

# Empathic Robotic Tutors - Map Guide

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## ABSTRACT

In this demonstration we describe a scenario developed in the EMOTE project<sup>1</sup>. The overall goal of the project is to develop an empathic robot tutor for 11-13 year old school students in an educational setting. We are aiming to develop an empathic robot tutor to teach map reading skills with this scenario on a touch-screen device.

## Categories and Subject Descriptors

I.2.9 [Artificial Intelligence]: Robotics

## Keywords

Robotic Tutors, Human-robot interaction, Empathy

## 1. INTRODUCTION

We will demonstrate a map task scenario, where the robotic tutor (NAO Torso robot) presents the learner with a series of clues in an art trail on a map application installed on a large touch-screen device. These tasks have been designed to allow the learner to develop map reading skills: directions, distance and map symbols.

The objective is to obtain clues that help finding a treasure. In each task, the learner is asked to find a feature based on its symbol, distance from current location and direction. The robot tutor uses empathic and pedagogical strategies wherein it helps the learner using pedagogical actions such as prompts, pumps, splices, etc. conceding different skills in order to move forward when stuck. It also monitors learner's engagement levels and adapts accordingly by taking the necessary actions.

This interactive demo using a large tablet and the NAO will allow attendees (one user at a time) to complete the art trail through interacting with the robot and select the correct location for a new landmark based on clues found in the trail.

## 2. ARCHITECTURE

Figure 1 explains the architecture components and the data flow between the modules in the system.

- Messages from the Activity (Map application) are sent to the Learner Model.
- The Learner Model uses this information, along with information from the Perception and Affect Perception modules, to estimate the current state of the interaction.
- The Interaction Manager (IM) uses this state information to select an appropriate next high-level system action.
- The Skene module transforms the high-level action specification into a concrete set of words and behaviours for the Robot to perform.
- Skene module also uses low level information from other modules to gaze at the learner and map locations on the touch-screen device.

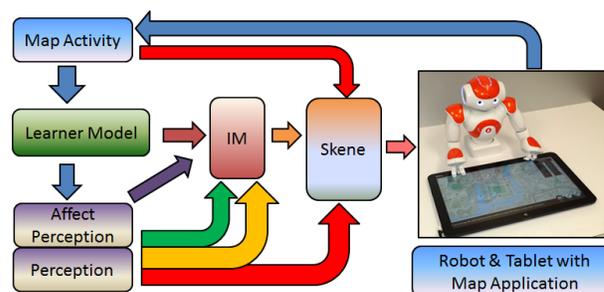


Figure 1: Architecture of the system

The scenario to be deployed in the School is being developed with the robot and big touch-screen device 55". Given the logistical challenges in transporting a full-size touch table, this scenario can be demonstrated with a small touch-enabled 18" tablet and the NAO robot (figure 1), which will be brought to the event.

<sup>1</sup><http://www.emote-project.eu/>

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HRI'15, March 2-5, 2015, Portland, Oregon, USA.

ACM 978-1-4503-2883-8/15/03.

<http://dx.doi.org/10.1145/2701973.2702693>.

<sup>1</sup>Acknowledgements: This work was supported by the European Commission (EC) and was funded by the EU FP7 ICT-317923 project EMOTE. The authors are solely responsible for the content of this publication. It does not represent the opinion of the EC, and the EC is not responsible for any use that might be made of data appearing therein.