

Rachit Dubey

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Experience & Education

Postdoctoral Research Fellow, MIT Sloan School of Management [Expected start date: Jan 2023]

- 2018– PhD, Computer Science, Princeton University [Expected graduation: Dec 2022]
- 2015–18 MS, Education, University of California, Berkeley, 2018
- 2008– 12 BEng, Computer Science, Nanyang Technological University, Singapore, 2012

Publications

ARTICLES UNDER REVIEW

Kraft-Todd, G. *, **Dubey, R. ***, Yoeli, E., Rand D., & Bhanot S. Public good messaging motivates the wealthy to reduce water consumption. Revision under review at *Psychological Science*. [[preprint](#)]

Dubey, R., Ho, M., Mehta, H., & Griffiths, T.L. *Aha!* moments correspond to metacognitive prediction errors. Under review. [[preprint](#)]

JOURNAL ARTICLES

Dubey, R., Griffiths, T.L., & Dayan, P. (2022). The pursuit of happiness: A reinforcement learning perspective on habituation and comparisons. *PLOS Computational Biology*, 18(8), e1010316. [[See press coverage below](#)]

Dubey, R., Griffiths, T.L., & Lombrozo, T. (2022). If it's important, then I'm curious: Increasing perceived usefulness stimulates curiosity. *Cognition*, 226, 105193.

Dubey, R. *, Mehta, H. *, & Lombrozo, T. (2021). Curiosity is contagious: A social influence intervention to induce curiosity. *Cognitive Science*, 45(2), e12937.

Dubey, R. & Griffiths, T.L. (2020). Understanding exploration in humans and machines by formalizing the function of curiosity. *Current Opinion in Behavioral Sciences*, 35, 118-124.

Dubey, R. & Griffiths, T.L. (2020). Reconciling novelty and complexity via a rational analysis of curiosity. *Psychological Review*, 127(3), 455. [[Featured as a spotlight article in Trends in Cognitive Science](#)]

CONFERENCE PUBLICATIONS

Note: In machine learning and artificial intelligence, conferences are competitively peer-reviewed and are the primary archival venue for published work.

Dubey, R., Agrawal, P., Pathak, D., Griffiths, T. L., & Efros, A. A. (2018). Investigating human priors for playing video games. In *35th International Conference on Machine Learning (ICML)*. [[Long oral presentation: 8% acceptance rate](#)] [[See press coverage below](#)]

Dubey, R. *, Peterson, J. *, Khosla, A., Yang, M. H., & Ghanem, B. (2015). What makes an object memorable?. In *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*.

Dubey, R., Dave, A., & Ghanem, B. (2014). Improving saliency models by predicting human fixation patches. In *Asian Conference on Computer Vision*.

Dave, A. *, **Dubey, R. ***, & Ghanem, B. (2012). Do humans fixate on interest points?. In *21st IEEE International Conference on Pattern Recognition*.

*Equal contribution

Dubey, R., Ni, B., & Moulin, P. (2012). A depth camera based fall recognition system for the elderly. In *International Conference on Image Analysis and Recognition*

CONFERENCE PROCEEDINGS (NON-ARCHIVAL)

Dulberg, Z., **Dubey, R.**, Berwian, I.M., & Cohen, J.D. (2022). Modularity benefits reinforcement learning agents with competing homeostatic drives. In *Proceedings of the 5th Multidisciplinary Conference on Reinforcement Learning and Decision Making*.

Dubey, R., Griffiths, T.L., & Lombrozo, T. (2019). If it's important, then I am curious: A value-based intervention method to induce curiosity. In *Proceedings of the 41st Annual Conference of the Cognitive Science Society*.

Mehta, H.*, **Dubey, R.***, & Lombrozo, T. (2018). Your liking is my curiosity: a social popularity intervention to induce curiosity. In *Proceedings of the 40th Annual Conference of the Cognitive Science Society*.

Dubey, R., & Griffiths, T. L. (2017). A rational analysis of curiosity. In *Proceedings of the 39th Annual Conference of the Cognitive Science Society*.

Book Chapters

Soon, C. S., **Dubey, R.**, Ananyev, E., & Hsieh, P. J. (2017). Approaches to understanding visual illusions. In *Computational and cognitive neuroscience of vision*, (pp. 221-233). Springer, Singapore.

Technical Reports

Dubey, R.*, Grant E.*, Luo, M.*, Narasimhan, K., & Griffiths, T. L. (2020). Connecting context-specific adaptation in humans to meta-learning. *arXiv: 2011.13782*

Awards

- 2021 Princeton Energy and Climate Scholars fellowship
- 2020 Best reviewer award for the 37th International Conference on Machine Learning, ICML, 2020 [ranked top 10%]
- 2020 Best reviewer award for the 34th conference on Neural Information Processing Systems, 2020 [ranked top 8.5%]
- 2017 Graduate School of Education Fellowship Award, Block Grant Award
- 2016 Outstanding Graduate Student Instructor Award, University of California, Berkeley
- 2016 Marascuilo Fellowship Award
- 2016 Graduate School of Education Fellowship Award, Block Grant Award

Teaching Experience

PRINCETON

- 2019 *Graduate Student Instructor*, COS 360: Computational Models of Cognition (Fall 2019) [**Department of Computer Science's nomination for the 2020 Teaching Award**]

UC BERKELEY

- 2018 *Graduate Student Instructor*, CogSci 131: Computational Models of Cognition (Spring 2018)
- 2016 *Graduate Student Instructor*, CogSci 131: Computational Models of Cognition (Fall 2016) [**Outstanding Graduate Student Instructor Award**]
- 2016 *Graduate Student Instructor*, CogSci 1: Introduction to Cognitive Science (Summer 2016)

Mentoring

- 2022– Dhara Kumari Yu, masters student in Computer Science, Stanford University
- 2021–22 Yosi Hatekar, undergraduate in Computer Science, University of Toronto
- 2021–22 Maya Rozenshteyn, undergraduate in Computer Science, Princeton University
- 2021–22 Ayush Chakravarty, undergraduate in CS, UC Davis → Researcher, MILA, Quebec AI Institute
- 2020–21 Rishabh Patra, undergraduate in Computer Science, Birla Institute of Technology and Science, Goa
- 2020–21 Michael Luo, undergraduate in Computer Science, UC Berkeley → PhD student, UC Berkeley
- 2020–21 Jean Luo, undergraduate in Psychology, Princeton University → PhD student, USC
- 2020–21 Nimra Nadeem, undergraduate in Computer Science, Princeton University
- 2017–19 Hermish Mehta, undergraduate in EECS, UC Berkeley
- 2017–18 Madeleine Lee, undergraduate in Psychology, UC Berkeley

Invited Talks

- 2022 Consciousness and AI seminar, Future of Humanity Institute, University of Oxford
Symposium on Intrinsic Rewards, Society for Neuroeconomics
Concepts and Categories (ConCats) Seminar, NYU
- 2021 Climate Psychology and Action Lab, University of California, San Diego
PDP seminar, Princeton University
Schulz lab, Max Planck Institute for Biological Cybernetics, Tubingen, Germany
Active Child workshop, University of Gottingen, Germany
- 2020 Affective Brain Lab seminar, UCL
PDP seminar, Princeton University
- 2019 Princeton Alumni Association Club
Kidd Lab, University of California, Berkeley
Graduate Cognitive Science Seminar, University of Rutgers, New Brunswick
Curiosity, Explanation, & Exploration Workshop, Princeton University
- 2018 Cognition Colloquium, University of California, Berkeley

Media coverage

Press related to work on happiness and reinforcement learning.

DailyMail (UK): [Our brains are programmed to keep wanting more](#)
Medical News Today: [Humans desire to want more may serve an important purpose](#)
Neurologica: [The Psychology of FOMO](#)
Phys Org: [RL-based simulations show human desire to always want more may speed up learning](#)
Radio interview: [Deutschlandfunk \(German\)](#)
This study was also featured as the top post on [reddit r/science](#)

Press related to work on curiosity.

BBC: [Curiosity: the neglected trait that drives success.](#)

Press related to work on human priors and reinforcement learning.

Media Coverage: *MIT Technology Review*, *HiTech News*, *Import AI*
Expository articles and videos: *Arxiv Insights*, *Two Minute papers*, *Severely Theoretical*
In other languages: *Polish*, *German*

Conference Service

Organizer “Combating the climate crisis with cognitive science” workshop, CogSci 2021.
Panelist “Object Representations for Learning and Control” workshop, NeurIPS 2021.

Ad Hoc Reviewing

Journal: Psychological Review, Cognition, Cognitive Science, Memory and Cognition, Cognition and Emotion, Journal of Artificial Intelligence Research, Transactions in Image Processing

Conference proceedings: Neural Information Processing Systems, International Conference on Machine Learning, International Conference on Learning Representations, Cognitive Science Society

Activism

Member of Divest Princeton, Citizens Climate Lobby, and Food & Water watch

Volunteer scientist, Skype A Scientist (2021-)

Volunteer software developer, CareGiver Saathi (2021)

[Developed an app with the NGO to locate oxygen, medicines, and beds during India's worst COVID wave.]

[My app was used by over 10,000 people to find critical life-saving resources during this period.]

Founder and Team lead, Zero Waste Princeton (2019-21)

[Led a group of 30+ students to research and develop strategies to reduce Princeton's food & plastic waste.]

Research Consultant, Yellowstone Ecological Research Center (2019-21)

References

Dr. Thomas L. Griffiths

Henry R. Luce Professor of Information Technology, Consciousness and Culture

Departments of Psychology and Computer Science, Princeton University

Email: tomg@princeton.edu

Dr. Peter Dayan

Executive Director

Department of Computational Neuroscience, Max Planck Institute for Biological Cybernetics

Email: peter.dayan@tuebingen.mpg.de

Dr. Jonathan D. Cohen

Robert Bendheim and Lynn Bendheim Thoman Professor in Neuroscience

Princeton Neuroscience Institute, Princeton University

Email: jdc@princeton.edu