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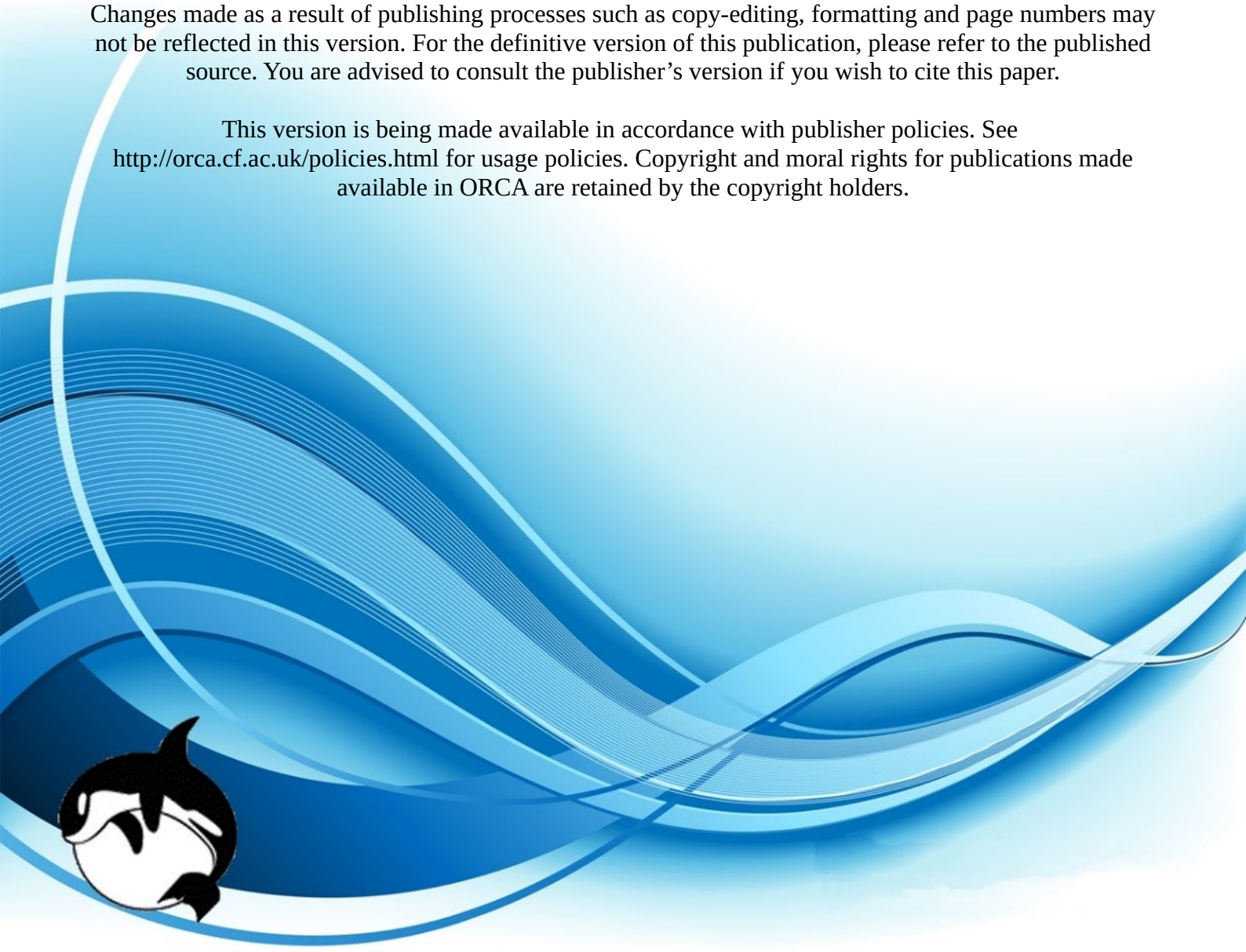

Challenges and opportunities for the adoption and integration of Human-Robot Interaction technologies

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CCS Concepts

• **Human-centered computing → HCI theory, concepts and models**; • **Hardware → Emerging technologies**; • **Social and professional topics → Computing and business**.

Keywords

Adoption, Uptake, Integration, Human-Robot Interaction (HRI)

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1 Overview

The integration and adoption of Human-Robot Interaction (HRI) technologies present numerous challenges and opportunities, with adoption referring to the stage in which they are initially selected for use, and integration referring to a sense of acceptance and transparency within the user environment once they've been adopted [Eneh(2010)]. As we move towards a hybrid society where we must coexist with agents such as robots, issues such as privacy concerns, ethical considerations, and the potential displacement of human workers by robots need to be addressed. However, the opportunities are equally compelling, including improved efficiency, enhanced safety in hazardous environments, and the potential for robots to assist in tasks that are physically demanding or repetitive for humans. We propose to run a workshop on the challenges and opportunities that the adoption and integration of HRI technologies pose in the creation of this hybrid society as a crucial platform for researchers, developers, and other stakeholders to collaborate, share insights, and address these opportunities and challenges collectively. By fostering interdisciplinary dialogue, our workshop can catalyse innovation by fostering discussion, establishing best practices, and informing policies surrounding the responsible integration of robots into society and Industry. Furthermore, the community stands to gain invaluable knowledge, networking opportunities, and the chance to shape the future of HRI technologies while considering the technological and social factors that play a crucial role in the adoption and integration of such technologies. With this workshop, our main objective is to create a welcoming environment to discuss the issues surrounding the adoption and integration of Human-Robot Interaction technologies in different topic areas, as well as to explore together with attendees the potential ways forward to improve this.

2 Goals and Objectives

Our main objective is to create a collaborative environment where researchers, developers, and stakeholders can engage in meaningful dialogue. We aim to bring together experts from diverse fields within the HAI community — robotics, psychology, ethics, and engineering — to encourage interdisciplinary discussions and promote holistic approaches to HRI challenges. We will openly explore ethical questions related to privacy, consent, and transparency, identifying issues and best practices, and proposing responsible guidance for HRI development.

3 Workshop Structure

This workshop is a half-day workshop. Participants will be invited to submit a 2-page extended abstract on the topic of challenges and opportunities for the adoption and integration of Human-Robot Interaction technologies. Some of the areas covered are (this is not a comprehensive list): agriculture, automotive, health care, social care, education, household use, and hospitality. Those participants with accepted contributions will be invited to present a 3-min. pitch during the workshop. Among those with accepted submissions, two of them will be invited to be part of a panel discussion on the topic with our keynote speaker.

Table 1: Tentative schedule

9.00 - 9.10	Welcome and intro
9.10 - 9.50	3-min. pitches
9.50 - 10.00	Break
10.00 - 10.30	Keynote + Q&A
10.30 - 11.00	Panel discussion
11.00 - 11.10	Break
11.10 - 11.50	Interactive discussion activity with all attendees
11.50 - 12.00	Closing

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To improve accessibility we will ensure provision for online attendance when necessary, and as indicated by the conference organisers. For this, we will use the platform preferred by the conference organisers (e.g., Google Meet, Zoom, Microsoft Teams). Tools that facilitate interaction and engagement such as Poll Everywhere or Mentimeter will be used.

3.1 Keynote Speaker

David Rose. Professor David Rose, Chair at Harper Adams University, specialises in sustainable and equitable agricultural transitions. As a Rural Geographer, he focuses on several critical areas: technology adoption by farmers, behavioural change, responsible innovation, and mental wellbeing. His empirical studies in the UK inform responsible innovation, particularly in the realm of agricultural robotics. Professor Rose's contributions to reports and white papers, including the FAO's 2022 SOFA report on autonomous agriculture, demonstrate his expertise. Additionally, he serves as an Editor at the Journal of Agricultural Education and Extension and is a keynote speaker at the 16th International Conference on Precision Agriculture in Manhattan, Kansas (2024).

4 Expected Outcomes

We have two main expected outcomes. 1. Establishment of a knowledge exchange network of interdisciplinary experts in HRI interested in improving the adoption and integration of HRI technologies to help shape a better hybrid society; 2. A joint report containing the main aspects discussed during the workshop, with the areas covered, the opportunities and challenges addressed, as well as the proposed steps forward.

5 Expected Audience

The workshop is open to all researchers interested in the topic, at various stages of their career including PhD students, Post-docs and Professors, as well as those working in Industry settings. The aim is to get an audience of approximately 15 participants across all career stages.

6 Call for Papers Plan

Participants will be invited to submit an 2-page extended abstract with their contribution, which will be peer-reviewed by the workshop organisers (and members of their network if there is a conflict of interest). Papers will be published on the workshop website, if they are accepted and the authors consent to it, and presented during the workshop.

We will circulate a call for participation via mailing lists for the Human-Robot Interaction and robotics communities (e.g., robotics-worldwide, euRobotics-dist), and mailing lists for other disciplines where there could be an interest in adoption and integration of HRI technologies. We will advertise the event across our international networks, which comprise academic, industry and governmental contacts, as well as in other events that we may attend before HAI 2024.

To reach a wider audience, we will advertise the workshop and its website on social media platforms (e.g., X/Twitter, Threads, Instagram, Facebook) and via platforms provided by the institutions the organisers are affiliated with.

7 Special Requirements

- Projector and screen for presentations;
- Main microphone and speaker for presentations;
- Wireless microphone for audience questions;
- 3 chairs for panellists;
- Wi-fi connectivity.

8 Organisers

Alex Elias. Alex Elias, is a PhD student at the University of Lincoln's School of Computer Science, focuses on the adoption and integration of collaborative robots in industry. His comparative study between the agri-food and automotive sectors examines how past adoption attempts impact end-users and stakeholders. With experience in facilitating workshops, including "Guiding Robot Guides," Alex collaborates with stakeholders to explore challenges and opportunities in hastening Human-Robot Interaction (HRI) technology adoption.

Carolina Camacho Villa. Carolina Camacho Villa is a Senior Lecturer in the Lincoln Institute for Agri-Food Technology where she works in the social aspects of agri-food technology. She has an interdisciplinary background that brings an integral approach to the design, development and deployment of agri-food technologies and their contribution to agri-food challenges. In her research she has applied participatory approaches using workshops to facilitate the integration of different views and voices into technology transformation processes.

Bethan Moncur. Bethan Moncur is a PhD student in the Institute for Manufacturing, University of Cambridge, as part of the EPSRC-funded CDT in Agri-Food Robotics and Autonomous Systems. Her research explores how technologies, such as simulation modelling and augmented reality, can support manufacturing decision-making. In particular, Bethan is interested in how to support decisions to adopt and integrate robotics into food manufacturing contexts.

Maria Jose (Marisé) Galvez Trigo. Marisé is Lecturer in the School of Computer Science and Informatics at Cardiff University and Co-Investigator of the UK Robotics and Autonomous Systems Network Plus (UK-RAS+). She has a multi-disciplinary profile in Computer Science, Engineering, Human Factors, and Rehabilitation and healthcare research; Her main interest are robotics, Human-Computer Interaction (HCI), Human-Robot Interaction (HRI) and the applications of Machine Learning (ML) in those areas. Marisé has led the organisation of numerous events and workshops, with some recent examples being the ICRA 2023 Forum on Robotics and Autonomy in Sustainability, the RO-MAN 2023 workshop on Human-like computing for safe collaborative robots in manufacturing and healthcare, and the UK-RAS 2023 International Robotics Showcase, which welcomed over 200 attendees.

Acknowledgments

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