

VP SUMMER SCHOOL - 2009

Department of Mechanical Engineering, Politecnico di Milano, 07th-10th July 2009

Objectives of the school

Virtual Reality technologies have become a topic of interest both in the industrial and academic worlds in recent years. The process of product development benefits from these technologies through the use of so-called **virtual prototypes**. Virtual Prototypes have generated interest because they reduce the time-to-market and are less expensive than the traditional physical prototypes. The world of entertainment has also recently begun to use and develop these technologies in their applications. This has resulted in the development of a number of highly technological devices which are distributed at prices lower than the traditional products oriented to the research world. This leads us to imagine that such technologies will also be introduced to the industrial world in the near future.

The **aim** of this summer school, organized under the aegis of **S.S.D. ING-IND/15 (Design and Methods for Industrial Engineering)** is to create a contact and discussion point for researchers and Ph.D. students interested in Virtual Reality techniques and technologies and their exploitation for the creation of Virtual Prototypes, largely used in the product development process.

The school will focus on these topics:

- evolution of VR technologies in years
- computer vision
- input/output technologies
- cognitive psychology
- industrial experiences

Modality

The summer school will be held in the laboratory of Virtual Prototyping of the Department of Mechanical Engineering of Politecnico di Milano from 7th to 10th July. In order to take into account the time necessary for the transfer, the school will begin in the afternoon of the 7th of July and will end at the end of the morning of the 10th of July. The students that will arrive in the morning of the 7th of July will be invited to visit the labs of the research group of Virtual Prototyping.

The school will host seminars by Italian and foreign researchers experts in the disciplines of computer vision, virtual and augmented reality technology, cognitive psychology and haptic interaction. In addition, professionals from the world industry will be invited to talk about the use of these technologies in their areas.

The school will address some issues concerning the use of virtual prototypes from both the theoretical and practical point of view: theoretical aspects of the disciplines will be addressed through presentations made by expert researchers in the field, practical issues will be handled in the laboratory through workshops, with the aim of providing a basic knowledge on tools and technologies for building applications for virtual prototyping. The workshop will further aim to provide a starting point for discussion and informal meeting between experienced researchers and students of the school.

The maximum number of students admitted to VP Summer School is 25.

The participation fee is set at € 300 and includes lunches, coffee breaks, dinner and educational materials. It will be also included a list of hotels with special prices for participants. Participation is by registration sent via e-mail to the local organizer, Francesco Ferrise (francesco.ferrise@polimi.it).

Program

Day 1 (7th July)

Morning

- **11:30** Welcome and visit to the Laboratories
- **13:00 Lunch**

Afternoon

- **14:30** Introduction (Monica Bordegoni, Politecnico di Milano)
- **15:30** Computer Vision and Image Processing (Giovanni Gallo, Università di Catania)
- **17:30 end of the day**

Day 2 (8th July)

Morning

- **09:00** Evolution of the techniques of digital representation: from Computer Graphics to Virtual Prototyping (Umberto Cugini - Politecnico di Milano)
- **10:00** Mixed Reality for industrial application (André Stork, IGD - Fraunhofer)
- **11:30 Coffee Break**
- **12:00** Mixed Reality issues, solutions and challenges (Antonello Uva, Politecnico di Bari)
- **13:00 Lunch**

Afternoon

- **14:30** Demo VirTools - example of the creation of a VR application (Fabio Bruno, Università della Calabria)
- **16:30** *Workshop and discussion*
- **17:30 end of the day**

Day 3 (9th July)

Morning

- **09:00** The sense of touch (Gabriel Baud-Bovy, U.H. San Raffaele)
- **10:30 Coffee Break**
- **11:00** Haptic devices and illusions (Vincent Hayward – ISIR - Paris)
- **13:00 Lunch**

Afternoon

- **14:30** Demo on the creation of a haptic application (Francesco Ferrise, Politecnico di Milano)
- **16:30** *Workshop and discussion*
- **17:30 end of the day**

20:30 Social Dinner (see next page for details)

