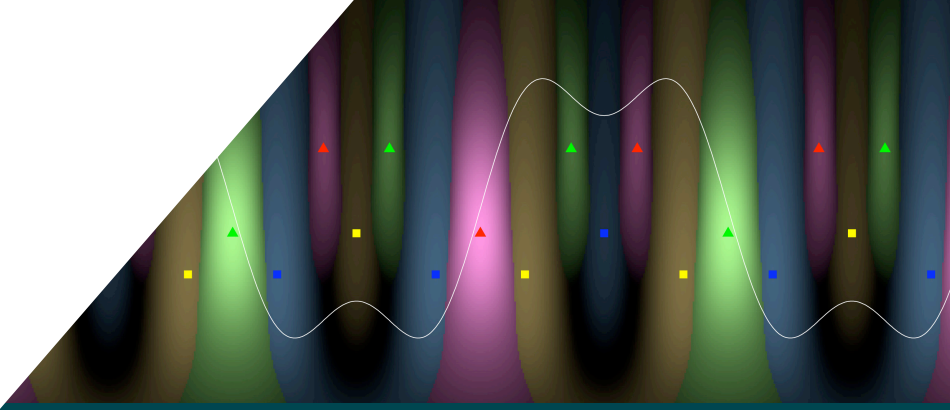
Aston University
Life & Health Sciences



Rigorous, Relevant
Research

Sensory & Perceptual Systems

Introduction

The Sensory & Perceptual Systems (SPS) research group presently has 7 members of academic staff, including 3 professors, along with 5 research fellows and 3 research students. We investigate human sensory systems and human perception, especially the major communicative senses of vision and hearing - how they work, and how they sometimes go wrong. We do this through computer-controlled psychophysical experiments, computational modelling, theoretical analysis, and brain imaging techniques (MEG & fMRI). We also apply this knowledge to clinical aspects of human perception, including the restoration of hearing through cochlear implants and the surprising role of noise in improving performance. A second major strand of our hearing research is the study of the perceptual organization of sounds, including speech perception and auditory 'streaming' phenomena.

In vision, one major theme is the study of fundamental processes that encode the spatial and temporal structure of the retinal image, leading to a description of image features, 3-D surfaces and movement. Current projects here focus on spatial vision, binocular vision and depth perception, and this research has strong links to work in computer vision and in the neuroscience of vision. Other projects are studying the role of attention in vision, and the development of object recognition in children. Such understanding can help to explain both normal and abnormal vision, to unravel the puzzles of illusions and after effects, and has application in diverse fields from display design and computer graphics to medical imaging and ophthalmology.

Sponsors and funders

- EPSRC
- BBSRC
- ESRC

Members of the SPS group also collaborate and publish joint research with other laboratories in the UK, Europe, USA, Canada and Japan.

Current projects

Martin Jüttner: ESRC. 2007- 2010. The Development of Object Recognition into Adolescence. Value: £211,000. Supports 1 postdoc at Aston. With: Prof J. Davidoff, Goldsmiths College, London.

Brian Roberts: EPSRC. 2008-2011. The perceptual organization of speech: Contributions of general and speech-specific factors. Value: £374,220. Supports 1 postdoc + 1 PhD student. With: P. J. Bailey, University of York.

Tim Meese & Mark Georgeson: EPSRC. 2009-2013. The Spatial Integration and Segmentation of Luminance Contrast in Human Spatial Vision. Value: £648,000. Supports 2 postdocs + 2 PhD students.

Mark Georgeson & Tim Meese: BBSRC. 2009-2012. A multi-scale model of binocular fusion in the human visual system. Value: £354,000. Supports 1 postdoc.

Robert Morse: EPSRC: 2009-2012. The use of enhanced neural response imaging to get better cochlear implant fitting for children and adults. Value: £391,000. With: Prof Nigel Stocks (Warwick University).

Link to group web page

www.aston.ac.uk/lhs/research/neurosciences/sps

Key contact

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Above Illustration: scale-space analysis of the visible features in images