

November 30, 2011

Dear Members of the Committee,

It is a pleasure to offer my recommendation of Dr. Zhe (Sage) Chen for a faculty position in your department. Sage has worked as a postdoctoral researcher in Emery Brown's laboratory in close collaboration with my laboratory developing the analytical methodologies for characterizing hippocampal and neocortical activity in the freely behaving rat as it relates to the formation and reactivation of spatial memory during awake and sleep states using multiple electrode recording techniques. Before coming to MIT, Sage received training in China and Japan on statistical and analytical methods applied to brain sciences including supervision by preeminent researchers at the RIKEN Brain Sciences institute such as Shun-ichi Amari. Given his background, Sage was able to quickly jump into a number of research projects in the department, including several in my laboratory.

Sage has proven to be an outstanding collaborator and has made significant contributions to our work involving the study of hippocampal memory encoding during active behavior, and reactivation during sleep and quiet wakefulness. His statistical background and concurrent work in the Brown lab analyzing human EEG and ECG signals, provided essential guidance in the development and application of methods for characterizing of slow wave sleep states in rodents (Chen et al., *Neural Computation*, 2009) that extend our efforts to understand the nature of hippocampal/neocortical memory processing during sleep and resting states. Sage is also an author on several manuscripts in preparation from our laboratory involving the development of a novel decoding methodologies that will have application in real-time neural feedback applications that Sage is interested in actively pursuing in his future work. These new approaches such as the use of a hidden-markov strategy that allows inference of the topological structure of hidden representations in complex neural time series which, for example, would allow decoding of activity during periods of sleep even in the absence of prior posterior response distribution estimates, reflects the clever, thoughtful, and often ingenious insights that Sage brings to the application of computational and statistical methods in neuroscience.

I have had a long term collaborative relationship with the Brown lab and have had the opportunity to work with a number of his very talented postdocs. Sage has been one of the most talented and engaged. He regularly participates in our lab meetings and activities, and provides valuable suggestions and insights on many projects. He is both

collaborative and independent and will thrive in an environment in which he has the opportunity to develop and apply methodologies in coordination with other investigators while at the same time defining and advancing his own research interests, much as Emery Brown has successfully done here at MIT and Harvard. He is friendly and interactive and would make a great colleague. His broad interest and experience in applied statistical methods makes him ideally suited to pursue the program that he has outlined in his research statement.

Overall, Sage is an exceptional candidate who will bring robust and rigorous statistical approaches to bear on exciting areas of basic and applied neuroscience and I recommend him enthusiastically.

Sincerely,

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