

Modelling Selective Attention

COMMSP Workshop

Room 611, 14:00 Hrs Tuesday 3 July.

Electrical Engineering Department, Imperial College.

Email: d.mandic@imperial.ac.uk

INTRODUCTION: 14:00-14:15

Speaker: Prof Anthony G. Constantinides (Imperial)

Title: **The role of humans in the communications chain: From Gabor and Cherry to stochastic complexity**

FIRST TALK: 14:15-14:45

Speaker: Dr Preben Kidmose (Aarhus University, Denmark) and Prof Danilo Mandic (Imperial)

Title: **Listen to the brain: From stimulus to human response**

Abstract: To illuminate human response to stimuli, we present the electrophysiological basis for brain responses to sound, from the auditory pathway to on-scalp electrical responses (EEG). What do these responses represent? What is the information that they carry and how are they influenced by attention? We discuss challenges in generating (experiment design) and detecting (signal processing) these responses, and highlight some next generation solutions in wearable EEG devices.

SECOND TALK: 14:45-15:15

Speaker: Dr David Looney (Imperial) and Dr Preben Kidmose (Aarhus University, Denmark)

Title: **Auditory Yabus: Closing the loop between stimulus and response**

Abstract: We examine brain electrical responses (EEG) in a complex acoustical environment of music and speech. By operating within an experiment setting based on the classic 'visual Yabus study', we can study with great rigour the underlying mechanisms responsible for auditory selective attention. The findings have great appeal in human-machine interaction, and the future design of hearing instruments.

THIRD TALK: 15:30-16:00

Speaker: Dr Michael J. Proulx (Queen Mary, University of London)

Title: **Seeing with your ears: Attention with sensory substitution**

Abstract: Investigations of auditory, visual and multisensory attention benefit from the study of both sensory substitution and deprivation, which in turn will further the understanding of perceptual learning in general and the reverse hierarchy theory in particular. They also have significant importance for the understanding of the brain in metamodal terms, where functional brain areas might be best defined by the computations they carry out rather than by their sensory-specific processing role.

FOURTH TALK: 16:00-16:30

Speaker: Prof Aaron Williamon (Royal College of Music)

Title: **The art and science of expert memory and attention**

Abstract: Exceptional memory is a hallmark of expertise, and a number of theories have been proposed to explain how experts are able to achieve prodigious feats of memory in performance. This presentation will explore the behavioural and neural correlates of expert musical memory and, specifically, how pianists develop and exploit cues for encoding and retrieving a complex semantic structure. Implications of the results for existing theories of expert memory and music cognition will be discussed.