

# THEODORE R. SUMERS

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## EDUCATION

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- Princeton University** Fall 2019 - Spring 2024  
PhD in Computer Science  
Dissertation: *Grounding communication in real-world action*  
Advisor: Dr. Thomas L. Griffiths
- Dartmouth College** Fall 2008 - Spring 2013  
AB and BE in Electrical Engineering, Cum Laude

## PROFESSIONAL EXPERIENCE

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- Google DeepMind** 2022  
*Research Scientist Intern*  
Research on large-scale vision-language models and embodied agents (paper accepted at *ICML*).
- Uber Technologies** 2014 – 2019  
*Data Scientist → Engineering Manager II*  
Founded an applied research team (grew to 6 researchers) focusing on machine learning and signal processing ([tech talk](#)). My work resulted in patents (below), a critical regulatory certification ([press release](#)), and major product launches (including [driving safety analysis](#), [crash detection](#), and [network efficiency](#)).
- Automatic Labs** 2013 – 2014  
*Data Scientist*  
10th employee at early-stage Y Combinator startup. Sirius XM acquired Automatic for >\$100M in 2017.
- Bridgewater Associates, LP** 2012  
*Technology Associate Intern*  
Backtesting framework for experimental trading algorithms.

## JOURNAL ARTICLES (\* denotes equal contribution)

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- Sumers, T.\***, Yao, S.\*, Narasimhan, K., & Griffiths, T. L. (2023). Cognitive Architectures for Language Agents. *In review*.
- Sumers, T.\***, Kumar, S.\*, Yamakoshi, T., Goldstein, A., Hasson, U., Norman, K., ... & Nastase, S. (2022). Shared functional specialization in transformer-based language models and the human brain. *In review*.
- Sumers, T.**, Ho, M., Griffiths, T., & Hawkins, R. (2023). Reconciling truthfulness and relevance as epistemic and decision-theoretic utility. *Psychological Review* (in press).
- Sumers, T.**, Ho, M., Hawkins, R., & Griffiths, T. (2023). Show or Tell? Exploring when (and why) teaching with language outperforms demonstration. *Cognition*, 232, 105326.
- Thompson, B., Van Opheusden, B., **Sumers, T.**, & Griffiths, T. (2022). Complex cognitive algorithms preserved by selective social learning in experimental populations. *Science*, 376(6588), 95-98.

## CONFERENCE PAPERS

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**Sumers, T., Marino, K., Ahuja, A., Fergus, R., & Dasgupta, I.** (2023). Distilling internet-scale vision-language models into embodied agents. *International Conference on Machine Learning (ICML)*, in *Proceedings of Machine Learning Research* 202:32797-32818.

Marjeh, R., van Rijn, P., Sucholutsky, I., **Sumers, T.**, ... & Jacoby, N. (2023). Words are all you need? Language as an approximation for human similarity judgments. *International Conference on Learning Representations (ICLR)*, 11.

**Sumers, T., Hawkins, R., Ho, M., Griffiths, T., & Hadfield-Menell, D.** (2022). How to talk so AI will learn: Instructions, descriptions, and autonomy. *Neural Information Processing Systems (NeurIPS)*, 35, 34762-34775.  
- *Best Paper Award* at Language and Reinforcement Learning Workshop (NeurIPS '22)  
- *Spotlight Oral* at Human and Machine Collaboration and Teaming Workshop (ICML '22)

**Sumers, T., Ho, M., Hawkins, R., Narasimhan, K., & Griffiths, T.** (2021). Learning rewards from linguistic feedback. *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*, Vol. 35, No. 7, pp. 6002-6010.

**Sumers, T., Hawkins, R., Ho, M., & Griffiths, T.** (2021). Extending rational models of communication from beliefs to actions. *Proceedings of the 43rd Annual Meeting of the Cognitive Science Society*.

**Sumers, T., Ho, M., & Griffiths, T.** (2020). Show or Tell? Demonstration is More Robust to Changes in Shared Perception than Explanation. *Proceedings of the 42nd Annual Meeting of the Cognitive Science Society*.

## PATENTS

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Irish, A., Ramasamy, D., Beinstein, A.J., **Sumers, T.**, Shekar, H. and Sankaravadivel, V., Uber Technologies Inc, 2023. *Inferring vehicle location and movement using sensor data fusion*. U.S. Patent 11,686,862.

Purdy, D., Chen, L. and **Sumers, T.**, Uber Technologies Inc, 2021. *Cascaded boosted predictive models*. U.S. Patent 11,138,524.

Brinig, K., Ioffe, M., Layton, B., **Sumers, T.** and Kadous, M.W., Uber Technologies Inc, 2020. *Trip termination determination for on-demand transport*. U.S. Patent 10,672,198.

Badalamenti, J., Inch, J., Sanchez, C.M. and **Sumers, T.**, Uber Technologies Inc, 2019. *Pickup location selection and augmented reality navigation*. U.S. Patent 10,508,925.

De, N., Tyagi, D., Sullivan, J., Wahba, K., **Sumers, T.**, Beinstein, A. and Su, G., Uber Technologies Inc, 2019. *Vehicle monitoring system*. U.S. Patent 10,445,950.

Badalamenti, J., Inch, J., Sanchez, C.M. and **Sumers, T.**, Uber Technologies Inc, 2019. *Augmented reality assisted pickup*. U.S. Patent 10,423,834.

**Sumers, T.**, Uber Technologies Inc, 2019. *Network computer system for analyzing driving actions of drivers on road segments of a geographic region*. U.S. Patent 10,297,148.

Cui, S., Nguyen, T.D., **Sumers, T.**, Yu, M. and Zhang, X., Uber Technologies Inc, 2018. *Simplifying GPS data for map building and distance calculation*. U.S. Patent 9,939,276.

## FELLOWSHIPS AND AWARDS

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<b>NDSEG Fellowship</b>	2021-2024
<b>Best Paper Award</b> , Language and Reinforcement Learning Workshop (NeurIPS)	2022
<b>Semifinalist</b> , Global Social Entrepreneurship Competition	2012

<b>Semifinalist</b> , Dell Social Innovation Challenge	2012
<b>Winner</b> , EPA People, Prosperity, Planet Grant (\$15k)	2011
<b>Winner</b> , IEEE Outstanding Humanitarian Prize	2011

## INVITED TALKS

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<b>DeepMind</b> , Economics Group	2023
<b>Air Force Research Lab</b> , Human Learning & Cognition Forum	2023
<b>DeepMind</b> , Reward Design Group	2022
<b>Stanford</b> , Computational Cognitive Science Lab	2022
<b>MIT</b> , Complang Talk Series	2022
<b>Talking Robotics Podcast</b>	2022
<b>Air Force Office of Scientific Research</b> , Trust & Influence Program Review	2022
<b>Princeton</b> , Parallel and Distributed Processing Talk Series	2022
<b>Princeton</b> , Cognitive Lunch Talk Series	2021

## TEACHING EXPERIENCE

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*Graduate Teaching Assistant* - Princeton University

- Computer Science: An Interdisciplinary Approach (Fall 2020, Spring 2021)

*Undergraduate Teaching Assistant* - Dartmouth College

- Digital Electronics (Spring 2012; named "Outstanding Teaching Assistant")

## MENTORING EXPERIENCE

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### Princeton University

- Yosi Hatekar (Undergraduate at University of Toronto, now software engineer at AMD)
- Maya Malaviya (Lab manager at Princeton, now PhD candidate at Stevens Institute of Technology)
- Andi Peng (PhD candidate at MIT)

### Uber Technologies

- Hired and led a team of 6 research engineers (all MS or PhD).
- Supported their career development, including successful promotion of 3 team members.
- Direct reports included:
  - Nikolaus Volk (now co-founder / CEO at Kyte)
  - Travis Addair (now co-founder / CTO at Predibase)
  - Olcay Cirit (now Senior Staff Research Scientist, Uber AI)
  - Pushkarini Agharkar (now Staff Software Engineer, Google)
  - Mohammad Shafkat Amin (now Staff Software Engineer, Facebook)
  - Lucinda Zhao (now Engineering Manager, Strava)

### Dartmouth College

- As President of Tau Beta Pi (the Engineering Honors society), established a mentorship program connecting freshmen engineering majors with high-achieving juniors and seniors.

## PROFESSIONAL SERVICE

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*Ad-hoc Reviewer* for:

- Neural Information Processing Systems - 2023
- International Conference on Machine Learning, Theory of Mind workshop - 2023

- Proceedings of Cognitive Science Society - 2022, 2023
- Psychological Review - 2022
- Association for Computational Linguistics, Learning from Language Supervision workshop - 2022

### **Uber Technologies**

*Bar Raiser* (2014-2019)

I was recognized as a top interviewer at the company and contributed to organizational hiring by (1) interviewing candidates for other teams and (2) moderating their debriefs to mitigate hiring biases.

### **Dartmouth Humanitarian Engineering**

*President* (2011-2012), *Project Lead* (2010-2011), *Tech Lead* (2009-2010)

I led an undergraduate organization with 50+ members and 100k+ budget, partnering with local NGOs to develop sustainable engineering projects in East Africa. I won multiple competitions and grants to support our work (see Fellowships and Awards), served as *project lead* for a team of 10 students implementing small-scale hydropower in Rwanda, and *tech lead* for a team of 4 on clean cookstoves in Tanzania.

### **Tau Beta Pi Engineering Honors Society**

*President* (2012), *Member* (2011)

Elected to the Engineering Honors Society based on GPA and personal character. As *President*, started a mentorship program to support prospective engineering majors (see Mentorship Experience).