

# The Empathic Robotic Tutor

Featuring the NAO Robot (video)

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## ABSTRACT

We present an autonomous empathic robotic tutor to be used in classrooms as a peer in a virtual learning environment. The system merges a virtual agent design with HRI features, consisting of a robotic embodiment, a multimedia interactive learning application and perception sensors that are controlled by an artificial intelligence agent.

## 1. INTRODUCTION

The HRI system presented in this video is being developed in the EU FP7 EMOTE<sup>1</sup> project to be an autonomous artificial robotic tutor in classrooms as a peer in a virtual learning environment (VLE). The VLE consists of a modified version of the Enercities<sup>2</sup> game played in a multi-touch table, and is aimed at school children from the 8th to 10th grades.

## 2. SYSTEM OVERVIEW

The bulk of the interactive system presented has been previously developed in a modular embodied agent design that is integrated using the Thalamus framework [1]. The initial version contained a Wizard-of-Oz component which has now been replaced with an artificial intelligence (AI) component in order to become autonomous. Figure 1 illustrates the system components. While Enercities, Perception and NAO Robot Module provide the interface between users, application and the robot, Skene is used as a behaviour planner that allows the interaction to be controlled autonomously by an AI [2]. The Gameplay Manager performs two roles. Based on the current gamestate and user actions, it selects high-level behavioural intentions that are then decomposed and scheduled in Skene to convey a socially-, empathically-

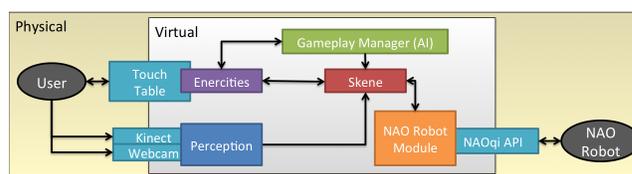


Figure 1: The modular system design.

and pedagogically-aware tutor. It also selects game moves to play according to its current pedagogical strategies, so that the robot's gameplay matches its overall behaviour.

## 3. VIDEO DESCRIPTION

The video shows the robotic tutor interacting with two school children. The main features of the system are: a robotic embodiment, Skene, a social- empathical- and pedagogically-aware decision making component, and perception devices. The video focuses on showing how the multimodal behaviour is managed by Skene with emphasis on its semi-autonomous gazing mechanisms.

## 4. ACKNOWLEDGMENTS

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## 5. REFERENCES

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- [2] T. Ribeiro, A. Pereira, E. Di Tullio, P. Alves-Oliveira, and A. Paiva. From Thalamus to Skene: High-level behaviour planning and managing for mixed-reality characters. In *WASIVA, IVA '12*, 2014.

<sup>1</sup>[www.emote-project.eu](http://www.emote-project.eu)

<sup>2</sup>[www.enercities.eu](http://www.enercities.eu)