

April 27, 2012

Computational neuroscience search
Brown University

I am writing in support of the application of **Adrian Nestor** for a faculty position in your department. Adrian has been working as a postdoctoral fellow with me and Dr. Marlene Behrmann for about two and a half years. He came in with extremely strong technical skills and theoretical background from his Ph.D. work at Brown with Dr. Michael Tarr, and really hit the ground running. He has been highly productive during his time at CMU and seems to be on a trajectory towards becoming and outstanding researcher in cognitive neuroscience.

Adrian's research is directed at understanding the neural basis of face, object, and word recognition. The central questions concern the way in which information about these classes of items is represented and processed within and between different brain areas, and how networks of areas interact to support skilled performance in both categorization and individuation. He adopts a multi-pronged approach to these issues, applying behavioral, computational, and functional neuroimaging methodologies in a tightly coordinated manner.

I've worked most closely with Adrian in the context of a project aimed at exploring the relationship between face and word representation using fMRI. Although these domains are superficially very different, they both place extensive demands on high-acuity visual information and, at first glance, have homologous localizations in inferior occipito-temporal cortex (with a Visual Word Form Area [VWFA] in the left hemisphere and a Fusiform Face Area [FFA] in the right). Adrian's fMRI work shows, both with regard to faces (Nestor et al., 2011, *PNAS*) and words (Nestor et al., submitted, *PNAS*), that this standard view is far too simple: in each domain, individuation (e.g., identifying one face or word among many) is supported by an interacting network of brain areas that includes the conventional fusiform region but extends well beyond it. Moreover, the analyses uncover commonalities in the two networks that suggest a greater degree of intermingling of face and word representations than the conventional view would predict.

Adrian's contributions have been fundamental in all aspects of this project. First and foremost, his expertise both with regard to fMRI experimental methodology and especially with regard to analysis techniques is nothing short of remarkable, and on a par with the best in the field. Many people have the ability to run multivariate pattern analysis (MVPA) over fMRI data, but very few people doing so have the mathematical and computational knowledge to understand the relative strengths and weaknesses of the various approaches and to be able to interpret the results in a critical and informed manner. I have been repeatedly impressed by Adrian's ability to continually refine analysis techniques to compensate for specific aspects of how the data were gathered, in the service of avoiding spurious findings—even ones that might support his views—and uncovering truly robust and theoretically informative ones.

Adrian also brings an uncommon precision to his theoretical perspectives on problems. We have recently begun a related project, focusing specifically on faces, that uses existing computational ap-

proaches to face recognition to generate testable predictions concerning the neural organization of face representation in humans, across the full range of hierarchical levels of processing. Although highly ambitious, the use of explicit computational formalisms to support mechanistic accounts of visual representations has the potential to provide a unified understanding of the neural basis of face recognition. Moreover, the effort should uncover general computational principles that extend to other visual domains as well.

Although I have not seen Adrian teach in a formal setting, I have seen him give numerous research presentations and have also observed him explaining various complicated issues to people with far less sophisticated backgrounds than his own. I am fully confident that he will be an excellent teacher and mentor of students.

Adrian has excelled as a postdoctoral researcher, and I have benefited greatly from working with him. There is no question that I have learned far more from him than the reverse. I will certainly be sorry to see him move on to the next stage of his career. On the other hand, there is no doubt in my mind that he is ready for that step and will make an outstanding faculty member. I recommend him very highly.

Sincerely,

A handwritten signature in black ink, appearing to read "D. C. Plaut". The signature is stylized with a large, looped "D" and a prominent "P".

David C. Plaut

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