research training opportunities for TCS staff via our Partnership PhD programme.

Led by G. Subramanian (Subbu), Chief Technology Office – UK and Ireland, TCS will participate in the events and collaboration opportunities offered by GLACSIL, building on Subbu's fascinating insight into TCS research culture when he spoke at GLACSIL's event in June last year.

Subbu said, "We are pleased to further strengthen our relationship with University of Glasgow, that has always been at the forefront of Research and Innovation. As part of our Academic co-innovation network, TCS has invested in research projects at leading universities around the world, including University of Glasgow, to encourage open innovation. By being part of GLACSIL, we look forward to a stimulating exchange of knowledge and a high-synergy engagement across multiple areas, that can solve problems for our customers, business and society at large."

GLACSIL Director, Jill Dykes said "I'm delighted that TCS are joining GLACSIL. As a highly innovative and research-led global leader in technology across multiple industry verticals, the insight and experience TCS bring to our research collaborations and discussion have been invaluable. It's been a pleasure to work with Subbu and Gopalan at TCS over the years and we look forward to engaging with more innovation-focused TCS colleagues through GLACSIL-led events".

School Launches New Social Enterprise Spinout, KEPsoft

A life-saving project set up to better match kidney patients with organ donors has launched as a social enterprise company – the first not-for-profit social-purpose venture to spin out from the University of Glasgow and School of Computing Science. **KEPsoft Collaborative** - the product of four founding European research institutions - will provide software and services to increase the possibilities for kidney patients to find a life-changing match with a living kidney donor. **And, as an innovation led company originating here in the School, they've joined GLACSIL!**

Algorithms developed by the School's **Professor David Manlove** and his colleagues have been used to find optimal solutions for the UK Living Kidney Sharing Scheme (UKLKSS), which is the largest KEP in Europe and operated by NHS Blood and Transplant (NHSBT). Between 2008 and 2024, it is estimated the algorithms led to 600 more kidney transplants taking place, compared to the estimated number that would have occurred had the previous algorithm continued to be used.

Software developed by the company's founding members has been used by national organisations that run kidney exchange programmes (KEPs) within their respective countries to optimise the number of matching donors within the population. The founding members behind the not-for-profit venture are: Portuguese research institute INESC TEC; the Budapest-based HUN-REN Centre for Economic and Regional Studies (KRTK); Óbuda University; and the University of Glasgow.

KEPSoft are one of 2 new members of GLACSIL

KEPs help to increase living donations by allowing recipients who require a kidney transplant, and who have a willing but medically incompatible donor, to 'swap' their donor with that of another recipient, leading to a cycle of transplants. Non-directed donors may trigger chains of transplants that can also benefit multiple recipients. Initially, the focus will be on European transplant organisations, but KEPsoft Collaborative will also engage with organisations beyond Europe, where there are still many countries without KEPs.

Vijay Luthra, CEO of KEPsoft Collaborative and himself a renal transplantee, said: "The social enterprise model allows us to focus on the needs of the most important stakeholders, namely kidney patients waiting for a transplant. It also recognises the collaborative nature of the work, including by our founding members. "Our goal is to make kidney transplantation more accessible to patients around Europe and beyond, and to that end we are most grateful for the financial and operational support provided by The Challenges Group Ventures Lab and by Community Enterprise in Scotland (CEIS)."

Professor David Manlove of the University of Glasgow, and Scientific Adviser to KEPsoft Collaborative, said: "the project has enjoyed wide collaboration including the ENCKEP COST Action (funded by the European Union) which had 28 participating countries. "KEPsoft has also had input from stakeholders from a range of disciplines, including policy makers, clinicians, surgeons, nephrologists, immunologists, computer scientists and economists".

TERRA: Pioneering the Future of Climate Services with Intelligent Water and Coastal Management Solutions

Computing Scientists at University of Glasgow have joined a multi-disciplinary team to work with data from the European Union's space programme, Copernicus, to create and provide innovative tools that model, forecast and manage water and coastal management solutions.

Water is at the heart of global sustainability, powering 90% of economic activities and supporting 75% of the world's jobs. Yet, water-related challenges—such as pollution, flooding, and rising sea levels - rank among the top five global risks, as highlighted by Water Europe. To address these pressing issues, the European Union is launching TERRA: An "InTelligEnt PlatfoRm for Integrating Climate Services" that combines cutting-edge technologies with the capabilities of Copernicus services to redefine water resource management, coastline monitoring, and climate resilience.

TERRA focuses on unlocking the full potential of Copernicus data by integrating Artificial Intelligence (AI), Digital Twin (DT) technology, and Big Data analytics. The project will provide innovative tools for hydrological monitoring, flood forecasting, and coastline management, supporting decision-makers, industries, and local communities in tackling water-related emergencies and long-term challenges. Through its €2M funding from the Horizon Europe Programme, TERRA will develop six advanced services and three product chains, including:

· Flood Risk Prediction and Mitigation: AI-powered models to forecast and manage flood risks.
· Water Pollution Monitoring: State-of-the-art satellite imagery analysis for precise detection.
· Coastline Erosion Management: Digital Twin solutions to predict and mitigate coastal erosion.
· Integrated Hydrological Observation: Tools to monitor water bodies and assess climate change impacts.

These innovations align with the EU Green Deal objectives and contribute to climate resilience and sustainable urban planning. TERRA will demonstrate its capabilities through three use cases:
1. Water Contamination Assessment in coastal areas in Fthiotida, Greece.
2. Detection of Illegal Maritime Activities at the Port of Gdansk, Poland.
3. Coastal Change Monitoring using Digital Twins for erosion and flood prevention in St Andrews, Scotland.

The project brings together nine European partners from academia, SMEs, and research institutions, fostering multidisciplinary collaboration. By bridging Copernicus services with advanced technologies, TERRA strengthens EU leadership in space services and climate innovation. TERRA's groundbreaking solutions will benefit policymakers, urban planners, NGOs, businesses, and citizens.

The teams: Knowledge & Data Engineering System (KDES), School of Computing Science (Drs Christos Anagnostopoulos and Qiyuan Wang), School of Geographical & Earth Sciences (Dr Martin Hurst), and James Watt School of Engineering (Dr Zhiwei Gao) are leading tasks related to interoperable Big Data Management module, Digital Twins & Data Augmentation, and the demonstrator/use case of a Digital Twin for monitoring the Scottish coastal change from satellite remote sensing.

PROJECT WEB & SOCIALS

Webpage: https://terra-horizon.eu/

X: https://x.com/horizon_terra

LinkedIn: https://www.linkedin.com/company/terra-horizon/

Making a Difference—World Leading Research at Glasgow

Congratulations to SoCS reseearchers **Dr Mark McGill** and **Dr Tanaya Guha**, and colleagues, for their award of £204,711 from the AI Safety Institute for their project, **"WearAI: Examining the Societal Vulnerabilities Exposed by AI Embedded in Context-Aware Smart Wearables".**

Their research will examine the **risks and vulnerabilities** to individuals, both users and bystanders, and to wider society, exposed by **mobile AI embedded in everyday / all-day mass consumer wearables**. From Augmented Reality glasses (e.g. Meta Orion), to smart glasses (e.g. Ray-Ban Meta), to smart pins (e.g. Humane AI Pin, Limitless Pendant, Rabbit r1).

These fashionable consumer wearable devices come replete with a variety of requisite sensors underpinning key / desired functionality and contextual awareness - such as 360 or RGBD cameras, directional microphone arrays, GNSS, eye / gaze tracking, physiological biosensing and more. At the same time, wearable platforms are increasingly integrating cloud-based and local AI to get the most out of this sensing, with AI providers targeting efficient, specialist multimodal models with smaller numbers of parameters for on-device AI.

Through this merger of sensing and AI, wearable devices will become an ever-present pair of AI eyes and ears, a form of ambient and ubiquitous computing that travels with us throughout our daily lives – potentially making them indispensable to users by unlocking always-available AI-driven personal assistants, augmented intelligence and cognition and more.

However, the prospect of wearable AI being able to survey, understand and longitudinally monitor our actions, interactions, attention, physiology etc., and surveil our environment and those bystanders within it, risks unlocking a societal panopticon – inferring and aggregating ever-deeper insights into the lives not just of users, **but also those public and private bystanders to these devices**. Such insights expose significant privacy concerns and obvious vulnerabilities that might be criminally exploited.

The project will investigate these risks by:
1. comprehensively mapping the breadth of inferences that can be derived from both generalized and specialised AI models when ingesting wearable-derived sensor data.
2. Categorising and quantifying envisioned use cases and the consequent emergent vulnerabilities and harms exposed by misuse / abuse of wearable AI, and the risks posed to individuals, communities and society as a whole.
3. A pragmatic assessment of existing and prospective mitigations (technical and policy) that could minimize the likelihood, and diminish the severity, of the most high-risk vulnerabilities identified.

The cross disciplinary team expect their outcomes of their research to inform privacy policy and legislation within the UK, European Union, and beyond.
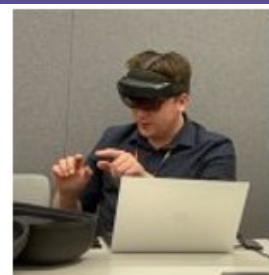

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HOLD THE DATE—Upcoming Events

GLACSIL events, and School research seminars are **open to research and innovation staff of member partners,** and by request from other industry friends and colleagues. In person attendance is encouraged to aid discussion and networking. Some events have remote participation options. Please Visit and **subscribe to all upcoming events and seminars** in the School of Computing Science at **https://samoa.dcs.gla.ac.uk**.

Please contact **compsci-innovation@glasgow.ac.uk** for further information about finding and joining our events, or to suggest event topics.

Artificial Intelligence and Edge Processing
Dr Jose Cano Reyes, School of Computing Science
3rd June, 12:30pm—2pm, Room 422, Sir Alwyn Williams Building
In this hybrid session, Dr Cano Reyes will discuss the latest research in how to overcome the challenges of utilising AI within lower capacity devices at the edge of system networks.
Dr Cano Reyes leads the Glasgow Intelligent Computing Laboratory which focuses on research at the intersection of computing systems and machine learning.
https://samoa.dcs.gla.ac.uk/events/viewtalk.jsp?id=20082

Partnership PhDs—Building Skills for Innovation in Industry

The University of Glasgow continues to offer PhDs in partnership with employers; enabling existing skilled and valued employees the opportunity to conduct research with and for their employer that leads to a PhD qualification, all while maintaining their existing role and salary.

The initiative offers companies:

- an opportunity to retain, reward, and support staff who are pursuing a career in research and innovation,
- world-class training and support with research skills, methods, and communication for staff engaged in innovation,
- a chance to develop and embed highly specialist skills and knowledge and technologies in their business through applied research,
- meaningful collaboration with the University academic experts who supervise and support the PhD student
- a greater range of choice in models of collaboration with the university,
- a model that enables companies to retain ownership of IP generated by their employees during the studentship.

The University is now recruiting companies and employees keen to access this form of training and career development to their employees. For further details please see our **website,** or for an exploratory discussion, please contact:

Jill Dykes, Director, Glasgow Computing Science Innovation Lab
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How to Join GLACSIL

Glasgow Computing Science Innovation Lab is a hybrid venture that brings together that brings the School's research community together with our committed research-led industry partners.
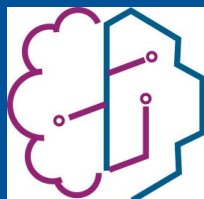
Further information on benefits, how to join, news and events is available at **www.gla.ac.uk/schools/ computing/industry/innovationlab/**.

Share Your News with GLACSIL Partners and the School

GLACSIL industrial partners, colleagues, and friends of the School are invited to share their news in the next edition of this newsletter. News stories for social media distribution can be submitted at any time.

Please email **compsci-innovation@glasgow.ac.uk** with approved text, images and links.

University of Glasgow

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