Title (tentative): Obstacle Avoidance Method In Real Space For Virtual Reality Immersion

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**Description**

**Motivation and application domain**

Typical Head-Mounted Displays (HMDs) that provide a highly immersive Virtual Reality (VR) experience make any interaction between a user and real space difficult by occluding the user's entire field of view. The existing method of supporting interactions with the real space is superimposition of boundary lines of the real space on the virtual space in the HMD. However, overlaying the boundary lines on the entire field of view may reduce the user's immersive feeling.

**General objectives and main activities**

The main goal of this thesis is to develop an immersive VR system that implement an ecological obstacle avoidance technique. Objects in a room will be detected, and their approximate shape and position recovered (e.g. by using RGBD sensors). The VR scene will be enriched with objects having the same shape and position of real ones. Experimental sessions will be performed to validate the system and to compare it with existing techniques in the state of the art.

**Training Objectives (technical/analytical tools, experimental methodologies)**

1) To analyze the state of the art in the field of obstacle avoidance in immersive VR.
2) To implement some existing techniques in order to build a reference for further comparisons.
3) To devise a novel obstacle avoidance technique
4) To validate the new technique with respect to the state of the art.

**Place(s) where the thesis work will be carried out:** DIBRIS – Valletta Puggia Via Dodecaneso 35

**Additional information**

**Maximum number of students:** 2