

# Robots for Learning

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

Mirjam de Haas  
Tilburg center for Cognition and  
and Computation  
Tilburg University  
Netherlands  
mirjam.dehaas@uvt.nl

Paul Vogt  
Tilburg center for Cognition  
and Computation  
Tilburg University  
Netherlands  
p.a.vogt@uvt.nl

Ana Paiva  
IST  
University of Lisbon  
Portugal  
ana.paiva@inesc-id.pt

James Kennedy  
Centre for Robotics and  
Neural Systems  
Plymouth University  
United-Kingdoms  
james.kennedy@plymouth.ac.uk

Ginevra Castellano  
Uppsala University  
Sweden  
ginevra.castellano@it.uu.se

## ABSTRACT

An increasing amount of HRI research focuses on the development of social robots acting as tutors. While robots have been popular as a focus for STEM teaching (see Lego Mindstorms or Thymio), the use of robots as tutors is novel. The field of HRI has started reporting on how to make effective robot tutors and how to measure their efficacy. These studies have shown that the potential of robots in educational settings is inarguable: robot can provide educational content tailored to the individual, something which is missing from current educational settings. They also have the potential to enhance learning via kinesthetic interaction, can improve the learner's self-esteem and can provide empathic feedback. Finally, robots have been shown to engage the learner, to motivate her in the learning task or to enhance collaboration in a group. However, many questions still remain. For instance, what interaction strategies aid learning, and which hamper learning? How can we deal with the current technical limitations of robots? How should effective lessons be developed and implemented on a robot? Answering these and other questions requires a multidisciplinary effort, including contributions from pedagogy, developmental psychology, (computational) linguistics, artificial intelligence and HRI, among others. The aim of this workshop is to engage scholars who aim to gain expertise in education and in robotics (from instructional design to inverse kinematics, ROS to ZPD, Markov to Piaget) into a new interdisciplinary community working on educational robotics. Participants will benefit from hearing from the forefront of field and from discussions on how to move from fundamental research towards the development of market-ready educational robots.

## CCS Concepts

•Computer systems organization → External interfaces for robotics; •Applied computing → Education; •Human-centered computing → Human computer interaction (HCI);

## Keywords

Human-Robot Interaction, Robots in Education, Tutor Robots, Child-Robot Interaction

## 1. ACKNOWLEDGMENTS

We would like to thank the Swiss National Science Foundation href[http://www.nccr-robotics.ch/National Centre of Competence in Research Robotics](http://www.nccr-robotics.ch/National_Centre_of_Competence_in_Research_Robotics), ...

## 2. ADDITIONAL AUTHORS

Additional authors: Sandra Okita (Teachers College - Columbia University, United States, email: [Okita@exchange.tc.columbia.edu](mailto:Okita@exchange.tc.columbia.edu)), Fumihide Tanaka (University of Tsukuba, Japan, email: [tanaka@iit.tsukuba.ac.jp](mailto:tanaka@iit.tsukuba.ac.jp)), Tony Belpaeme (Centre for Robotics and Neural Systems, Plymouth University, U.K. and Ghent University, email: [tony.belpaeme@plymouth.ac.uk](mailto:tony.belpaeme@plymouth.ac.uk)) and Pierre Dillenbourg (CHILI Lab, École Fédérale Polytechnique Lausanne, Switzerland, email: [pierre.dillenbourg@epfl.ch](mailto:pierre.dillenbourg@epfl.ch)).

## 3. REFERENCES

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 '17 Companion March 06-09, 2017, Vienna, Austria*

© 2017 Copyright held by the owner/author(s).

ACM ISBN 978-1-4503-4885-0/17/03.

DOI: <http://dx.doi.org/10.1145/3029798.3029801>