

Robots for Learning - R4L

Inclusive Learning

Wafa Johal
CHILI/LSRO Labs
École Polytechnique
Fédérale Lausanne
Lausanne, Switzerland
wafa.johal@epfl.ch

James Kennedy
Disney Research
Pittsburgh, USA
james.kennedy@disneyresearch.com

Vicky Charisi
University of Twente, NL
University College London,
U.K.
vicky.charisi.14@ucl.ac.uk

Hae Won Park
Personal Robots Group
MIT Media Lab
Cambridge, MA
haewon@media.mit.edu

Ginevra Castellano
Department of Information
Technology
Uppsala University
Sweden
ginevra.castellano
@it.uu.se

Pierre Dillenbourg
CHILI Lab
École Fédérale Polytechnique
Lausanne
Switzerland
pierre.dillenbourg@epfl.ch

ABSTRACT

In recent years, research in Human-Robot Interaction has increasingly attracted interest from the field of education in particular. However, this interest is not new: the logo turtle entered schools nearly 40 years ago. Over this period, robots have changed a lot: sequentially or eventually programmable, they also integrate a wide spectrum of sensors and actuators. Hence, new applications in educational contexts can now be envisioned. The Robots for Learning (R4L) workshop is in its 4th series, and the focus of this edition is on *inclusive learning*. Robots as educational agents have been studied and deployed in various forms - as tools, mediators, tutors, and peers. In this workshop, we aim to discuss the approaches and challenges of developing these educational robots to be more inclusive, helping learners of different ages, backgrounds, genders, and learning abilities. Learners with difficulties often need more attention or personalised training. With this workshop, we aim at discussing recent advances in empirical and theoretical state-of-the-art research contributions on human-robot interaction in educational contexts on the following challenges: How to design robots to adapt to learners abilities? How to build long-term learning with robots? How can robots engage learners in playful learning activities? How can robots assist learners in multimodal learning scenarios?

Organizers

Wafa Johal, École Polytechnique Fédérale Lausanne, Switzerland. Wafa Johal obtained her PhD in 2015 from the University of Grenoble (France) focusing on bodily signals in Child-Robot Interaction. She is a Postdoctoral researcher in the Computer and Human Interaction Laboratory for Learning and Instruction at EPFL. She works within the CoWriter and Cellulo projects dealing with robots for education.

James Kennedy, Disney Research, Pittsburgh, USA. James Kennedy received his PhD from Plymouth University, U.K. in 2017 for his work using social robots to tutor children. During his PhD, he worked in collaboration with the EU-funded DREAM, ALIZ-E, and L2TOR projects. He currently works as part of the Language Based Character Interaction group at Disney Research, focusing on the development of AI characters.

Vicky Charisi, University of Twente, The Netherlands and University College London, U.K. Vicky Charisi is a postdoctoral researcher at the Human-Media Interaction group at the University of Twente. She completed her PhD studies at the UCL Institute of Education, U.K. focusing on child development within computer-supported music-making activities. Currently, she works on the topic of child-robot interaction designing robots for formal educational settings (EASEL) and playful activities (SQUIRREL) for children.

Hae Won Park, Massachusetts Institute of Technology, USA. Hae Won Park is a Research Scientist at the Personal Robots Group at the MIT Media Lab. Her research focuses on personalization of social robots to enable a long-term interaction between users and their robot companions. Her work spans a range of applications including education for young children and well-being benefits for the elderly. Hae Won received a PhD from Georgia Tech where she also co-founded Zyrobotics, an assistive education robotics startup.

Ginevra Castellano, Uppsala University, Sweden. Ginevra Castellano is an associate senior lecturer in intelligent interactive systems at Uppsala University, where she leads the Social Robotics Lab. She was the coordinator of the EMOTE project (2012-2016), which developed educational robots to support teachers in a classroom environment.

Pierre Dillenbourg, École Fédérale Polytechnique Lausanne, Switzerland. Former teacher in elementary school, Pierre graduated in educational science (University of Mons,

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the owner/author(s).

HRI '18 March 05-08, 2018, Chicago, IL, USA

© 2018 Copyright held by the owner/author(s).

ACM ISBN .

DOI:

Belgium). His research on learning technologies started in 1984. He obtained a PhD in computer science from the University of Lancaster (UK), in artificial intelligence applications for educational software. He is currently full professor in learning technologies, head of the CHILI Lab involved in both CoWriter and Cellulo projects.

Workshop Overview

We propose to organize a full-day workshop on the topic of Robots for Learning. The workshop will include:

- Lightning talks: authors of accepted papers will provide short introduction of their posters.
- Poster sessions: authors of accepted papers will present posters in the morning sessions.
- Keynotes: invited senior researchers will share their perspectives and experiences on the field of technologies for education.
- Structured group discussions: workshop attendees will engage in discussions on principal research questions or debates in the robots for education.

Provisional Full Day Workshop Schedule

(to be synchronized with refreshments and lunch arrangements)

9:00-9:10	Welcome	12:20-13:45	Lunch
9:10-9:45	Keynote 1	13:45-14:20	Keynote 3
9:45-10:00	Lightning talks	14:20-15:20	Poster session 2
10:00-10:30	Coffee break	15:20-15:45	Coffee break
10:30-11:05	Keynote 2	15:45-17:00	Semi-structured group discussions
11:05-11:20	Lightning talks	17:00-17:45	Panel discussion & Wrap up
11:20-12:20	Poster session 1		

Target Audience and Approach for Recruiting Participants

We invite authors to report previous research, practice and interest in developing application in educational robotics. Researchers from HRI, robotics and educational backgrounds will be invited to contribute. The workshop will be advertised by sending a call-for-papers (presentations and posters) on robotics mailing lists and using social networks. Various projects involved in the organization will also be encouraged to participate (L2TOR, SQUIRREL, DE-ENIGMA, Baby Robot, CoWriter, Cellulo, SAR NSF Expedition, eCUTE, DREAM, ANIMATAS). Previous editions of this workshop were held at RoMan 2016 and HRI2017. The workshop will also be advertised to the people who attended the previous editions.

Call for papers: 20 December 2017
 Submission deadline: 31 January 2018
 Notifications: 7 February 2018

Organizational Plan

Papers will be reviewed for appropriateness and scientific and technical soundness. Priority will be given to papers which fit the theme of the call, which are complementary, and which offer a range of theoretical and cultural perspectives.

Plan for Documenting the Workshop

The proceedings of the workshop will be made available on our website as well as arxiv.org.

Invited Speakers

Brian Scassellati, Yale University (confirmed)

Friederike Eyssele, Bielefeld University (confirmed)

Cynthia Breazeal, MIT (confirmed)

Ayanna Howard, Georgia Tech (contacted)

List of topics

- Adaptive mechanisms for robot tutors, personalization and adaptation algorithms for tutoring interactions
- Design of autonomous systems for tutoring interactions
- Theories and methods for tutoring (pedagogical and language acquisition)
- Shared knowledge and knowledge modelling in HRI
- Human-robot collaborative learning
- Attachment and learning with a social robot (social and cognitive development)
- Engagement in educational human-robot interaction
- Human-robot relationship assessment
- Designing student models and assessing students learning
- Playful learning with a robot
- Human-robot creativity
- Kinesthetic and non-verbal communication in human-robot interaction
- Impact of embodiment on learning
- Technical innovation in learning or teaching robots
- Long term learning interactions, design and methodologies for repeated human-robot encounters
- Robots for learners with special needs and special abilities
- Education and re-training for adults
- Rehabilitation and re-education
- Privacy and ethical issues in robot tutoring applications