

## **Learning to listen through another person's ears: a study of learning curves using non-individualised Head-Related Transfer Functions**

Santos, J.A.<sup>1</sup>, Mendonça, C.<sup>1</sup>, Murteira, C.<sup>1</sup>, Ferreira, J.P.<sup>2</sup>, Dias, P.<sup>3</sup>, Campos, G.<sup>3</sup>

<sup>1</sup>Departamento de Psicologia, Universidade do Minho, Portugal

<sup>2</sup>Centro de Território Ambiente e Construção, Universidade do Minho, Portugal

<sup>3</sup>Departamento de Electrónica, Telecomunicações e Informática / IEETA, Universidade de Aveiro, Portugal

Virtual Reality (VR) environments traditionally aim at visual immersion, but the development of convincing VR simulations requires that other senses also be considered. Aural immersion, or *auralisation*, is the natural next step in the evolution of VR systems.

Auralisation relies on anechoic sound source recordings processed to mimic the influence of the acoustic propagation environment (absorption, reflections, reverberation). The listener's head, pinna and torso have a crucial effect which can be described by Head-Related Transfer Functions (HRTF), different for each individual.

Earphone presentation makes it possible to auralise sounds processed using HRTF other than the listener's own. In our study we used non-individualised HRFT, obtained from mannequins equipped with ear microphones.

Subjects were asked to indicate the perceived source position for sounds processed to simulate different azimuth angles: from 0° (front) to 90° (right). Several sessions were carried out for each participant. The goal was to find how their localisation accuracy varied over time, as it was hypothesised that exposure would induce a learning effect.

Preliminary data indicate that 3D localisation does indeed improve with exposure but the learning curves evidence a *plateau* effect, beyond which further exposure does not lead to additional improvement.

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