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Professor David Sheinberg
Search Committee Chair
Department of Neuroscience, Brown University
Providence, RI

April 20, 2012

Dear Prof. Sheinberg,

I am delighted to write a letter in support of Dr. Wilson Truccolo's application for a position in Computational Neuroscience in your Department. I have known Wilson since he was a graduate student in the Center for Complex Systems at Florida Atlantic University, and he is one of my favorite young scientists. In particular, among his other research projects, Wilson was working on the identification of multiple evoked components and understanding of trial-to-trial variability of neuronal responses in cortex. At that time I developed a collaboration with him and his advisors to look at stochastic modeling of neural interactions and information flow across different cortical layers. We were applying these stochastic models to, among other things, the study of data from cortico-laminar microelectrode recordings (14-electrode linear array) in monkey V1 collected in my lab. Wilson's approach to modeling neural evoked responses in LFPs/EEGs based on differential Variability Component Analysis (dVCA; Truccolo et al., *Biol Cybern*, 2003) was demonstrated to be superior to, and with better interpretation properties than, independent component analysis (ICA) (Knuth, Truccolo et al., *J Neurophys*, 2006). In addition, Wilson's work on the nature of trial-to-trial variability and its effects on measures of statistical interdependence has proved very important for functional/effective connectivity and information flow analyses in neural systems (e.g. Truccolo et al., *Clin Neurophys*, 2002; Wang et al., *Neuroimage*, 2008: Estimating Granger causality after stimulus onset: a cautionary note).

I have continued to follow Wilson's scientific progress with interest since our early collaboration. In particular, I had the opportunity to follow his recent research in human epilepsy. In 2007, Wilson and I met at Columbia University, where together with a group of researchers from Brown, MGH and Columbia, we discussed potential collaborations in intra-cortical microelectrode array recordings in pre-resective epilepsy surgery monitoring. (I am part of the group at Columbia also developing the same approach.) More recently, Wilson has authored an important paper based on this approach (Truccolo et al., *Nature Neuroscience*, 2011), which has significantly advanced our understanding of epileptic seizures in people with intractable epilepsy and has provided a new path for seizure prediction, detection and control based on the spiking activity in ensembles of single neurons.

Wilson is also very well positioned to address challenges in understanding neural dynamics at multiple spatiotemporal scales. I expect that his expertise in stochastic modeling of neural signals ranging from multivariate neural point processes, to local field potentials, to ECoG and EEG, will allow him to productively approach the problem of collective dynamics (Truccolo et al., *Nature Neurosci*, 2010) within and across multiple spatiotemporal scales in intra and inter-areal cortical dynamics. I am confident in his capability to solidify an independent research career in Computational Neuroscience.

Columbia University Medical Center

He has a solid publication record and a prestigious NIH K01 career award. His NIH-NINDS R01 application as a principal investigator, expected to be funded in this funding cycle, is a further and strong acknowledgment of his progress in this direction. Because of all of the above reasons, I recommend Wilson's application with the highest possible enthusiasm, and without reservation. Please let me know if I can be of further help to you in making this decision.

Sincerely,

A handwritten signature in blue ink, appearing to read "Charles E. Schroeder".

Charles E. Schroeder, Ph.D.
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