

IET Travel report – Lucy Hodgins

The IET travel award allowed me to attend the 2026 International Federation of Automatic Control (IFAC) World Congress. This conference is the largest congregation of control engineers worldwide, held only every three years, and this year attracted approximately 4,500 participants. The conference was held in Busan, South Korea, and focused on a wide range of subject areas related to control, including feedback, modelling, learning control, and links between traditional control approaches and artificial intelligence.

I attended this conference with several objectives. Firstly, I planned to present my research paper and advance my PhD research through attending workshops and talks. The second aim was to network with conference attendees and develop connections that may prove valuable throughout my future career. Finally, I intended to collect audio recordings from conference attendees for my podcast, [Coffee and Control](#). All of these aims were met during the six-day conference.

The paper that I presented was titled “A Hammerstein Model of the Hand for Precise Control of Electrode Arrays”. This work developed a mathematical model to improve current assistive technologies and enable effective hand and wrist rehabilitation after a stroke. Effective control of these systems relies on accurate mathematical models of the hand, however existing approaches are either too complex to be useable in real-time, or are too simplified to adequately capture system behaviour. My work aimed to bridge that gap by developing a model that gave the best of both approaches, being able to accurately represent the true system response whilst remaining computationally tractable.

I got the opportunity to present this work during a technical session focused on biomechanics and physical rehabilitation. This was a particularly valuable experience as it allowed me to receive feedback from researchers outside my immediate research area. I received several interesting questions following the presentation, including some highlighting aspects of the problem that I had not previously considered in detail. This gave me several ideas for potential extensions to my research and provided a useful opportunity to communicate my work to an international audience.

Another particularly valuable part of the conference was the pre-conference workshop that I attended on nonlinear system identification. System identification is an area that I have been actively working on for the past few months, and although I was already familiar with many of the fundamental concepts discussed, the workshop provided new perspectives on the problem and introduced approaches that I had not previously

encountered. One particularly interesting theme was the importance of looking beyond the accuracy of the model to consider its response to perturbations in the parameter values. This insight has given me new ideas for how to analyse the models used within my own research.

Regarding the final aim of this visit, the conference gave me the opportunity to record audio for three episodes of my podcast: one technical, one non-technical, and one [‘conference special’](#).

The technical episode was with a post-doctoral researcher from University of Luxembourg, who has carried out extensive research into the control of robotic systems, recently focusing on soft robotics. We discussed a variety of control strategies for these systems, offering perspectives on an area that I have long found interesting and would like to pursue further in my future career.

The non-technical episode was with an eminent professor from Cornell whose work examines the control of transport and mobility systems. This academic had spent significant time working in research roles in both academia and industry, and we engaged in an insightful discussion about the differences between the two. This was particularly valuable at my current stage of study, in which I am currently considering my career options after completing my PhD and weighing the relative merits of academia and industry.

The final episode involved collecting short segments of audio from a range of conference attendees about their work, which were edited together alongside my thoughts and observations of the event. This gave a unique mechanism for me to network and interact with a wide range of conference attendees, from master’s and PhD students all the way up to the plenary and semi-plenary speakers. It also provided an informal way of networking and learning about research areas that I would not otherwise have encountered. In particular, I engaged in conversations with one plenary speaker about the links between his work in dextrous robotic manipulation and my own work in rehabilitation systems. I also conversed with one of the semi-plenary speakers about how the approaches she had developed for robotic rehabilitation could be applied to my work. Through collecting audio for the podcast I also engaged in several conversations about potential future post-doctoral positions, which I hope will prove valuable as I approach the end of my PhD.

Overall, attending the IFAC World Congress made a significant contribution to both my research and professional development. The IET Travel Award enabled me to present my work to an international audience, gain valuable technical insights, establish new professional connections, and identify future research directions. The experience has had a direct positive impact on the final stages of my PhD and the planning of my future career.