

Eric Schulz

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🌐 <http://cpilab.org>

Employment History

- starting 2020 📌 **Max Planck Research Group Leader.** Computational Principles of Intelligence Lab, MPI for Biological Cybernetics, Tuebingen, Germany.
- 2017-2019 📌 **Data Science Postdoctoral Fellow.** Harvard University, Computational Cognitive Neuroscience Lab (PI: Prof. Samuel Gershman), Cambridge, USA.
- 2013 📌 **Volunteer.** Uganda Virus Research Institute, Entebbe, Uganda.
- 2012 – 2013 📌 **Machine Learning Analyst.** Zalando, Berlin, Germany.
- 2008 – 2010 📌 **Student Research Assistant.** Center for Adaptive Behavior and Cognition, Max Planck Institute for Human Development, Berlin, Germany.

Education

- 2014 – 2017 📌 **PhD Experimental Psychology.** University College London, UK, Supervisor: Dr. Maarten Speekenbrink.
- 2013 – 2014 📌 **MRes Computer Science.** University College London, UK.
- 2011 – 2012 📌 **MSc Applied Statistics.,** University of Oxford, UK.
- 2010 – 2011 📌 **MSc Cognitive and Decision Sciences.,** University College London, UK.
- 2007 – 2010 📌 **Vordiplom Psychology.** Humboldt University, Berlin, Germany.

Publications

- 1 Schulz, E., Betram, L., Hofman, M., & Nelson, J. D. (2019). Exploring the space of human exploration using entropy mastermind. In *Proceedings of the Forty-first Annual Conference of the Cognitive Science Society*.
- 2 Schulz, E., Bhui, R., Love, B. C., Brier, B., Todd, M. T., & Gershman, S. J. (2019). Structured, uncertainty-driven exploration in real-world consumer choice. *Proceedings of the National Academy of Sciences*, 116(28), 13903–13908.
- 3 Schulz, E. & Gershman, S. J. (2019). The algorithmic architecture of exploration in the human brain. *Current Opinion in Neurobiology*, 55, 7–14.
- 4 Schulz, E., Wu, C. M., Ruggeri, A., & Meder, B. (2019). Searching for rewards like a child means less generalization and more directed exploration. *Psychological Science*.
- 5 Wu, C. M., Schulz, E., Gerbaulet, K., Pleskac, T. J., & Speekenbrink, M. (2019). Under pressure: the influence of time limits on human exploration. In *Proceedings of the Forty-first Annual Conference of the Cognitive Science Society*.
- 6 Wu, C. M., Schulz, E., & Gershman, S. J. (2019). Generalization as diffusion: human function learning on graphs. In *Proceedings of the Forty-first Annual Conference of the Cognitive Science Society*.
- 7 Dasgupta, I., Schulz, E., Goodman, N. D., & Gershman, S. J. (2018). Remembrance of inferences past: Amortization in human hypothesis generation. *Cognition*, 178, 67–81.
- 8 Dasgupta, I., Schulz, E., Smith, K. A., Tenenbaum, J. B., & Gershman, S. J. (2018). Learning to act by integrating mental simulations and physical experiments. In *Proceedings of the Fortieth Annual Conference of the Cognitive Science Society*.

- 9 Jones, A., Schulz, E., Meder, B., & Ruggeri, A. (2018). Active function learning. In *Proceedings of the Fortieth Annual Conference of the Cognitive Science Society*.
- 10 Krusche, M., Schulz, E., Guez, A., & Speekenbrink, M. (2018). Adaptive planning in human search. In *Proceedings of the Fortieth Annual Conference of the Cognitive Science Society*.
- 11 Rule, J., Schulz, E., Piantadosi, S. P., & Tenenbaum, J. B. (2018). Learning list concepts through program induction. In *Proceedings of the Fortieth Annual Conference of the Cognitive Science Society*.
- 12 Schulz, E., Speekenbrink, M., & Krause, A. (2018). A tutorial on Gaussian process regression: Modelling, exploring, and exploiting functions. *Journal of Mathematical Psychology*, 85, 1–16.
- 13 Schulz, E., Wu, C. M., Huys, Q. J. M., Krause, A., & Speekenbrink, M. (2018). Generalization and search in risky environments. *Cognitive Science*. doi:10.1101/227322
- 14 Wu, C. M., Schulz, E., Garvert, M. M., Meder, B., & Schuck, N. W. (2018). Connecting conceptual and spatial search via a model of generalization. In *Proceedings of the Fortieth Annual Conference of the Cognitive Science Society*.
- 15 Wu, C. M., Schulz, E., Speekenbrink, M., Nelson, J. D., & Meder, B. (2018). Exploration and generalization in vast spaces. *Nature Human Behaviour*.
- 16 Dasgupta, I., Schulz, E., & Gershman, S. J. (2017). Where do hypotheses come from? *Cognitive Psychology*, 96, 1–25.
- 17 Dasgupta, I., Schulz, E., Goodman, N. D., & Gershman, S. J. (2017). Amortized hypothesis generation. In *Proceedings of the Thirty-Ninth Annual Conference of the Cognitive Science Society*.
- 18 Schulz, E., Klenske, E., Bramley, N. R., & Speekenbrink, M. (2017). Strategic exploration in human adaptive control. In *Proceedings of the Thirty-Ninth Annual Conference of the Cognitive Science Society*.
- 19 Schulz, E., Konstantinidis, E., & Speekenbrink, M. (2017). Putting bandits into context: how function learning supports decision making. *Journal of Experimental Psychology: Learning, Memory, and Cognition*.
- 20 Schulz, E., Tenenbaum, J. B., Duvenaud, D., Speekenbrink, M., & Gershman, S. J. (2017). Compositional inductive biases in function learning. *Cognitive Psychology*, 99, 44–79.
- 21 Wu, C. M., Schulz, E., Speekenbrink, M., Nelson, J. D., & Meder, B. (2017). Mapping the unknown: The spatially correlated multi-armed bandit. In *Proceedings of the Thirty-Ninth Annual Conference of the Cognitive Science Society*.
- 22 Schulz, E., Huys, Q. J., Bach, D. R., Speekenbrink, M., & Krause, A. (2016). Better safe than sorry: Risky function exploitation through safe optimization. In *Proceedings of the Thirty-Eighth Annual Conference of the Cognitive Science Society*.
- 23 Schulz, E., Speekenbrink, M., Hernández-Lobato, J. M., Ghahramani, Z., & Gershman, S. J. (2016). Quantifying mismatch in bayesian optimization. In *NIPS Bayesian Optimization workshop*.
- 24 Schulz, E., Speekenbrink, M., & Meder, B. (2016). Simple trees in complex forests: Growing Take The Best by Approximate Bayesian Computation. In *Proceedings of the Thirty-Eighth Annual Conference of the Cognitive Science Society*.

- 25 Schulz, E., Tenenbaum, J. B., Duvenaud, D., Speekenbrink, M., & Gershman, S. J. (2016). Probing the compositionality of intuitive functions. In *Advances in Neural Information Processing Systems*.
- 26 Parpart, P., Schulz, E., Speekenbrink, M., & Love, B. C. (2015). Active learning as a means to distinguish among prominent decision strategies. In *Proceedings of the Thirty-Seventh Annual Conference of the Cognitive Science Society*.
- 27 Schulz, E., Konstantinidis, E., & Speekenbrink, M. (2015). Exploration-exploitation in a contextual multi-armed bandit task. In *International Conference on Cognitive Modeling* (pp. 118–123).
- 28 Schulz, E., Konstantinidis, E., & Speekenbrink, M. (2015). Learning and decisions in contextual multi-armed bandit tasks. In *Proceedings of the Thirty-Seventh Annual Conference of the Cognitive Science Society*.
- 29 Schulz, E., Tenenbaum, J. B., Reshef, D. N., Speekenbrink, M., & Gershman, S. J. (2015). Assessing the perceived predictability of functions. In *Proceedings of the Thirty-Seventh Annual Conference of the Cognitive Science Society*.
- 30 Schulz, E., Speekenbrink, M., & Shanks, D. R. (2014). Predict choice – a comparison of 21 mathematical models. In *Proceedings of the Thirty-Sixth Annual Conference of the Cognitive Science Society*.
- 31 Cokely, E. T., Galesic, M., Schulz, E., Ghazal, S., & Garcia-Retamero, R. (2012). Measuring risk literacy: the berlin numeracy test. *Judgment and Decision Making*, 7(1), 25.
- 32 Cokely, E. T., Ghazal, S., Galesic, M., Garcia-Retamero, R., & Schulz, E. (2012). How to measure risk comprehension in educated samples. *Transparent Communication of Health Risks*, 29–52.
- 33 Schulz, E., Cokely, E. T., & Feltz, A. (2011). Persistent bias in expert judgments about free will and moral responsibility: a test of the expertise defense. *Consciousness and Cognition*, 20(4), 1722–1731.

Awards

- 2018 ■ **Robert J. Glushko Award** for Outstanding Doctoral Dissertation in Cognitive Science.
- 2017 ■ **Harvard Data Science Postdoctoral Fellowship**.
- 2016 ■ **UCL Bogue Research Fellowship** funding 3 month visit to Harvard (Prof. Samuel Gershman) and MIT (Prof. Joshua Tenenbaum).
- **EPS Grindley Award** to attend the International Conference of Thinking.
- **SLMS Graduate School Conference Fund** to attend the Annual Meeting of the Cognitive Science Society.
- 2015 ■ **UCL Sully Award** for best PhD upgrade talk in the Department of Cognitive, Perceptual, and Brain Sciences.
- **Cognitive Science Travel Award**
- 2013 ■ **ESPRC scholarship** funding both MRes and PhD at UCL by the Centre for Doctoral Training in Financial Computing and Analytics.
- 2011 ■ **Haniel scholarship** funding MSc at the University of Oxford.
- 2010 ■ **DAAD scholarship** funding MSc at University College London.

Invited Talks

- 2019
 - **Max Planck Institute for Human Cognitive and Brain Sciences.** Guest Lecture.
 - **Max Planck Institute for Biological Cybernetics.** MPRG Symposium.
 - **Cognitive Lunch.** MIT.
- 2018
 - **Ohio State Univeristy.** Brown bag seminar series. Invited by Jay Myung.
 - **Early Childhood Cognition Lab.** Lab Meeting at MIT.
 - **ONR Science of Autonomy.** Grant Review.
 - **Ecole Normale Supérieure.** Workshop organized by Stefano Palminteri.
 - **Cognitive Science Conference.** Symposium for Glushko award winners.
- 2017
 - **ConCats seminar series.** New York University.
 - **CBB Lunch.** Harvard University.
 - **Cognitive Psychology Colloquium.** University of Göttingen.
 - **Cognitive Science Colloquium.** University of Onsabrück.
- 2016
 - **London Judgement and Decision Making Seminar.** University College London.
 - **Gershman Lab Meeting.** Harvard University.
 - **Coffee and Tea Talk.** Max Planck Institute for Human Development.
- 2015
 - **Psychology Seminar Series .** City University.
 - **Krause Lab Meeting .** ETH Zürich.
 - **Oberauer Lab Meeting .** University of Zürich.
 - **Economic Psychology Colloquium .** University of Basel.
- 2014
 - **Workshop on Optimal Experimental Design.** Invited Speaker.

Professional Service

- since 2012
 - **Reviewer.** Proceedings of the National Academy of Sciences, Psychonomic Bulletin and Review, Journal of Experimental Psychology: General, Journal of Cognitive Neuroscience, Neural Information Processing and Systems, Cognitive Science Society, PLOS: Computational Biology, Journal of Experimental Psychology: Learning, Memory, and Cognition, Journal of Mathematical Psychology, Nature Human Behaviour.
- 2019
 - **Workshop organizer.** Heuristics, Hacks, and Habits (jointly with Ishita Dasgupta). Workshop at the Annual Meeting of the Cognitive Science Society.
 - **Workshop organizer.** Structure for Efficient Reinforcement Learning (jointly with Nick Franklin). Workshop at the Multi-Disciplinary Conference on Reinforcement Learning and Decision Making.
- 2018
 - **Workshop organizer.** Learning as program induction (jointly with Neil Bramley). Workshop at the Annual Meeting of the Cognitive Science Society.
- 2015-2017
 - **Seminar organizer.** London Judgement and Decision Making seminar series.

Teaching Experience

- 2014-2017
 - **Teaching assistant.** PSYCGR01: Statistics for graduate students.
 - **Ad-hoc lecturer.** PSYCGD04: Knowledge, Learning and Inference.
- 2015
 - **Teaching assistant.** COMPG011: Data Analytics using R.