

April 23, 2012

To whom it may concern:

I am writing this letter to recommend Dr. Alberto Bernacchia for a position in your department. I've known Alberto for about 3 year now, since he joined the laboratory of Prof. Xiao-Jing Wang in the Department of Neurobiology at Yale University School of Medicine. In close collaboration with Prof. Wang, my laboratory studies the function of primate brain related to decision making, largely using electrophysiological methods in non-human primates. Alberto has been a key player in our collaboration with Prof. Wang during the last 3 years. Alberto has worked on multiple projects in Prof. Wang's laboratory, but my interaction with him centered on two projects related to the role of uncertainty in decision making and function of the primate anterior cingulate cortex.

Both of these projects are closely related, and attempt to gain insights into the question of how the brain adapts its decision-making strategies when the volatility or uncertainty of the animal's environment changes. There is always some uncertainty in the outcomes of our actions. However, when the environment is stable, it is not desirable to change the behavioral strategies whenever one encounters unexpected outcomes since this is likely due to noise, whereas in a more volatile environment, the same unpredictable outcomes may be a signal that the properties of the environment changed. Alberto has developed a neurobiologically plausible network model that can adjust its learning rates to adapt to the changes in the volatility of the environment. He has shown a great interest in our single-neuron recording data obtained in the anterior cingulate cortex (ACC) of monkeys performing stochastic decision-making tasks, and found that the pattern of activity of ACC neurons is similar to the behavior of randomly connected network that displays not just one, but many different time scales. This raised the possibility that the brain adapts to the changes in volatility by selecting an optimal time scale by re-weighting the activity of neurons in the ACC. These results were published in Nature Neuroscience last year, and I expect that it will have major impact in the field.

In both of these projects, Alberto came up with many original ideas and was willing to share them with his colleagues and open to discussions and suggestions. It is always pleasure to talk to him, and as a result he's a delightful colleague to have around. He is an excellent teacher, and gives very nice lectures. Thus, I recommend him strongly for a position in your department.

Sincerely,



Daeyeol Lee  
Associate Professor of  
Neurobiology, Psychology, and Cognitive Science