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# Intelligent News Conversation with the Pepper Robot

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**Abstract.** The UvA@Home Team develops social behaviours for home-assistance robots. Beside the use of classical techniques for human robot interaction, such as speech recognition, image recognition and language processing, the team strives to explore new means of improving social interactions. To showcase how the inclusion of new fields can improve social behaviour a news-conversation agent will be demonstrated.

## 1 Introduction

Social behaviour is a complex phenomenon and reproducing it on a robot is quite a challenge. Human-like conversation is an important part of social behaviour and requires techniques from a wide range of fields. An especially difficult part of conversation and therefore language processing is the knowledge that is required to engage in it. Humans expect other humans to be aware of general events that are happening in the world. If we want robots to be able to converse like humans they must clearly also have some knowledge of current events [1]. It is to this end that the news conversation module was developed and implemented on the Pepper robot.

The news conversation module retrieves news articles from several sites and parses them to extract the general topics of the article. This knowledge is used to enable users to ask the robot to give them articles on certain topics. Additionally a preference profile of the user is made to in order to occasionally present the user with articles that they might find interesting.

## 2 RoboCup and SSPL

The RoboCup was originally founded in 1977 with the goal of developing fully autonomous humanoid soccer robots. However it has since branched out into many different forms of intelligent robotics. The goal of the @Home league is assisting humans in a home environment [2]. The UvA@Home<sup>1</sup> team participates in the Social Standard Platform League (SSPL) of the @Home League, which uses the Pepper robot and focuses on the social interaction aspect of home assistance, such as reminding users of appointments or take orders during a

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<sup>1</sup> [uvahome.nl](http://uvahome.nl)

party [3]. This league is different compared to the other @Home leagues which put more emphasis on assisting in physical tasks, such as retrieving items or opening doors. In 2017 the UvA@Home team participated in the RoboCup for the first time and plans to return for the 2018 competition.

### 3 Demonstration

The system that will be demonstrated is able to inform a user of news articles with an opinionated undertone [4]. To start interaction, a person first stands in front of the robot, after which the system creates a user profile that is associated with a person by learning that persons face. After this the system will ask the user a series of questions regarding their news preference.

The system collects news from a variety of popular news websites (Reuters, NYT, BBC) and can return articles based on queries made by the user. During conversation, the person can give feedback on specific queries. The system can use this feedback to update the user profile in order to make the results of subsequent queries more relevant to the user.

The system will present its opinion on popular topics at random intervals to create a more natural conversation. Its opinion will be based on a consensus created by gathering posts from Twitter<sup>2</sup> that include the topic. The consensus is determined by doing sentiment analysis on the aggregated posts.

### 4 System summary

The goal of the system is to be a personal assistant that can inform a user about recent events that are relevant to the user. Conversations are made more natural by asking the user for feedback regarding the news articles found and by giving its opinions on popular topics. Because the interface is a robot, interacting with the system is straightforward as no interface is required. The system can be seen working on a Nao robot in the qualification video of the UvA@Home team for the Robocup 2017<sup>3</sup>.

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<sup>2</sup> <https://twitter.com/>

<sup>3</sup> <https://www.youtube.com/watch?v=-i8xgfzAFoQ>