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Note: Images available at
https://nyutandon.photoshelter.com/galleries/C0000bm3nk9_B024/G0000a.MzndHT4I4/Collective-Diversity
Immediate Release

New mathematical model shows how diversity speeds consensus

NYU Tandon researchers develop algorithm that predicts complex interactions between leaders and followers in the animal and human worlds

BROOKLYN, New York, Weekday, January 8, 2020 – Scientific literature abounds with examples of ways in which member diversity can benefit a group – whether spider colonies' ability to forage or an industrial company's financial performance. Now, a newly published mathematical framework substantiates the seemingly counterintuitive observations made by prior scholars: Interaction among dissimilar individuals can speed consensus.

The NYU Tandon School of Engineering research team studying under Institute Professor Maurizio Porfiri and Visiting Professor Alessandro Rizzo applied stochastic tools, used to predict random occurrences, because leaders and followers both encounter many unpredictable interactions during their decision-making process. The team's model also accounts for wide varieties of individuals – and individual performance – within a group and recognizes the members' varying ability to make meaningful communications connections.

The model correctly anticipated prior theoretical and empirical observations in which groups of human or animal leaders attempted to steer the dynamics of a set of followers toward a desired state.

"Leader-Follower Consensus on Activity-Driven Networks" is available in *Proceedings of the Royal Society A at* https://royalsocietypublishing.org/doi/10.1098/rspa.2019.0485. The U.S. National Science Foundation, the Italian Ministry of Foreign Affairs and International Cooperation, and the Compagnia di San Paolo supported the research.
Co-authors, along with Porfiri and Rizzo, are doctoral student Jalil Hasanyan and post-doctoral fellows Lonzo Zino and Daniel Alberto Burbano Lombana. Rizzo is a visiting professor from the Politecnico di Torino, Italy.

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