Introduction to Journal of Human-Robot Interaction Special Issue on HRI Education

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We are happy to present this Special Issue on Education in Human-Robot Interaction (HRI) to the community. As HRI has matured as a field, it is also becoming an increasingly popular educational topic and resource at all levels of instruction, from elementary through graduate programs. While several excellent review articles for the field exist, there is no textbook or recognized curriculum in HRI. The interdisciplinary nature of the field presents students and instructors with opportunities for building on diverse perspectives from design, engineering, computer science, and the social sciences and humanities, as well as challenges in presenting and working with material from such a broad array of disciplines. The authors in this special issue discuss their experiences with and strategies for designing HRI curricula and teaching HRI to students of diverse backgrounds and skill sets. We hope this special issue will inspire many more courses, summer schools, and educational outreach activities in HRI. We also hope that it sparks more discussions about diverse approaches to and necessary standards for HRI curricula.

Keywords: human-robot interaction, education, curriculum, outreach

As the pages of this journal can attest, the field of Human-Robot Interaction (HRI) is diverse in terms of the problems it tackles, the methods it uses, and the disciplinary foundations on which HRI research builds. It is also still young, developing best practices and standards (Burke et al., 2007; Murphy et al., 2010). The techniques for teaching HRI and the topics that can be presented in a course on the field are as varied as the discipline itself. The motivation for this special issue is to discuss different educational practices, experiences, and curriculum ideas for teaching HRI in classrooms from elementary through graduate school. We hope it will stimulate discussion and give stakeholders the opportunity to frame the direction of HRI education as the field continues to grow, and that this process will be a start to developing a set of best practices and standards in HRI education that can support further growth and development of the field. This Special issue was inspired by the HRI Education workshop held at HRI 2015 in Portland, Oregon (Berry, Bethel, & Šabanović, 2015) and builds on some of the topics addressed at the Young Researchers in HRI Workshop held in conjunction with HRI 2006 (Burke, Murphy, & Kidd, 2007).

The papers in this issue discuss how we can approach HRI education from a variety of disciplinary perspectives, including theatre, cognitive science, engineering, and computing and point out how learning in the HRI domain can contribute to other disciplines. The papers also examine teaching HRI to diverse audiences, such as undergraduate, graduate, K–12, and students with special needs. The authors come from diverse perspectives, and their submissions bring to the forefront the importance of interdisciplinarity to HRI as a problem-based domain of research and design. Montebelli et al., in particular, provides a historical perspective on HRI, arguing for its uniqueness as an interdisciplinary field that combines studies of artificial and natural cognition with engineering and interaction design, including opportunities for analysis and synthesis. Through the InDia wheel, they provide a framework for

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teaching students to appreciate and practice within this interdisciplinary space, which allows for the incorporation of different epistemological perspectives engaging with each other in an ongoing dialogue.

Young’s paper describes the design and implementation of a curriculum that brings together social and technical concerns inherent in the interdisciplinary space of HRI. Through readings from diverse disciplines and hands-on projects, the course aims to provide more technically oriented students with experiences that help them appreciate the social constraints and meanings of their work. Descriptions of student projects suggest that HRI is a promising way to bring in a greater diversity of perspectives into computing and engineering education.

Bravo, Gonzalez, and Gonzalez point out that the interdisciplinary education potential of HRI has so far been limited to a focus on technical subjects. In contrast to the status quo, they suggest that the development of drama-based activities with robots, in which students can program, observe, and experience scenarios from the point of view of different actors, can bring the educational strengths of robotics to non-technical subjects as well. As a complement to Young’s piece, this suggests that a future step in HRI could be to develop an even closer bridge between the social and technical aspects of everyday human experience, scientific research, technology development, and implementation. Blain et al. describe how non-technical contexts can provide a rich educational space for learning about and developing HRI. Their ‘BUSA dig’ project took inspiration from the real world problems of archeology to provide an open-ended problem space for student learning and exploring in HRI. In creating telepresence robots that would allow them to safely and carefully explore a simulated archaeological dig, students learned how to tackle different HRI problems, including technical challenges and user experience, and applied various HRI principles to existing real-world problems. Finally, Zenk et al. discusses how non-traditional students, such as those in the social sciences and humanities, can benefit from and contribute to HRI research and education. They found HRI to be an appropriate tool for reaching out to students with Autism Spectrum Disorders (ASDs). The two case studies they describe show that HRI can be a recruiting tool to STEM fields for young people and can add an interdisciplinary perspective to the undergraduate education of non-technical majors.

The need for discussion and sharing within the HRI community about motivations for, approaches to, and standards in HRI education has been over ten years in the making. The papers in this issue show the progress that has been made in carving out an inclusive interdisciplinary space for HRI, while the involved research points to areas of future work and inquiry in attracting and training diverse groups of students to tackle HRI problems in the real world.

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References

