

# The Second Workshop and Lecture Series on: “Cognitive neuroscience of auditory and cross-modal perception”

20 – 24 APRIL 2015, KOŠICE, SLOVAKIA

## Program and abstracts book



## Objectives

- This workshop and lecture series will include introductory lectures and advanced research talks on a range of topics related to the **neural processes of auditory, visual and cross-modal perception**.
- The talks will illustrate the **multidisciplinary character of cognitive neuroscience research**, covering behavioral, neuroimaging, and modeling approaches, as well as applications of the research in auditory prosthetic devices.
- The workshop is aimed at **early-stage and advanced students and young researchers**, and it will provide ample opportunities for direct interactions between the lecturers and the attendees.

## Themes

Spatial hearing, vision and crossmodal perception, neural modeling, methods in cognitive neuroscience: behavioral experiments, EEG and fMRI imaging, modeling, applications: cochlear implants, hearing aids.

## Format

Lectures 20 – 22 April, Consultations 23 – 24 April

## Venue

[Historicka aula, P. J. Safarik University, Srobarova 2, 040 11 Kosice, Slovakia](#)

## Organizers

Norbert Kopco, PhD. ([norbert.kopco@upjs.sk](mailto:norbert.kopco@upjs.sk))

Frederick Gallun, PhD. ([Frederick.Gallun@va.gov](mailto:Frederick.Gallun@va.gov))

## Organizing team and contact

Beata Tomoriova, Lubos Hladek, [Perception and Cognition Lab](#), [kogneuro@gmail.com](mailto:kogneuro@gmail.com)

## Plenary lecture and panel discussion

**Virginia Best, Frederick Gallun, and Norbert Kopco**

Audibility and spatial hearing

Wednesday, 22 April 17:30-19:00 ([Uhorsky dvor restaurant](#), [directions](#))

attention in the congruent direction to the evoked shift in visual attention. Furthermore, if the auditory attention shift is congruent to the visual attention shift, the visual processing of saccades is delayed. This delay is more pronounced if the attention is shifted to the right. These differences do not take place if the presentation of both modality cues is asynchronous. The results are discussed with respect to hemispheric asymmetry.

This study was supported by VEGA Grant No. 1/0083/15

## Prediction processes in the visual modality – an EEG study

Gábor Csifcsák, Viktória Balla, Szilvia Szalóki, Tünde Kilencz, Vera Dalos

The ability to feel agency has been associated with internal forward modeling. This phenomenon is considered to rely primarily on sensory predictions, and have been increasingly investigated in the auditory modality. Only a few studies were using visual stimuli, none of them focused on stimuli relevant in social interactions. Our aim was to examine prediction-related modification of visual processing by analyzing ERPs elicited by images of hands. Twenty-three adults participated in our experiment. In the ACTIVE condition, predictable stimuli appeared after the participants pressed a button with either right or left hand while in the PASSIVE condition, they were only observing the images. In a predominantly right-handed group, an amplitude decrease over the occipital cortex was observed in the early, 80-120 ms post-stimulus time interval, (i.e. around the visual N1 component) in the ACTIVE vs. PASSIVE condition much stronger for movements made by the dominant hand. We found that dominant hand stimuli and stimuli shown in the visual field of the dominant side evoke greater neural activity. Considering that these effects appear very early, it can be assumed that the modulation of the activity of the striatal/extrastriatal visual cortex contributes to the feeling of agency connected to hand movements.

## Early electrophysiological correlates of susceptibility to the double-flash illusion

Simon Júlia, Csifcsák Gábor

Institute of Psychology University of Szeged

A double-flash illusion can occur when a single flash of light is accompanied by two brief auditory stimuli leading to the perception of two flashes. Although susceptibility to this illusion shows great inter-individual variability, which might even be used to differentiate between certain special conditions, reliable experimental protocol for its measurement are still needed. To this end, we recorded electroencephalography (EEG) in 17 participants in order to identify early neural responses, which are less influenced by decisional strategies. Two types of illusory conditions with different inter-sound intervals were used: 67 ms (short condition, SC) and 133 ms (long condition, LC). The strength of the illusion was 75% and 43% in SC and LC, respectively. In line with previous results, moderate to strong correlations between behavioural data and EEG difference waveforms amplitudes were observed in the early 120-140 ms post-stimulus interval. We also found another EEG marker peaking at 30 ms, presumably reflecting stimulus expectancy. In conclusion, we can say, that our experimental protocol is a good candidate for further examination of the relevant factors influencing the susceptibility of this illusion.

## Suggestion of rehabilitative treatment for patients subjected to sight restorative surgery.

Olena Markaryan

Independent researcher

Studies of patients who underwent the visual restoring surgery do not give encouraging results. Particularly, Dormal et al. (2014) recently informed that although the post-surgical improvement of