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## Cognitive Feedback for Embodied Conversational Agents

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## 1 Introduction

This research work aims to define a model for real-time simulation of multimodal and social behavior of virtual agents when interacting with a learner in an informed virtual environment. We present the main ideas of a cognitive feedback model based on the knowledge of the environment.

**Keywords:** Embodied Conversational Agents; Interaction; Feedback; Learning; Informed Virtual Environment

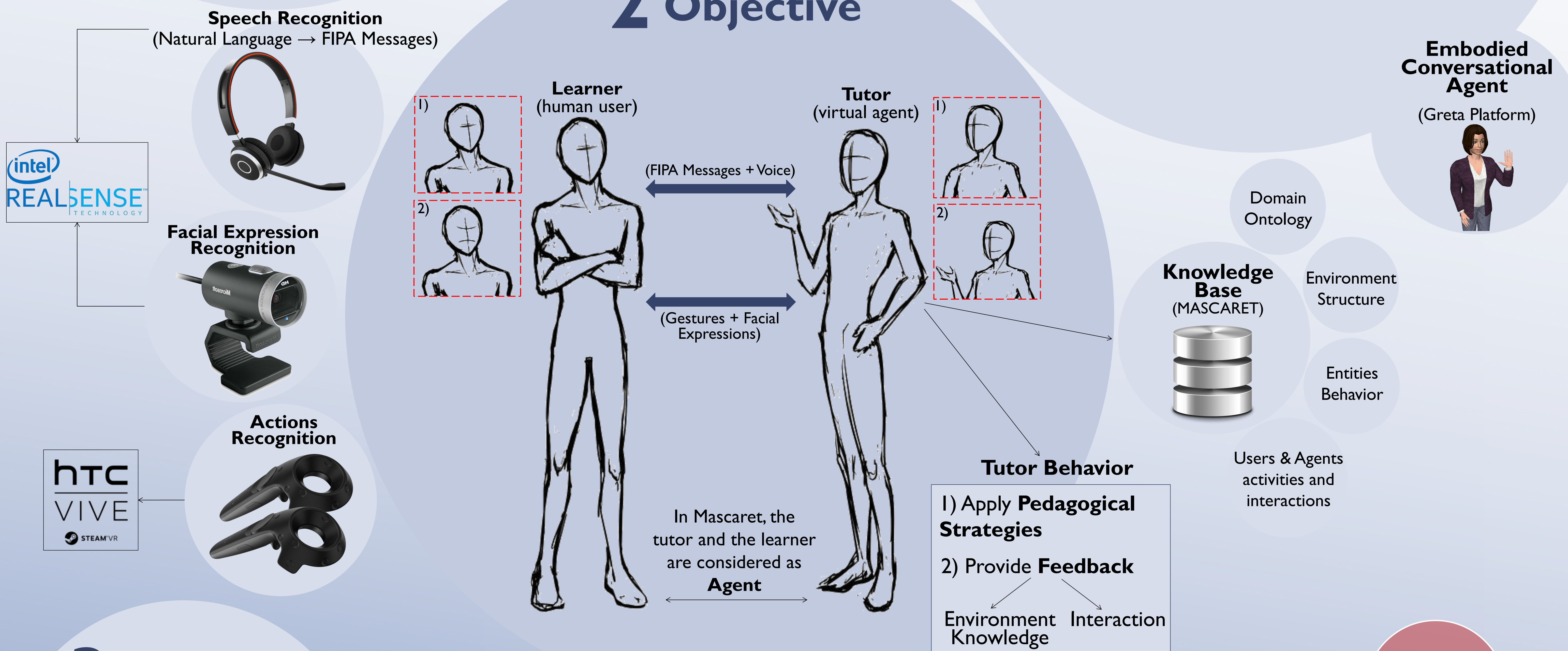
## 4 Application

**Informed Virtual Environment** for procedural learning for blood analysis

- Actions of the automaton
- Actions of the reagents preparation



## 2 Objective



## 3 Evaluation Methods

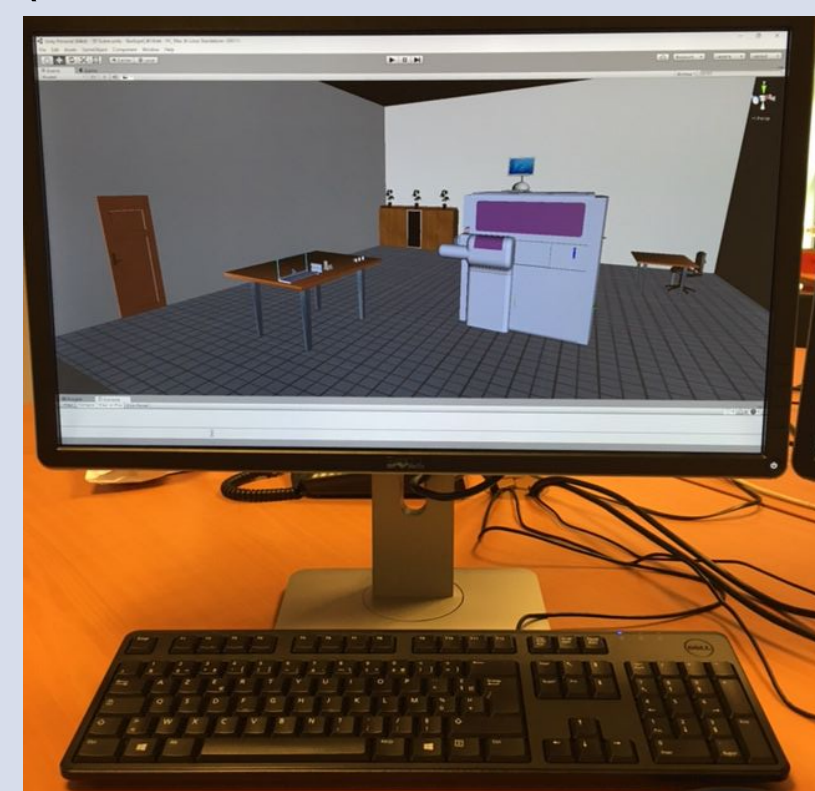
**Subjective Questionnaire vs. Objective Performance Measures (OPM)**

Hoareau's Experimental Protocol:

Interest of VR for learning, based on OPM.  
Execution time, consulting assistance, number of errors, etc.

**Hoareau's Experiment**

(Non-immersive VR devices):



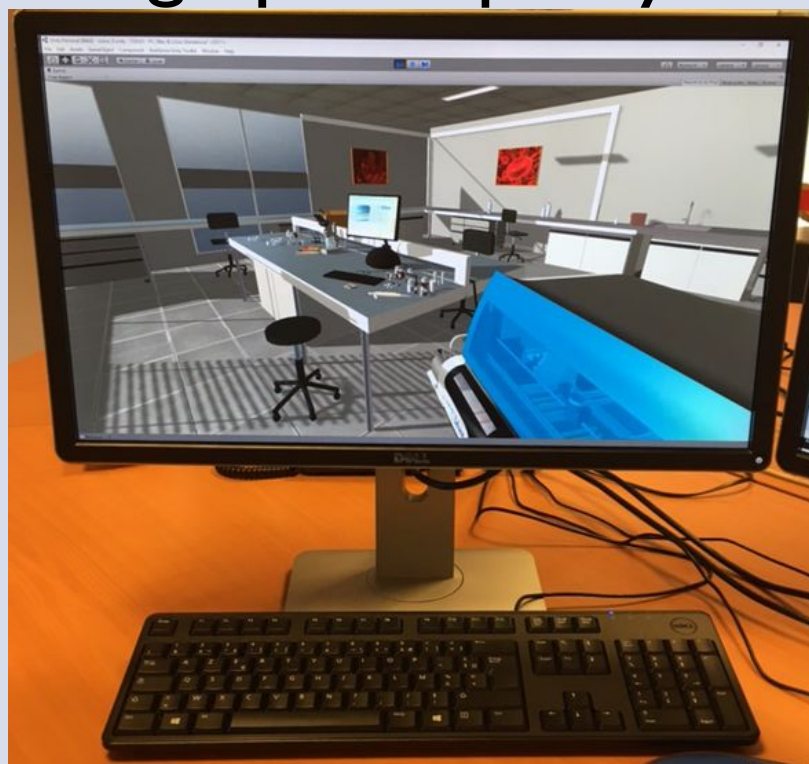
**First Experiment**

(Different immersion level):

CAVE



PC with good graphics quality



VR head mounted display



**Final Experiment:**

Integration of a virtual agent with a cognitive feedback behavior.



## 5 Conclusion & Perspective

In order to demonstrate the genericity of our model, we also plan to apply this work in the **Cultural Heritage Domain**.

The proposed model will perform agent behavior having knowledge not only about learning but also on a social-cultural heritage, such as the ancient bridge of Brest. Agents will be able to participate in activities and interact in a natural way with visitors.