

Christos Giachritsis

Research Fellow

Tel: +44 (0)121 414 2870

Fax: +44 (0)121 414 4897

Email: c.giachritsis@bham.ac.uk (<mailto:c.giachritsis@bham.ac.uk>)



I am interested in the way we integrate spatio-temporal sensory information to perceive physical properties and events (e.g., time-to-contact, shape, weight, object displacement) through vision and touch. In principle, integration of sensory information could take place intra-modally (within a single channel or among different channels of the same modality) or inter-modally (among different modalities). The aim of this research is to understand what spatio-temporal information is collected through senses and how it is processed in order to build a useful representation of the world. In addition to the theoretical contribution of this approach there are also practical benefits. For example, knowing what type of information and how it is processed by the CNS to give rise to a robust percept could be very useful when designing VR systems. A well designed VR system should focus on simulating information that is important to the sensory system itself rather than trying to simulate precisely every aspect of the physical world, which could potentially result in great loss of system resources.

An example of intra-modal sensory integration is the perception of surface orientation with active touch, which involves integration of proprioceptive information from the elbow and shoulder joints. Psychophysical experiments, which took place in the SyMoN lab using the PHANToM® haptic interface, showed that longer surfaces result in more accurate orientation judgments. This suggests that the elbow-shoulder system may integrate redundant spatial information to perceive surface orientation.

My current work focuses on weight perception and is part of the IMMERSENCE integrated project (www.immersence.info (<http://www.immersence.info>)) which aims to enhance presence in VR and mixed environments. Given that we work under gravity, understanding how we perceive weight is very important in order to understand how we manipulate objects and plan our movements. Here, we investigate the effects of gravitational torques (acting on the shoulder joint) and the effects of bimanual lifting on weight perception. This research attempts to find out how weight information from different unimanual (e.g., grip and arm muscles) and bimanual channels (e.g., left and right hand grip) is integrated to judge weight.

Publications

Giachritsis, C.D. and Wing, A.M. (2007). Unimanual and bimanual weight judgments. EPS meeting, July, 83.

Giachritsis, C.D. and Wing, A.M. (2007). The effect of gravitational torques applied at shoulder joint on weight perception. EPS meeting, July, 84.

Giachritsis, C.D., Wing, A.M. and Lovell, P.G. (2006). The role of spatial integration in the perception of surface orientation with active touch. EPS meeting, April, 72.

Giachritsis, C.D. and Harris, M.G. (2005). Global versus local image expansion in estimating time-to-contact from complex optic flow. *Perception*, 34(5), 577-585.

Harris, M.G. and Giachritsis, C.D. (2000). Coarse-grained information dominates fine-grained information in judgments of time-to-contact from retinal flow. *Vision Research*, 40, 601-611.