Title (tentative): Human Perception in Immersive Virtual Reality

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Motivation and application domain

Since the launch of the first prototype of the Oculus Rift, Virtual Reality headsets have become ever more popular and the attention from the public has grown exponentially. Though a big effort has been spent in order to create new experiences for users, who are fascinated by the novelty of such new devices, at the moment relatively little research has been done in order to quantitatively evaluate human perception in VR and AR devices, in particular VR headsets, such as the Oculus Rift.

General objectives and main activities

The main objective of this thesis proposal is to start from standard basic psychophysics techniques, in particular by addressing approaches that have been previously used to analyze visual perception across all the field of view, and to adapt them in order to characterize the perception within the virtual reality headsets’ field of view. The main activities of the thesis will be the following: (i) study of the state-of-the-art in psychophysics evaluation of scene perception; (ii) development of a set of experiments, by taking into account the specific features of immersive environments, to be performed into immersive VR; (iii) experimental sessions to characterize scene perception in immersive VR.

Training Objectives (technical/analytical tools, experimental methodologies)

- Analysis of the state-of-the-art in psychophysics technique to study visual perception across the visual field
- Development of a set of innovative experiments to be carried out into immersive VR (e.g. depth perception, self-motion, multisensory,…)
- Implementation and testing by using an immersive VR device (e.g. Oculus Rift, Samsung Gear VR)

Place(s) where the thesis work will be carried out: DIBRIS

Pre-requisite abilities/skills: Object oriented programming (C++ or C#), interest in psychophysics and experimental evaluation

Maximum number of students: 2