

**LERU STudent REseArch Mobility Programme (STREAM)  
Project proposal**



**Host University:**  
Università degli studi di Milano



**Field:**  
Information and Communication Technologies

**Specified field, subject:**  
Virtual reality, ICT

**Research project title:**  
Visualization and Interaction for Real and Virtual Reality Environments



Possible starting month(s):

Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
x	x	x	x	x	x	x	x	x	x	x	



Possible duration in months:

1	2	3	4	5	6
				x	x



**Suitable for students in:**  
2<sup>nd</sup> cycle (Master students)

**Prerequisites:**  
For both project aspects: programming skills in any language  
Additional for the first project aspect: C, C# or Python intermediate programming skills



**Restrictions:**  
none



**Description:**  
Visualization and interaction in real and virtual reality environments constitute a growing area of research and application, in a variety of fields encompassing health care, entertainment, and remote realistic interactions.

This project addresses the following two areas, among which the student can choose his/her preferred topic for the research stage:

ASPECT 1) Interaction is an essential aspect in many ICT platforms for autonomous rehabilitation and monitoring, in a variety of environments, including remote solutions at home.

The design and development of therapeutic games has been one of the pillars.

Within this area, the student will be able to choose one or more of the following aspects to be investigated:

- The first aspect consists of studying and experimenting the introduction of everyday-use objects inside the ICT rehabilitation and monitoring platform developed at the Department of Computer Science. In particular, micro-architectures to be embedded into toys for children rehabilitation have been



recently developed: their use will be extended into functional objects (e.g. forks, cutters...).

- The second aspect consists of exploring smart tiles and insoles to assess posture and gait stability. In this framework a first research aspect is to derive quantitative evaluation indexes of gait / posture through objects (tiles and insoles) and compare these indexes with results known in motion analysis. In a second research aspect we will exploit exer-games used in conjunction with sensorized objects that work both as trackers and data capture.

The specific supervisor of this research aspect is prof. Alberto Borghese (alberto.borghese@unimi.it).

ASPECT 2) Stereoscopic visualization is growing in all the fields of research and application, from entertainment to the medical field, thanks to the new hardware solutions and software development.

Aim of this study is to analyze the efficacy of 2D Vs 3D visualization, in terms of depth perception as well as other parameters (i.e. visual fatigue, sense of immersivity, pleasantness etc.). **Blended mobility (i.e. a combination of physical and virtual mobility) is an option to be agreed with the Tutor.**

### **Faculty or Department**

Department of Computer Science - Università degli Studi di Milano

### **Contact person:**

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### **Contact email:**

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