

# #UKRAS22: The 5th UK Robotics and Autonomous Systems Conference

Patricia Shaw\*, Frédéric Labrosse\*, Myra Wilson\*, David Jones\*, Otar Akanyeti\*, Tomos Fearn\*, Patrick Holthaus†, Jane-Lisa Coughlan‡, and Marianna Knight‡

\*Aberystwyth University †University of Hertfordshire ‡UK-RAS Network

As chairs of the UKRAS 2022 conference, we are happy to welcome you in person after a break from in-person events. The theme of this year's conference is "Robotics for Unconstrained Environments", reflecting much of the robotics research that happens at Aberystwyth University. Unconstrained environments include any indoor and outdoor environment that has not been modified specifically for the robot to perform its task. The premise is that the environment must be representative of the task rather than being artificially simplified.

## I. AIMS OF THE CONFERENCE

The UKRAS conference series has an important aim of inclusion to allow young researchers to present their work and share ideas with peers and more senior researchers. As such, this year's conference attempted to offer as many opportunities for discussions.

The conference also provided a platform to highlight UK robotics research in the area of unconstrained environments.

## II. TOPICS

The papers submitted to the conference certainly dealt with unconstrained environments, ranging from outdoor off-road terrain to nuclear power plants, train tracks, planetary environments, people's homes and care environments, farms, etc. Many papers address specific tasks in these environments, such as teleoperation, task allocation, failure mode analysis, risk assessment, door opening, etc. Others are concerned with hardware design tailored to the physical constraints of specific environments, in particular flying devices, but also climbing and walking. Many papers presented work on combining multiple robots to achieve more than each individual

robot could perform, but also on combining multiple methods and/or sources of information, leading to improved performance and new techniques being developed.

We had three keynote speakers, providing inspiring talks on three very different topics, fitting very well with this conference's theme. The first keynote talk was delivered by Matthew Nancekievill, CEO of Ice Nine. In his talk, Matthew describes what Ice Nine's efforts on developing robotic systems for water management and nuclear applications, giving plenty of anecdotes about the difficulties of working in such unconstrained environments. The second keynote was delivered by Virginia Ruiz Garate. Virginia is an Associate Professor at the University of the West of England (UWE). She talked about assistive robotics in real places, and how this shapes her work. Last but not least, the third keynote was given by Professor Andrew Starr. Andrew is a Professor of Maintenance Systems at Cranfield University and talked about robots used to maintain infrastructure, specifically railways.

## III. STATISTICS

We received 46 submissions, all of very good quality. Each paper was reviewed by at least two reviewers, sometimes more when there was not enough agreement. We tried to involve younger researchers as part of the review team, providing them with the opportunity to gain experience in reviewing papers, a task that is so central to the publication mechanisms.

Of the 46 submissions, 11 were accepted as oral presentations, purely based on the scores given by reviewers (with a limit of no more than one oral presentation per author). A number of papers had been judged not quite ready for acceptance. However, after careful examination of the papers, the

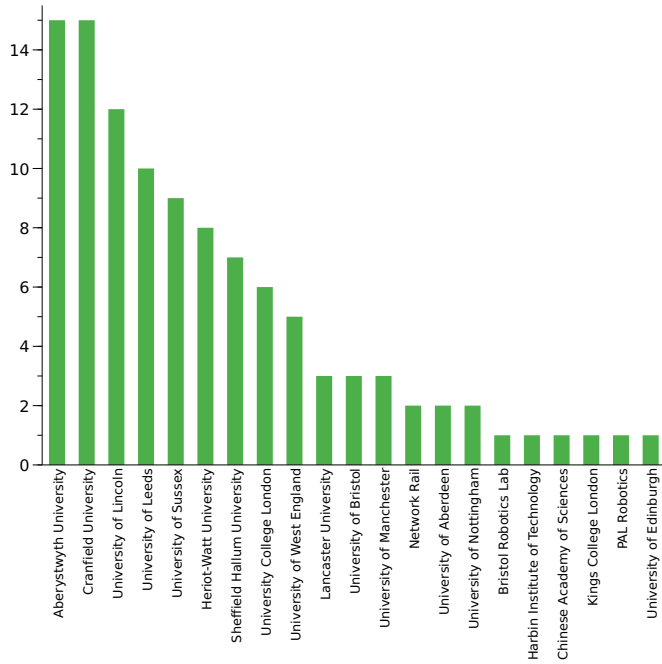


Fig. 1. Author institutions of accepted papers

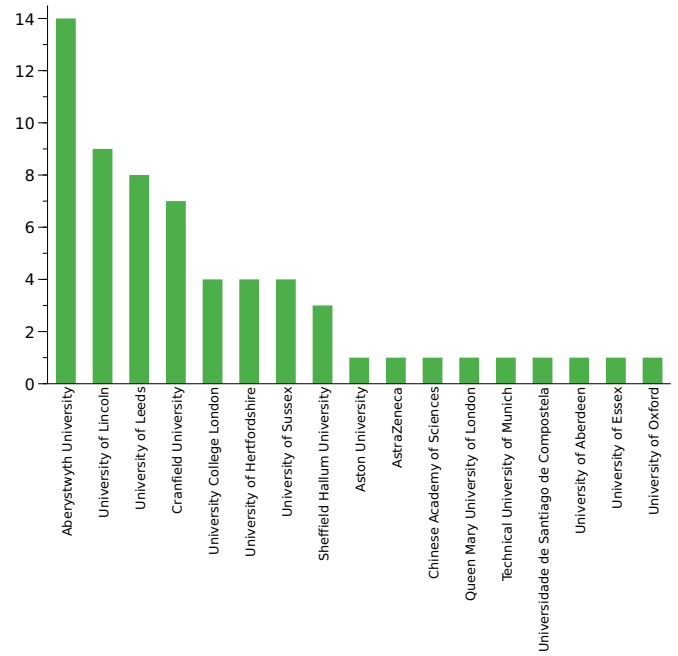


Fig. 2. Reviewer institutions

Programme Committee decided to offer a number of authors a chance to resubmit their paper for further review. Given the time constraints this last review stage was performed by the PC members. Overall, 91% of the papers were accepted.

Three papers were selected by the local Programme Committee based on the quality of the presentation. These papers have been invited to be presented at TAROS 22. The three papers were, in no particular order, presented by Garry Clawson [CF22], Madeleine Darbyshire [DSGL<sup>+</sup>22] and Dexter Shepherd [SK22].

Authors of accepted papers come from 21 different institutions from within the UK-RAS network, mostly UK universities, with some involving collaborators in companies (one based in the UK, one in Spain) as well as overseas universities (in China). Figure 1 shows a count of authors per institution.

Reviewers (148 in total) came from 17 distinct institutions, again mostly Universities in the UK but also one in China and one in Spain, as well as an international company. Figure 2 shows a count of reviewers per institution.

#### IV. FINALLY

We would like to thank all the authors who submitted a paper, all the reviewers who helped with the difficult selection process, all the presenters who

gave such interesting oral and poster presentations. This created a superb conference with plenty of stimulating and inspiring discussions. We hope these will lead to future collaborations and stronger UK robotics research in unconstrained environments.

#### REFERENCES

- [CF22] Garry Clawson and Charles Fox. Blockchain crop assurance and localisation. In *Proceedings of the UK-RAS conference, 2022*.
- [DSGL<sup>+</sup>22] Madeleine Darbyshire, Adrian Salazar-Gomez, Callum Lennox, Junfeng Gao, Elizabeth Sklar, and Simon Parsons. Localising weeds using a prototype weed sprayer. In *Proceedings of the UK-RAS conference, 2022*.
- [SK22] Dexter R. Shepherd and James C. Knight. Evolving complex terrain navigation: Emergent contour following from a low-resolution sensor. In *Proceedings of the UK-RAS conference, 2022*.