UNIVERSITY OF WASHINGTON

Seattle, WA
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Dear Editorial Office:

We would like to submit our manuscript entitled "A Common Architecture for Human and Artificial Cognition Explains Brain Activity Across Domains" for publication as a Research Article in *Science*. The manuscript presents evidence that a general-purpose consensus architecture for artificial cognition, the Common Model of Cognition, provides. The results come from a comparative examination of the CMC's ability to account for neuroimaging data from N = 200 individuals across seven tasks and six cognitive domains. In this comparison, the CMC vastly outperforms other architectures of similar complexity. This comparison was performed by fitting a dynamic network model on a sample of neuroimaging data from the Human Connectome Project, which constitutes the highest-quality public repository of neuroimaging data in existence. Because the data is publicly available and all of our analysis scripts are available on GitHub, these results can be verified and reproduced by anyone in the field.

We believe that the implications of these results make them worthy of your attention. First, our findings provides a preliminary, empirical answer to the long-standing question of how to characterize the human brain's architecture at the highest level. In contrast to the more common, data-driven, bottom up approach, our findings also have a clearer, functional interpretation. Our results also provide a positive answer to the question of whether the lessons learned from cognitively-inspired but artificial system can shed light on the nature of the brain's computations. Finally, this study suggests the tantalizing hypothesis that "intelligence", broadly defined, is matter of functional architecture between specialized components and that it is inherently constrained, since that the evolution of human brains and artificial system seem to have converged on apparently identical solutions. As such, we believe that this contribution

The submission of this article has been **previously discussed with one of your Editors, Dr. Tage Rai**, in a series of emails in February 2019. Dr. Rai thought that this submission would fit well with the aims and scope of *Science*, and with the journal's interest in the nature of human intelligence, the mechanisms of machine intelligence, and the intersection between the two. Because of our previous communication, we would like to request Dr. Rai as the acting editor for this submission.

The manuscript that my co-authors and I are hereby submitting is entirely original, and none of its contents has been published, submitted or is under consideration elsewhere, including the Internet. All of the co-authors listed in the byline have read and agreed on the contents of the manuscript, approved its submission to *Science*, and mutually agreed on the list and order of authors.

Sincerely,

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