

## **Proposal for a Special Session at IEEE RO-MAN 2023**

### *Humanoid Robots in Healthcare: exploring real world applications*

#### **Aim and Scope of the Special Session**

In recent years there has been a clear growth on the interest regarding humanoid robots in several everyday contexts [1]. We accordingly propose a special session on this topic for RO-MAN 2023 with the aim to contribute to this year's theme of designing a new bridge for HRI. In this session, we will explore the challenges and opportunities of communication between humans and humanoid robots linked to real world applications in healthcare.

With the increasing technological readiness of humanoid robots like ARI [2], EVE [3], HRP-4 [4], Pepper [5], and others, new challenges have risen in the attempt to bring humanoid robots from the research labs and developers' facilities to the real world. Aspects such as the ethical challenges [6], legal [7], safety & security [8][9] specifications, issues with usability and acceptability [10] in deployment, and operational concepts [11] can present significant barriers to a smooth implementation – how can these aspects be tackled early in the process of implementing humanoid robots for healthcare? This special session aims to highlight the specific challenges of the application domain. Moreover, since these challenges, so far, have received comparatively little attention, we present an opportunity for researchers to consolidate their efforts and exchange their experience and expertise working in real-world healthcare applications.

We aim to nurture a diverse community of experts and aim to encourage classical research topics in human-robot interaction to present their research within the specific context of healthcare, e.g. to investigate how different approaches and interests of user groups (patients, healthcare staff, health services administration, and even the patients' families) could be accommodated. Possible Topics:

- Experiences and approaches in real world projects
- Ethical aspects in human-robot interaction in the health context
- Safety and privacy issues
- Healthcare staff and patients' perspectives
- Discussion of the relevance of humanoid robots in healthcare

#### **Organizers**

**[Alexandra Fernandes], [Senior Researcher]**

[Humans and Automation, Institute for Energy Technology, Norway]

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Short Bio: Alexandra Fernandes is a senior research scientist at the Humans and Automation Department in the Institute for Energy Technology in Norway. She has a PhD on Cognitive Sciences and Experimental Psychology from the University of Minho, Portugal (2012). She works in human factors topics, human performance, and human-machine interaction since 2012 in domains such as nuclear industry, petroleum, space applications, and transport. More recently she has focused on human-automation collaboration and human-robot interaction, mostly within the healthcare sector. Since 2020 she has been leading the research activities on the project Human Interactive Robotics for Healthcare (HIRo), funded by the Norwegian Research Council, which motivated this Special Session Proposal.

**[Linda Sørensen], [Head of the Technological Intervention Centre at Sunnaas Hospital]**

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Short Bio: Linda Sørensen is head of the Technological Intervention Centre at Norway's largest rehabilitation hospital, Sunnaas Rehabilitation Hospital. She is an Occupational Therapist Specialist with experience in providing assisting technologies to support independence in users with physical disabilities. She works with businesses and clinicians with testing of innovations for healthcare, with a special focus on robotics. She is currently a PhD student at the University of Agder, investigating persons with physical disabilities' needs for, acceptance and experience of Humanoid robotic assistance in activities of daily living. She is also the project manager of Human Interactive Robotics for Healthcare (HIRO), funded by the Norwegian Research Council.

**[Patrick Holthaus], [Senior Research Fellow]**

[Adaptive Systems Research Group, University of Hertfordshire, UK]

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Short Bio: Patrick Holthaus is a Senior Research Fellow at the University of Hertfordshire (UK) and an advisory board member of the HIRO project. His research focus is social robotics, including a robot's nonverbal robot signalling, social credibility, and trust in assistive robots. As manager of the Robot House research facility, a unique research facility for human-robot interaction, his research brings together real-world applications and fundamental robotics research. Patrick is experienced in conference organisation, having been general chair (UKRAS'21), publication chair (HAI'17), co-organiser of eight international workshops, frequent session chair, and co-organiser of special sessions. He is further experienced in editing and reviewing in his role as associate editor of three international journals, having co-edited more than five special issues and reviewed over 50 conference and journal articles.

**Tentative Speakers**

We commit to promote and increase the visibility of the session through popular channels to reach members of the community. We expect submissions from experts in the fields of humanoid robotics, assistive robotics, and social and ethical human-robot interaction. The following have confirmed interest:

1. Alessandro Di Nuovo, Sheffield Hallam University, United Kingdom
2. Arshia Khan, University of Minnesota Duluth, United States of America
3. Diana Sapaclan, University of Oslo, Norway
4. Henrik Skaug Sætra, Østfold University College, Norway
5. Patrick Holthaus, University of Hertfordshire, United Kingdom
6. Praminda Caleb-Solly, University of Nottingham, United Kingdom
7. Sara Cooper Amundarain, Honda Research Institute, Japan
8. Tobias Mahler, University of Oslo, Norway
9. Weitian Wang, Montclair State University, United States of America

We aim to provide the perspective of leading manufacturers of robotics for healthcare and foster discussion about how to integrate foundational research with existing and future robotics technologies for healthcare. We confirmed interest from Halodi Robotics (Norway) with an invited talk by Egil Utheim (title to be defined) and will approach PAL Robotics (Spain).

## References

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