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Search Committee for
Assistant Professor in
Computational Neuroscience
Brown University

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Dear Search Committee,

I am writing to highly recommend Dr. Vassilis Cutsuridis for the position of Assistant Professor in Computational Neuroscience at Brown University. Dr. Cutsuridis has excellent credentials for this position.

In the course of his career, Dr. Vassilis Cutsuridis has published an impressive range of papers on computational modeling projects addressing the function of a range of different brain structures. In particular, I was impressed by the work he performed with me as a post-doctoral fellow. During his work here at Boston University, he completed an insightful model of local circuits in hippocampl region CA1 that accounts for the spike timing of different subtypes of hippocampal interneurons relative to the network theta rhythm oscillations in hippocampus. This work was published in the journal *Hippocampus* (Cutsuridis and Hasselmo, 2012). This exciting work addresses the circuit dynamics underlying the important experimental findings of Thomas Klausberger on the spike timing of different identified classes of hippocampal neurons. This provides an impressive link between physiological data at a cellular, biophysical level and experimental data on circuit dynamics in the intact brain from the Klausberger laboratory as well as other laboratories. This research puts Vassilis at the forefront of computational research addressing the role of interneurons in the function of hippocampal subregions. This is an important area for computational neuroscience, because experimental studies have demonstrated a wide variety of physiological properties and connectivity patterns of different classes of interneurons, but modeling is necessary to understand the functional role of these differences in interneuron properties. During his work in my laboratory, Dr. Cutsuridis also published other important papers, including insightful work on the modulation of spike-timing dependent plasticity in hippocampal region CA1 (Cutsuridis, 2011). Along with his other research projects, this work provides an outstanding basis for starting out as an Assistant Professor of Computational Neuroscience at Brown University.

As further evidence of his leadership role in this field, Vassilis recently published an important, comprehensive book on *Hippocampal Microcircuits: A Computational Modeler's Resource Book*. He is the first editor on this volume that gathers together contributions from a range of influential researchers in the field. I was impressed by his book, and I published a review extolling its virtues in Frontiers in Systems Neuroscience. The book provides an

outstanding resource for researchers interested in modeling the function of individual subregions of the hippocampal formation, drawing together outstanding articles on the modeling of intrinsic properties, synaptic modification mechanisms and network interactions. By producing this book, Vassilis has further demonstrated his status as an important contributor to research on computational neuroscience.

The recent work by Dr. Cutsuridis builds upon earlier work published in *Hippocampus* (Cutsuridis et al., 2010) in which he presents modeling of the dynamics of encoding and retrieval within the hippocampal formation, using a detailed network biophysical simulation that includes a range of different interneuron subtypes. The work in that paper was performed while Vassilis was in the Department of Computing Science and Mathematics at the University of Stirling working with Bruce Graham. I am pleased that I was able to recruit him into my own laboratory to continue this research that is closely related to my own work on dynamics of encoding and retrieval during different phases of theta rhythm oscillations.

Vassilis has also published other important studies on other neural systems. This work includes modeling the properties of decision making and reaction times in human data on eye movement tasks (Cutsuridis, 2010; Cutsuridis et al., 2007). Vassilis demonstrated that he could effectively model the experimental data based on competition between inputs from the frontal eye fields (FEF) and the lateral intraparietal cortex (LIP) to the superior colliculus. This further demonstrates his skills for linking detailed biological models to experimental data. He has also modeled the properties of bradykinesia in Parkinson's disease based on changes in the dopaminergic modulation of gain in cortical neurons (Cutsuridis and Perantonis, 2006), and extended this model to address the patterns of muscle contraction associated with cortico-spinal disruption in Parkinson's disease (Cutsuridis, 2011). I have rarely encountered young researchers with published work on such a wide range of different neural systems, and this demonstrates his excellent potential for research as an independent investigator. Vassilis has strong leadership skills and should be able to function effectively as an independent Assistant Professor pursuing a range of his research interests.

In summary, Vassilis has outstanding background for research in computational neuroscience. He has an excellent education and has clearly excelled in the publication of his computational research. As described above, he has published both excellent research publications and an outstanding edited volume on techniques for computational modeling of the hippocampal formation. He has demonstrated the strong self-motivation and incisive intelligence that will make him an excellent independent principal investigator.

Best regards,