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[1] 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[2] 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-
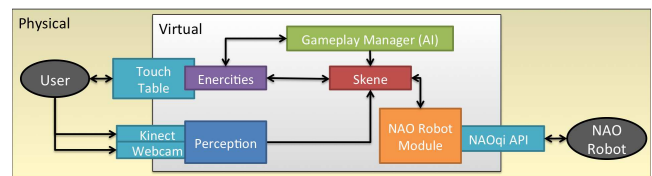
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[1]`www.emote-project.eu`
[2]`www.enercities.eu`

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

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.