

Reading encouragement for children with humanoid robots

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ABSTRACT

Within the context of a project for the reading encouragement for children, the public library “Stadtbibliothek Wildau” (Germany) in cooperation with the RoboticLab of the TH Wildau has won an innovation award for libraries in Berlin and Brandenburg.

The idea is simple, but as practice has shown, very appealing for children. Children have the possibility to read a book to a humanoid robot and afterwards the robot asks questions about the book. Preschool children, that are not able to read yet, can take a quiz about the alphabet to prepare for reading. In this article, the idea, its implementation, and our practical experiences with children are discussed.

KEYWORDS

humanoid robot, NAO, children, reading, books, Drupal, Angular;

1 INTRODUCTION

The project is supposed to encourage the reading ability of children with the help of a NAO robot¹. Why is this of interest? The reading behavior of children is affected by the time parents or other adults use for reading to them. Reading is fun for 54% of children, whose parents read to them, whereas 38% of children, whose parents did not read to them, like to read books. Also, the duration of children reading, whose parents read to them, is higher, than those, whose parents did not read to them. Though, children think it is comfortable and relaxing when their parents or another adult reads to them. [1] [2] [3] [4]

2 EVALUATION & IMPLEMENTATION

The system is split into three different applications due to various functions that were needed. There is an application running on the NAO robot, that communicates with the children. To make the communication between a child and the robot a better experience, a tablet is used. A web application was developed to use it on most tablets. With the application children are able to perform different actions. They can choose between following appointments with the robot: an

appointment to get to know the NAO robot, read a book to the robot, take a quiz about a book or about the alphabet. With the different appointments the reading comprehension and the understanding of the alphabet is improved. At the beginning of an appointment a librarian enters needed data into the tablet application, such as the name of the child, the type of the appointment and the NAO that is used. If the selected appointment is to read a book to the NAO or take a quiz about a book, the librarian needs to select a book as well. For the quiz the application gets questions through a RESTful Web Service of the website. The website manages the books and their questions. Librarians are able to add books to the database on the website. Volunteers and librarians are then able to add questions about the existing books on the website. The NAO application was developed in Python with the NAOqi and communicates through socket.io with the web application on the tablet. The web application was developed with the Angular framework. The website was developed with the content management system Drupal. Main parts of this application were developed within the scope of Bachelor's theses.

3 CONCLUSION

During a test phase 21 children could try out the application and get to know the robot. It has shown that children and parents are impressed by the robot. Children like reading even more, when the NAO is listening and also find it funny. Their parents think it is a fun way to be even more motivated at reading. The next steps are a composite of extending the functionality and having even more kids to try out the robot.

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¹ <https://www.softbankrobotics.com/emea/en/nao>