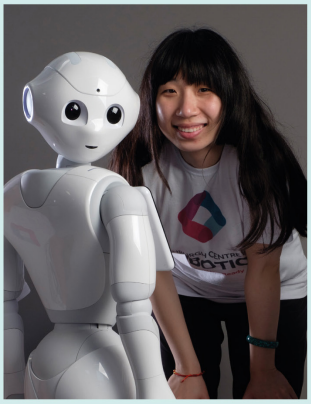
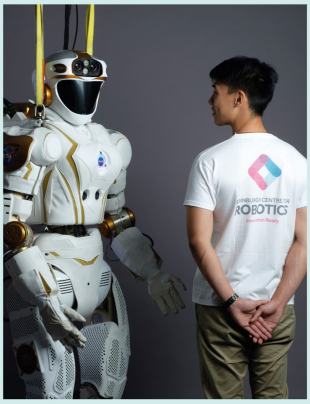
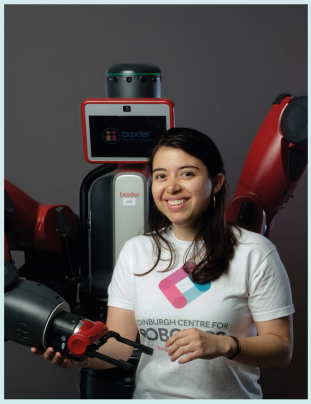
EDINBURGH CENTRE FOR ROBOTICS

Innovation Ready


EPSRC Centre for Doctoral Training in Robotics and Autonomous Systems Newsletter

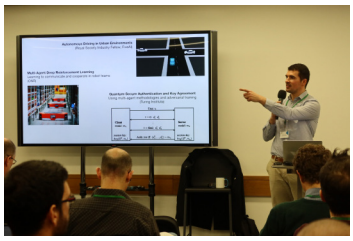
Spring 2020

In this edition

ACHIEVEMENTS

EDINBURGH CENTRE FOR ROBOTICS

Dr Stefano Albrecht lead organiser of the UK Multi-Agent Systems Symposium



Dr Stefano Albrecht from the School of Informatics at the University of Edinburgh was the lead organiser of the UK Multi-Agent Systems (MAS) Symposium which took place on Monday 24th February at the Alan Turing Institute in London.

The aim of the symposium was to explore the MAS research landscape in the UK by bringing together UK-based research labs at universities and in industry who have a significant focus on MAS research.

The Symposium, which was very well attended, included a presentation from Edward Hughes and Yoram Bachrach from DeepMind on recent multi-agent research at their organisation. Sam Devlin from Microsoft Research spoke about Multi-agent learning and evaluation for open world games, and Subramanian Ramamoorthy representing FiveAI, discussed Towards safe-by-design planning for autonomous driving in urban environments. In addition to these presentations, there were also discussion sessions and opportunities for attendees to network. It was intended that this event would allow for the creation of a virtual map with the locations and research foci of UK-based labs which would facilitate future collaborations.

Dr Laura Sevilla wins 2019 Google Faculty Research Award

Dr Laura Sevilla from the School of Informatics at the University of Edinburgh has been awarded a Google Faculty Research Award. The aim of this Google programme is to support the world-class technical research in Computer Science, Engineering and related fields that is performed at academic institutions around the world, giving Google researchers the opportunity to partner with faculty who are carrying out impactful research.

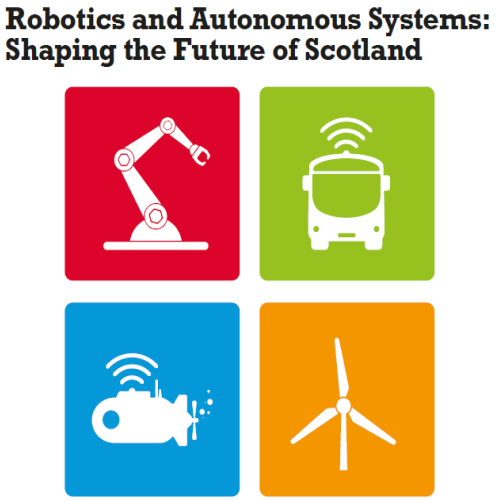
Google received 900 proposals from over 330 universities spread across 50 countries which were vetted by more than 1000 expert reviewers. Proposals were assessed based on merit, innovation, connection to Google's products/services and alignment with their overall research philosophy. Dr Sevilla's proposal was one of 150 selected by Google to receive funding.

Major Grant awarded to Dr Stefano Albrecht

Dr Stefano Albrecht has been awarded a major new grant for "Explainable Reasoning, Learning and Ad-Hoc Multi-Agent Collaboration" from the Office of Naval Research (ONR) with partners at University of Texas in Austin, and University of Birmingham.

This is a 3-year project with a value of USD1M which will address key underlying knowledge representation and reasoning, learning, and multi-agent collaboration challenges by developing algorithms and architectures for Explainable reasoning and learning; Communication in ad hoc teamwork; and Open ad hoc teamwork.

Scottish Science Advisory Council recognises ECR work



The latest report from the Scottish Science Advisory Council (SSAC) on 'Robotics and Autonomous Systems: Shaping the Future of Scotland' has been released and mentioned the work of the Edinburgh Centre for Robotics and the Orca Hub.

The report is available at: https://bit.ly/2Jeo8fw.

Dr Morteza Amajdi gives talk at Durham University

Dr Morteza Amjadi, from the School of Engineering and Physical Sciences at Heriot-Watt University was invited to give a talk at a seminar on Advanced Materials, Electronics & Communications in the Department of Engineering at Durham University. The title of Dr Amjadi's talk was Functional Nanomaterial Composites for Soft Sensing and Actuation and this was presented to an audience of PhD students, Research Associates, and academic staff including the Dean.

National Robotarium's First Research Project Unveiled

SPRING (Socially Pertinent Robots in Gerontological Healthcare) is the first research project to be announced by the National Robotarium.

SPRING, a four-year project funded by Horizon2020, will develop Socially Assistive Robots (SARs) with the capacity to perform multi-person interactions and open domain social conversation for the first time in a healthcare setting. The work builds on the success of Heriot-Watt University's Amazon Alexa Prize conversational AI system `Alana' and is part of a multimillion-pound collaborative project involving experts from eight European and Asian institutions. The project will focus on supporting elderly patients by carefully coupling scientific findings and user-focussed technological developments to bring social robots into gerontological healthcare.

Over the past five years, social robots have been introduced into many public spaces ranging from museums and malls to hospitals and retirement homes. The robots have been able to provide both information and entertainment, but the technology has faced challenges. Limitations include the fact that both the hardware and supporting software is often designed for reactive, single-user interactions, leading to limited one-on-one conversations. As a result, the robots typically wait for commands or questions based on a limited set of scripted actions.

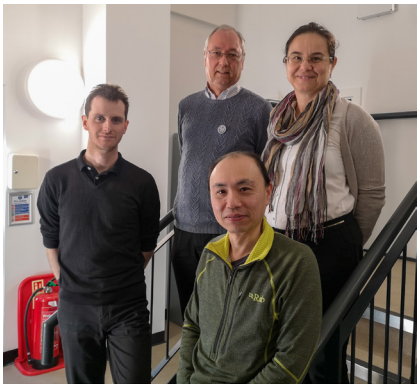
Professor Oliver Lemon, Heriot-Watt University, explains why SPRING is different. He said: "Research shows that the careful use of robots in group settings can have a positive impact on health, such as decreased stress and loneliness, and improved mood and sociability. Healthcare practitioners have been supportive of the use of robots during the non-medical phases of time in hospital because social robots can help explain complex concepts to patients with limited medical knowledge. Social robot technology is of interest for elder care because robot companionship has the long-term potential to better connect people with each other. Social robots could improve both psychological well-being and the relationship between patients and hospital professionals."

"While overcoming the limitations of current social robots raises numerous scientific and technological challenges, it has the potential to create tremendous social impact and economic value. The National Robotarium's focus on creating societal benefits is ideally aligned to addressing such challenges. This type of technology is touch-free and hands-free so will be in great demand in the future as it will reduce the risk and spread of infection."

SPRING will develop new research into conversational AI, computer vision, machine learning and human-robot interaction, alongside human behaviour analysis and sensorimotor robot control. The work will focus on helping social robots to understand various individuals and group situations and take appropriate decisions such as identifying patients that have been waiting alone for a long time or who might be anxious. The social robots will ultimately engage in face-to-face conversation with patients, their family members, staff members, and with whole groups of people.

SPRING's partners include: Inria Grenoble (coordinator), Università degli Studi di Trento, Czech Technical University Prague, Heriot-Watt University Edinburgh, Bar-Ilan University Tel Aviv, ERM Automatismes Industriels Carpentras, PAL Robotics Barcelona, and Hôpital Broca Paris.

Congratulations to Andrew Brock



Left: Andrew Brock, Centre Back: Prof. Nick Taylor, Centre Front: Dr Theo Lim, Right: Prof. Mihaela Dinsoreanu

Congratulations to Andrew Brock who passed his viva.

Andrew's thesis is entitled "Machine Analysis of Engineering Drawings" and presents a holistic data-driven approach to the digitisation of engineering drawings.

His external examiner was Prof Mihaela Dinsoreanu (Technical University of Cluj-Napoca) and his internal examiner was Prof. Nick Taylor (School of Mathematical and Computer Sciences, Heriot-Watt University). Andrew's supervisors were Dr Theo Lim and Prof. Jim Ritchie from the School of Engineering and Physical Sciences at Heriot-Watt University and Nick Weston of Renishaw. Andrew now works for DeepMind in London.

Well done Dr Brock!

Congratulations to Raluca Scona

Congratulations to Raluca Scona who passed her viva.

Raluca's thesis is entitled "Robust Dense Visual SLAM Using Sensor Fusion and Motion Segmentation".

Her external examiner was Dr Stefan Leutenegger (Imperial College, London) and her internal examiner was Dr Sen Wang (School of Engineering and Physical Sciences, Heriot-Watt University). Raluca's supervisors were Prof. Yvan Petillot, School of Engineering and Physical Sciences, Heriot-Watt University and Dr Maurice Fallon formerly University of Edinburgh. Raluca has joined the Dyson Robotics Lab lead by Prof. Andrew Davison at Imperial College London as a Dyson Fellow.

Well done Dr Scona!

Left to Right: Dr Stefan Leutenegger, Raluca Scona, Dr Sen Wang

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Congratulations to Christian Raunch

Congratulations to Christian Raunch who passed his viva.

Christian's thesis is entitled "Visual Articulated Tracking in Clulttered Environments".

His external examiner was Dr Hyung Jin Chang (University of Birmingham) and his internal examiner was Prof. Bob Fisher (School of Informatics, University of Edinburgh). Christian's supervisors were Dr Timothy Hospedales, School of Informatics, University of Edinburgh and Dr Maurice Fallon formerally University of Edinburgh. Christian has joined the Statistical Machine Learning and Motor Control (SLMC) research group at University of Edinburgh and will continue working on visual state estimation methods.

Well done Dr Raunch!

OUTREACH

EDINBURGH CENTRE FOR ROBOTICS

Masterclass in Robotics held at West Linton Primary School

Dr Adam Stokes, Deputy Director of the CDT RAS, along with some of his Post-Doctoral Research Associates, was recently involved in STEM outreach at West Linton Primary School located in the Scottish Borders.

The team delivered a series of weekly interactive classes that focussed on teaching young children about robots, programming and robotic engineering.

The children had the opportunity to engage with small robots and try some basic coding, including gaining experience in programming with Cozmo and Spheros robots. They even built their own soft robot for a competitive 'vegetable harvesting' task.

During one of the workshops the children learned about the Mars Rover and afterwards were able to drive around a TurtleBot from their own 'mission control' to complete various tasks.

The team were grateful for the support provided by the ORCA Hub and RAEng who supplied the robots for this initiative.

Throughout the running of the workshops the team were completely impressed by the children's own knowledge and eagerness to learn. It seems that they may have stumbled across another generation of top engineers!

EVENTS

EDINBURGH CENTRE FOR ROBOTICS

Tuesday, 6th October 2020 - save the date!

Centre for Doctoral Training in Robotics and Autonomous Systems Conference 2020

By invitation only

UKRI Engineering and Physical Sciences Research Council

HERIOT WATT UNIVERSITY

THE UNIVERSITY of EDINBURGH