

# Social Robots to Support Children with Diabetes: an Overview of the ALIZ-E Project

Tony Belpaeme<sup>1</sup>, Paul Baxter<sup>1</sup>, Joachim de Greeff<sup>1</sup>, James Kennedy<sup>1</sup>, Robin Read<sup>1</sup>, Bernd Kiefer<sup>2</sup>, Ivana Kruijff-Korbayová<sup>2</sup>, Valentin Enescu<sup>3</sup>, Georgios Patsis<sup>3</sup>, Hichem Sahli<sup>3</sup>, Bert Bierman<sup>4</sup>, Olivier Blanson Henkemans<sup>4</sup>, Rosemarijn Looije<sup>4</sup>, Mark Neerincx<sup>4</sup>, Raquel Ros Espinoza<sup>5</sup>, Alexandre Coninx<sup>5</sup>, Yiannis Demiris<sup>5</sup>, Antoine Hiolle<sup>6</sup>, Matthew Lewis<sup>6</sup>, Lola Cañamero<sup>6</sup>, Elettra Oleari<sup>7</sup>, Sara Bellini<sup>7</sup>, Marco Mosconi<sup>7</sup>, Clara Pozzi<sup>7</sup>, Francesca Sacchitelli<sup>7</sup>, Alberto Sanna<sup>7</sup>, Giulio Paci<sup>8</sup>, Giacomo Sommovilla<sup>8</sup>, Fabio Tesser<sup>8</sup>, Piero Cosi<sup>8</sup>, Rémi Humbert<sup>9</sup>

<sup>1</sup> *The Cognition Institute, Plymouth University, United Kingdom*

<sup>2</sup> *Deutsches Forschungszentrum für Künstliche Intelligenz, Germany*

<sup>3</sup> *Vrije Universiteit Brussel, Belgium*

<sup>4</sup> *Organization for Applied Scientific Research, The Netherlands*

<sup>5</sup> *Imperial College London, United Kingdom*

<sup>6</sup> *University of Hertfordshire, United Kingdom*

<sup>7</sup> *Fondazione Centro San Raffaele, Milan, Italy*

<sup>8</sup> *National Research Council - ISTC, Italy*

<sup>9</sup> *Aldebaran Robotics, Paris, France*

**Video URL:** <https://vimeo.com/111655200>

**Abstract.** This video presents a brief overview of the ambition and results of the ALIZ-E project. ALIZ-E built social robots to support children with diabetes. The robots were evaluated across hospitals in Europe and served as a support tool for young children, to help children understand their condition and educate children about diabetes management. The video highlights the collaborations between the academics, medical staff, parents and -most importantly- the children.

**Keywords:** social robotics, healthcare, child-robot interaction.

## INTRODUCTION

The ALIZ-E project was a 54 month long European research project running between 2010 and 2014 involving an interdisciplinary team comprised of seven research institutes, one hospital and one medium enterprise [1, 2]. The project aimed to contribute to the development of integrated cognitive systems capable of naturally interacting with young people in real-world situations, with a specific goal of supporting children engaged in a residential diabetes-management course.

The goal of the project was to extend the science and technology behind long-term human-robot interaction. To achieve this, we addressed three related issues in developing interactive robots capable of sustaining medium- to long-term autonomous operation in real-world indoor environments. Firstly, ALIZ-E addressed how long-term experience can be acquired, so the robot could learn its spatio-temporal experiences. Secondly, ALIZ-E addressed how a system can deal robustly with inevitable differences in quality in perceiving and understanding a user and her environment. To this end,

ALIZ-E developed new methods for adaptively controlling how a system invokes and balances a hybrid ensemble of processing methods for perception, action and interaction. Thirdly, ALIZ-E addressed how a system can engage in an intersubjective interaction using potential anthropomorphisation of robots by the user. The long term aim of the ALIZ-E project was to implement believable, long-term, social child-robot interaction.

## RESULTS

Through dozens of studies and field trials, the project has shown that social robots have significant potential for motivating and educating young children. This can be used in educational environments, such as schools, but has significant potential in more targeted environments, such as hospitals, where children have to learn and acquire skills and where motivation is an important aspect of learning.

The creation of autonomous Human-Robot Interaction is one of the greatest challenges faced in robotics. While encouraging progress was made in ALIZ-E many of the more unstructured interactions still require the robot to be remotely controlled. A main obstacle to autonomous social robots appears to be perception: perceiving and correctly interpreting the social environment is as yet an unsolved problem.

## REFERENCES

1. Belpaeme, T., et al. (2012) Multimodal Child-Robot Interaction: Building Social Bonds. *Journal of Human-Robot Interaction*, 1(2), 33-53.
2. [www.aliz-e.org](http://www.aliz-e.org), sponsored by the European Commission, grant reference FP7-ICT-248116