

Charley M. Wu

Curriculum Vitae

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Nationality: Canadian

Academic Background

Current Position

2016- **Pre-Doctoral Research Fellow**, *Center for Adaptive Rationality (ARC)*, Max Planck
Present Institute for Human Development, Berlin, Germany.

Previous Positions

- 2018 **Visiting Research Fellow**, *Computational Cognitive Neuroscience Lab*; hosted by Samuel J. Gershman), Harvard University, Cambridge MA, USA.
- 2014-2015 **Research Assistant**, *Center for Adaptive Behavior and Cognition (ABC)*, Max Planck Institute for Human Development, Berlin, Germany.
- 2014-2015 **Lead Machine Learning Developer**, *SportsManias*, Miami, FL.
- 2014 **Student Research Scientist**, *PetaByte Research*, Budapest, Hungary.
- 2013-2014 **Research Assistant**, *Intelligent Software Agents and New Media Group*, Austrian Institute for Artificial Intelligence (OFAI), Vienna, Austria.
- 2009 **Research Assistant**, *Center for Human Evolution, Cognition, and Culture (HECC)*, University of British Columbia, Vancouver, Canada.

Education

- 2016-2019 **PhD Candidate**, Max Planck Institute for Human Development; Humboldt University; (Expected) International Max Planck Research School on Adapting Behavior in a Fundamentally Uncertain World, Berlin, Germany.
- 2013-2015 **M.Sc. Cognitive Science**, *University of Vienna*, Vienna, Austria, *with Distinction*.
- 2004-2009 **B.A. Philosophy**, *University of British Columbia*, Vancouver, Canada, *Dean's List*.

Honors and Awards

- 2016- **Pre-Doctoral Fellowship**, *International Max Planck Research School on Adapting Behavior in a Fundamentally Uncertain World (Joint PhD Fellowship in Psychology, Economics, and Law)*, Germany.
- 2014 **Interdisciplinary College (IK) Stipend**, Günne, Germany.
- 2011-2012 **Joseph-Armand Bombardier Canada Graduate Scholarship**, *Social Sciences and Humanities Research Council of Canada (SSHRC)*, Canada, *Declined*.
- 2004 **President's Entrance Scholarship**, *University of British Columbia*, Canada.

Publications

In Prep

- under review Analytis, P. P., Wu, C. M., & Gelastopoulos, A. (under review). Make-or-break: chasing risky goals or settling for safe rewards? *PsyArXiv preprint*. Retrieved from [pdf link](#)
- Novaes Tump, A., Wu, C. M., Bouhlel, I., & Goldstone, R. L. (under review). The evolutionary dynamics of cooperation in collective search. Retrieved from [pdf link](#)
- Schulz, E., Wu, C. M., Ruggeri, A., & Meder, B. (under review). Searching for rewards like a child means less generalization and more directed exploration. *bioRxiv preprint*. Retrieved from [pdf link](#)
- Wu, C. M., Schulz, E., Gerbaulet, K., Pleskac, T. J., & Speekenbrink, M. (under review). Under pressure: the influence of time limits on human exploration. Retrieved from [pdf link](#)
- Wu, C. M., Schulz, E., & Gershman, S. J. (under review). Generalization as diffusion: human function learning on graphs. Retrieved from [pdf link](#)

Peer reviewed articles

- 2018 Bouhlel, I., Wu, C. M., Hanaki, N., & Goldstone, R. L. (2018). Sharing is not erring: pseudo-reciprocity in collective search. In T. T. Rogers, M. Rau, X. Zhu, & C. W. Kalish (Eds.), *Proceedings of the 40th annual conference of the cognitive science society* (pp. 156–161). Austin, TX: Cognitive Science Society. Retrieved from [pdf link](#)
- Schulz, E., Wu, C. M., Huys, Q. J., Krause, A., & Speekenbrink, M. (2018). Generalization and search in risky environments. *Cognitive Science*, 42, 2592–2620. doi:[10.1111/cogs.12695](#)
- 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 T. T. Rogers, M. Rau, X. Zhu, & C. W. Kalish (Eds.), *Proceedings of the 40th annual conference of the cognitive science society* (pp. 1183–1188). Austin, TX: Cognitive Science Society. Retrieved from [pdf link](#)
- Wu, C. M., Schulz, E., Speekenbrink, M., Nelson, J. D., & Meder, B. (2018). Generalization guides human exploration in vast decision spaces. *Nature Human Behaviour*, 2, 915–924. doi:[10.1038/s41562-018-0467-4](#)
- 2017 Wu, C. M., Meder, B., Filimon, F., & Nelson, J. D. (2017). Asking better questions: how presentation formats influence information search. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 8, 1274–1297. doi:[https://doi.org/10.1037/xlm0000374](#)
- Wu, C. M., Schulz, E., Speekenbrink, M., Nelson, J. D., & Meder, B. (2017). Mapping the unknown: the spatially correlated multi-armed bandit. In G. Gunzelmann, A. Howes, T. Tenbrink, & E. J. Davelaar (Eds.), *Proceedings of the 39th annual meeting of the cognitive science society* (pp. 1357–1362). Austin, TX: Cognitive Science Society. Retrieved from [pdf link](#)
- 2016 Barkoczi, D., Analytis, P. P., & Wu, C. M. (2016). Collective search on rugged landscapes: a crossenvironmental analysis. In A. Papafragou, D. Grodner, D. Mirman, & J. Trueswell (Eds.), *Proceedings of the 38th annual conference of the cognitive science society* (pp. 918–923). Austin, TX: Cognitive Science Society. Retrieved from [pdf link](#)

Presentations

Invited Talks

- Jan. 2019 **Wu, C.M.**, *The Successor Representation*, NeuroCode, Max Planck Institute for Human Development, Berlin, Germany.

- Nov. 2018 **Wu, C.M.**, *Guiding Exploration Through Generalization*, Cog Lunch, Department of Brain and Cognitive Sciences, MIT, Cambridge, MA.
- Nov. 2018 **Wu, C.M.**, *Generalization in Vast Spaces*, Concats, New York University, New York City, NY.
- Nov. 2018 **Wu, C.M.**, *Generalization Guides Exploration in Vast Spaces*, Fiery Cushman and Joshua Greene labs, Harvard University, Cambridge, MA.
- Sept. 2018 **Wu, C.M.**, *Guiding Exploration Through Generalization*, Samuel Gershman Lab, Harvard University, Cambridge, MA.
- May. 2018 **Wu, C.M.**, Schulz, E., Speekenbrink, M., Nelson, J.D., & Meder, B., *Generalization and Exploration: Insights from a spatial search task*, Department of Psychiatry and Psychotherapy, Charité - Universitätsmedizin, Berlin, Germany.
- Sept. 2017 **Wu, C.M.**, Schulz, E., Speekenbrink, M., Nelson, J.D., & Meder, B., *Generalization and Exploration in Vast Spaces*, Centre for Mind/Brain Sciences (CIMEC), University of Trento, Trento, Italy.
- May. 2017 **Wu, C.M.**, Schulz, E., Speekenbrink, M., Nelson, J.D., & Meder, B., *Active Learning and Search in Unexplored Environments*, iSearch Lab, Max Planck Institute for Human Development, Berlin, Germany.
- Apr. 2017 **Wu, C.M.**, Schulz, E., Speekenbrink, M., Nelson, J.D., & Meder, B., *Generalization Across Vast State Spaces: Human Exploration in Unknown Environments*, Cognition Lab, University of Zürich, Zürich, Switzerland.
- Mar. 2017 **Wu, C.M.**, *Terra Incognita: Adaptive Learning and Information Search in Unknown Environments*, The Center for Adaptive Rationality (ARC), Max Planck Institute for Human Development, Berlin, Germany.
- Feb. 2017 **Wu, C.M.**, Nelson, J.D., & Meder, B., *Adaptive Learning for Language Education*, Babbel, Berlin, Germany.
- Nov. 2016 **Wu, C.M.**, Schulz, E., Speekenbrink, M., Nelson, J.D., & Meder, B., *Mapping the Unknown: Human Spatial Exploration-Exploitation*, Learning & Decision Making Lab, University College London, London, UK.
- Feb. 2016 **Wu, C.M.**, Nelson, J.D., & Meder, B., *Functional Entropy for Understanding Ruggedness in Fitness Landscapes*, Entropy Workshop (DFG SPP 1516), Ludwigsburg, Germany.

Conference Presentations, Workshops, and Seminars

- Dec. 2018 **Wu, C.M.**, *Inference over graph structures using a diffusion kernel*, Berlin Machine Learning Seminar, Berlin, Germany.
- Jul. 2018 **Wu, C.M.**, Schulz, E., Garvert, M.M., Meder, B., & Schuck, N.W., *Connecting conceptual and spatial search*, CogSci 2018, Madison, WI.
- Jul. 2018 Bouhlel, I., **Wu, C.M.**, Hanaki, N., & Goldstone, R.L., *Sharing is not erring: Pseudo-reciprocal sharing in collective search*, CogSci 2018, Madison, WI.
- Jul. 2018 **Wu, C.M.**, & Meder, B., Nelson, J.D., *Navigating uncertainty through information search*, Poster presented at CogSci 2018, Madison, WI.
- Jul. 2018 **Wu, C.M.**, Schulz, E., Speekenbrink, M., Nelson, J.D., & Meder, B., *Guiding exploration through generalization*, MathPsych 2018, Madison, WI.
- Mar. 2017 **Wu, C.M.**, Schulz, E., Speekenbrink, M., Nelson, J.D., & Meder, B., *Mapping the Unknown: The spatially correlated multi-armed bandit.*, CogSci 2017, London, UK.

- Mar. 2017 **Wu, C.M.**, Schulz, E., Speekenbrink, M., Nelson, J.D., & Meder, B., *Mapping the Unknown: Model-based and Model-free Approaches Towards Spatial Reinforcement Learning*, TeaP 2017, Dresden, Germany.
- Mar. 2017 **Wu, C.M.**, *Everybody GANs Now: Tutorial on Generative Adversarial Networks*, Berlin Machine Learning Seminar, Berlin, Germany.
- Mar. 2017 **Wu, C.M.**, *Voyage into the Unknown: Adaptive Learning and Information Search*, IMPRS Thesis Workshop, Gut Gremmelin, Germany.
- Mar. 2017 **Wu, C.M.**, *Adversarial Training: Math and Methods Tutorial*, Center for Adaptive Behavior and Cognition (ABC), Berlin, Germany.
- Oct. 2016 **Wu, C.M.**, *Model Comparison: Statistical Workshop*, ABC Research Retreat, Gut Gremmelin, Germany.
- Aug. 2016 **Wu, C.M.**, Jurányi, Z., Gulyas, L., & Kampis, G., *Blindfolded NLP: Unsupervised Learning for Automatically Generating Topic Labels*, Identification, Location and Temporal Evolution of Topics Workshop, Budapest, Hungary.
- Jul. 2016 **Wu, C.M.**, Schulz, E., Speekenbrink, M., Nelson, J.D., & Meder, B., *Exploring the Unknown: Modeling Human Exploration-Exploitation Behavior*, Poster presented at Computational and Mathematical Modeling of Cognition, Dobbiaco, Italy. [\[PDF\]](#).
- Mar. 2016 **Wu, C.M.**, *Gaussian Process Models: What do you do when you can't optimize?*, Berlin Machine Learning Seminar, Berlin, Germany.
- Feb. 2016 **Wu, C.M.**, *Exploring Fitness Landscapes: How to discover good solutions to complex problems*, IMPRS Thesis Workshop, Berlin, Germany.
- Feb. 2016 **Wu, C.M.**, Nelson, J.D., & Meder, B., *Characterizing Ruggedness in Fitness Landscapes*, ABC Conference, Berlin, Germany.
- Aug. 2015 **Wu, C.M.**, Meder, B., Nelson, J.D., & Filimon, F., *The effect of presentation formats on rational information search*, SPUDM 25, Budapest, Hungary..
- Jun. 2015 **Wu, C.M.**, Meder, B., Filimon, F., & Nelson, J.D., *The medium is the message: How presentation formats help people ask better questions*, MEi: CogSci Conference, Ljubljana, Slovenia.
- Feb. 2015 Meder, B., **Wu, C.M.**, Nelson, J. D., & Filimon, F., *Presentation formats and information search*, Workshop on "Information, search, and causes: Rational and cognitive approaches", Turin, Italy.
- Jun. 2014 **Wu, C.M.**, Skowron, M., & Petta, P., *Reading between the lines: a vector space model of language using semantic role structures*, Poster presented at MEi:CogSci Conference 2014, Kraków, Poland. [\[PDF\]](#).

Teaching

- Jan. 2018 **Seminar**, *Computational Modeling Workshop*, MPRG iSearch Research Retreat, Bensdorf, Germany.
- Sep. 2017 **Seminar**, *Computational Models of Cognition*, Berlin School of Mind and Brain (Cognitive Science Graduate Course), Humboldt University, Berlin, Germany.

Professional Service

Organizer of the 17th annual Summer Institute on Bounded Rationality, Berlin, Germany (2018)
PhD Representative for the Max Planck Institute for Human Development (2017-2018)

Ad-hoc Reviewer for Nature Human Behaviour (1), Cognitive Science Society (11), Mind & Society (1), and Futures & Foresight Science (1)

Technical Skills

Programming Languages: R, Python, Matlab, JavaScript, HTML, jQuery, PHP, CSS, and \LaTeX .

Additional Software Skills: MongoDB, MySQL, Tensorflow, SKlearn, GenSim, NLTK, Redis, and Adobe Creative Suite.

Other: Sound engineer, musician, and recording artist with five albums of original music and experience booking tours across Canada and the US.

References

Prof. Dr. Björn Meder
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Prof. Dr. Jonathan D. Nelson
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