



## MASTER RESEARCH INTERNSHIP



## BIBLIOGRAPHIC REPORT

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# Sailor vs Poseidon: Enhancing Training Simulation in 3D Collaborative Virtual Environments

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**Domain : Technology for Human Learning, Human-Computer Interaction**

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## Abstract

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# **1 Introduction**

Here start your document - Should be 15 pages long

Please do not hesitate to have a look at the bibliographic report included in this archive

## **2 State of the art**

Yet 7 pages ! For each subsection, make a synthesis of the indicated set of papers. General remark:

### **2.1 Awareness**

Communication and awareness.

#### **2.1.1 Executor: awareness of his own actions**

Exchange of avatars.

#### **2.1.2 Awareness of a third person actions**

Show-Through techniques. Exchange of avatars.

### **2.2 Cooperation**

3-Hand manipulation.

#### **2.2.1 Particular case: using the VE as an informative support**

Communication and awareness (written communication).

### **2.3 Social invasive aspects**

#### **2.3.1 Physical actor**

Show-Through techniques (social protocols).

#### **2.3.2 Intrusive metaphors**

Intrusive hand and metaphors, to be controlled

### **2.4 Scenario design**

# SEVEN.

## **3 Goals**

The user will have to achieve a set of tasks. They will be the pretext for testing different aspects of the coach presence and actions. What we want to evaluate through the tests are in general the global execution performance of the trainee and to what degree the ways the coach presence is represented are pleasant or at the contrary disturbing.

**Directives** In order to tell to the user what is his next task, the coach will have to communicate with him. Three communication modes will be evaluated:

1. oral communication;
2. instructions written or drawn on a virtual support object (e.g, a board or a tablet);
3. instructions written or drawn in a virtual menu that the user can open as a popup.

The goal here is to evaluate the correlation between the execution time and performance and the communication way used.

**Invasive aspects** The potentially social invasive metaphors have to be evaluated. To achieve this goal, a use case will be the coach demonstration step necessary for complex tasks. Four ways will be evaluated:

1. the coach takes-over the trainee avatar, who can only see what happens but can't interact any more;
2. the coach uses his own avatar;
3. the coach uses his own avatar but only the interacting body parts are visible (typically the hands);
4. The coach uses his own avatar but is not visible at all, however his contact points with the handled objects are highlighted (e.g, as red spots).

Through this type of tests, we want to evaluate the degree of annoyance of the used metaphors.

**Collaboration** Some collaborative tasks can be a support for the evaluation of their efficiency and execution time with respect to the way the coach is represented. Three metaphors can be evaluated:

1. the avatar of the coach is visible;
2. only the interacting body parts are visible;
3. the coach is invisible but his contact points with the handled objects are highlighted.

**Awareness of the coach presence and power** During the dead times, it can be interesting to evaluate the trainee perception of the coach actions on the VE. Two types of coach actions must be considered:

1. the coach interacts with an object of the VE, e.g he changes the position of an object;
2. the coach changes the parameters of the application, e.g he changes the weather conditions.

For the first type of actions, The same metaphors than for the collaboration tasks can be used. For the second type, four metaphors can be evaluated:

1. The coach avatar casts a spell using a specific gesture and voice control. Such a multimodal command can be real, i.e the coach has to perform it in order to make a parameter change, or just a metaphor, i.e the coach doesn't perform it but his avatar moves and speaks automatically.
2. A 3D animation is performed by the system. For example, a grey cloud can appear and move through the scene in order to indicate that the weather is now rainy.
3. A popup indicating the change is displayed.
4. No indication at all.

Several perception aspects can be evaluated thanks to these tests: the annoyance and pleasant degrees and the execution time (some metaphors can capture the attention of the trainee for a quite long time).

## 4 Conclusion