

London 18th November, 2004

Dear Sir/Madam,

I am writing to you regarding the recently advertised faculty posts at the Biocomplexity Institute. My interest in the post is motivated by my belief that teaching and research represent complementary and mutually reinforcing aspects of an academic career. I hope to contribute to the high standing of the Institute by pursuing excellence on both these fronts.

Research

During the course of my postgraduate study, I was able to develop three broadly related lines of research, which I am currently pursuing. I have formed close and extensive contacts with researchers abroad as well as in Great Britain and intend to convert these into collaborative projects. The prizes I have received for my research thus far testify to my commitment to high quality scientific work.

The first topic I have been involved with is research on temporal mechanisms of harmonic integration, which represents the basis for my doctoral thesis. The research focuses on the role of stimulus-induced gamma-band oscillations in the perceptual integration of spectral components of harmonic complex tones. The principal issue addressed in the thesis is whether external periodic stimulation can reveal information about hypothesised temporal mechanisms involved in the "binding" of harmonic components through application of a reaction-time (RT) paradigm. The main finding is a RT advantage for inharmonic targets (targets that are not harmonically related to the entraining stimulus) when the stimuli are presented at 33 Hz. Some of the principal findings have been reported in the Proceedings of the 18th Annual Conference of the International Society for Psychophysics, and a major paper describing the results and the psychophysical model in detail is awaiting submission. Previously, the research was presented at the International Symposium on Neural Binding of Time and Space (Leipzig 2000), the Third International Conference on Cognitive Science (Beijing, 2001) and The Seventeenth Annual Meeting of the International Society for Psychophysics (Leipzig, 2001). Several opportunities for taking the research further have arisen recently. To illustrate, a grant proposal is currently being prepared with the aim of investigating temporal auditory processing in children with Specific Language Impairment (SLI). This involves combining my psychophysical paradigm with the auditory EEG at the Institute of Laryngology and Otology, University College London, with Professor Deepak Prasher as the co-author. In addition, a joint grant proposal is being planned with Dr Mark Elliott (Munich), Dr Raul Kompass (Leipzig) as co-authors. The aim of the initiative will be to address the general question of temporal mechanisms in visual, auditory and cross-modal contexts using psychophysical and electrophysiological paradigms.

My auditory research led me to consider the general issue of the dynamics of perceptual organisation. This has resulted in a published article (Aksentijevic, Elliott & Barber, 2001) as well as a successful research visit to the Laboratory of Cognitive Science in Beijing in 2002. There, I conducted visual experiments, which investigated a field theory of grouping outlined in the paper. I had the opportunity to present the results to the staff and students of the laboratory on two occasions. Currently, I am writing a paper summarising the findings of these experiments. In addition, one of the final-year psychology students at the School of Psychology, Birkbeck, chose this research as a topic for her experimental project. Recently, I have discussed the implementation of the theory to the issue of auditory-visual interactions with Dr Bruno Repp of Haskins Labs (USA), and have constructed a preliminary proposal for further work.

One of the practical consequences of this research has been a measure of structural complexity, which provides a novel and general method of studying different types of structure, and which provides a direct link between psychology, physics and computer science. I have presented the results of this (collaborative) work to the national and international audiences on several occasions (see the attached CV) and it will form the basis for a research project proposal. The results of my research have been published and another paper, investigating the complexity of genetic sequences awaits submission.

Teaching

My commitment to teaching is reflected in the fact that in parallel with my postgraduate study, I have worked as a lecturer in research methods and statistics at MSc level in three prestigious institutions (details are available in the accompanying CV). I have designed courses, constructed and marked examination papers, advised students on their empirical projects and performed a variety of administrative tasks. In addition, I have acted as a demonstrator and teaching assistant for all four years of the Birkbeck BSc Psychology course, seminar group leader and final-year project supervisor and marked over one hundred laboratory reports and essays. I have also lectured on perception, psychophysics and neurophysiology.

Finally, I wish to emphasise my commitment to the aims of the Institute, and impress upon you the enthusiasm with which I would approach the challenge of working at the Institute.

Sincerely Yours,

Aleksandar Aksentijević