

# Sean P. Anderson

Palo Alto, CA

✉ seanpaul@stanford.edu | 🏠 spascience.github.io | 🎓 scholar

## Education

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### Stanford University

Ph.D. in Psychology

*Palo Alto, CA*

*Sep 2023–Present*

### University of Michigan

M.S. in Computer Science and Engineering

*Ann Arbor, MI*

*Sep 2021–Dec 2022*

### University of Michigan

B.S. in Cognitive Science, with Highest Honors and High Distinction (Top 10%)

*Ann Arbor, MI*

*Sep 2016–Aug 2020*

### University of Michigan

B.M. in Performance (French Horn), with Highest Honors

*Ann Arbor, MI*

*Sep 2016–Aug 2020*

## Grants & Fellowships

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- 2024 **Norman H. Anderson Research Fund**, Department of Psychology, Stanford University  
CogSci
- 2023 **Graduate Research Fellowship**, National Science Foundation
- 2022 **William R. and Flora Hewlett Foundation Conference Travel Grant**, University of Michigan - Rackham  
Int'l Conference on Computational Creativity
- 2022 **Student Registration Scholarship**, Association for Computational Creativity  
Int'l Conference on Computational Creativity
- 2019 **Student Travel Award**, National Academy of Sciences  
Arthur M. Sackler Colloquium
- 2019 **Conference Travel Grant**, Weinberg Institute for Cognitive Science, University of Michigan  
CogSci, ICCM/MathPsych
- 2019 **Conference Travel Grant**, Weinberg Institute for Cognitive Science, University of Michigan  
NeurIPS
- Winter 2019 **CogSci Student Fellowship**, Weinberg Institute for Cognitive Science, University of Michigan
- Summer 2018 **CogSci Student Fellowship**, Weinberg Institute for Cognitive Science, University of Michigan
- Winter 2018 **CogSci Student Fellowship**, Weinberg Institute for Cognitive Science, University of Michigan
- Fall 2017 **CogSci Student Fellowship**, Weinberg Institute for Cognitive Science, University of Michigan
- Summer 2017 **CogSci Student Fellowship**, Weinberg Institute for Cognitive Science, University of Michigan
- 2016 **Board of Regents Merit Scholarship**, University of Michigan

## Academic Honors

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- 2021 **Arthur Miller Creative Arts Award**, University of Michigan  
1/9 prizes for exceptional honors theses in liberal arts
- 2021 **Samuel D. Epstein Award**, Weinberg Institute for Cognitive Science, University of Michigan  
Outstanding honors thesis in theoretical cognitive science
- 2021 **James B. Angell Scholar**, University of Michigan  
Seven consecutive terms of all A's
- 2019 **Research Spotlight (web)**, Weinberg Institute for Cognitive Science, University of Michigan
- 2016–2020 **University Honors**, University of Michigan

## Research Experience

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### Cognitive and Data Science Lab

*Rutgers University–Newark*

#### Research Assistant

*Sep 2020–Aug 2023*

*Mentors: Prof. Patrick Shafto, Dr. Scott Cheng-Hsin Yang*

Working on human and machine cooperation in projects such as DARPA XAI (conference paper), DARPA ASIST (poster), and explanations of RL systems (ongoing), drawing upon the cognitive science of cooperative communication.

### The Cognitive Foundations of Social Minds

*University of Michigan*

#### Research Assistant

*Jul 2021–Present*

*Mentors: Prof. Richard Lewis, Dr. Max Kleiman-Weiner*

Using Reinforcement Learning and Unity games to investigate the computational capacities underlying cooperation in primates, human children, and adults.

## Undergraduate Research Experience

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### Cognition, Control, and Action Lab

*University of Michigan*

#### Research Assistant

*May 2017–Aug 2020*

*Mentors: Prof. Taraz G. Lee*

Implemented and analyzed experiments in motor learning, leading to a first-author publication on motivation and knowledge in skilled motor performance.

### Generative Linguistics and Music Project

*University of Michigan*

#### Research Assistant

*Sep 2019–Aug 2020*

*Mentors: Prof. Somangshu Mukherji*

**Honors Thesis title:** A linguistic model of minimalist syntax composes *tebe poem*

Drawing on Minimalist generative linguistics, I built a computational model of Western tonal harmony that recovered the underlying structure of Bortniansky's *Tebe poem*. I presented my award-winning honors thesis in a public-facing talk to artists interested in data science.

### Language and Cognitive Architecture Lab

*University of Michigan*

#### Research Assistant

*Jun 2019–Sep 2019*

*Mentors: Prof. Richard Lewis, Dr. Pyeong Whan Cho*

Designed tools for simulating probabilistic context-free grammars (PCFG) to investigate how we process sentences while reading.

## Laboratory of Dr. Chandra Sripada

### Research Assistant

Mentors: Prof. Chandra Sripada

For an fMRI study on spontaneous thought and the default-mode network, I developed methods for removing extraneous noise from in-scanner speech recordings.

University of Michigan

Jun 2018–Dec 2018

## Music Theory @ Michigan Institute for Data Science Project

### Research Assistant

Mentors: Prof. René Rusch

Analyzed tonal structures in German part-song from the nineteenth century.

University of Michigan

Sep 2018–Dec 2018

## Publications

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### JOURNAL ARTICLES

Anderson, S. P., Adkins, T. J., Gary, B. S., & Lee, T. G. (2020). Rewards interact with explicit knowledge to enhance skilled motor performance. *Journal of Neurophysiology*, 123(6), 2476-2490. doi: <https://doi.org/10.1152/jn.00575.2019>

### CONFERENCE PROCEEDINGS

McCarthy, W.P., Anderson, S. P., Fan, J. E. (2024, July). How does assembling an object affect memory for it? In *Proceedings of the 46th Annual Meeting of the Cognitive Science Society*. Rotterdam, Netherlands.

Folke, T., Yang, S. C.-H., Anderson, S., & Shafto, P. (2021, April). Explainable AI for medical imaging: explaining pneumothorax diagnoses with Bayesian teaching. In *Proceedings SPIE 11746, Artificial Intelligence and Machine Learning for Multi-Domain Operations Applications III* (p. 117462J). International Society for Optics and Photonics. doi: <https://doi.org/10.1117/12.2585967>

## Invited Talks

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Anderson, S. P. (2021, October). When is machine learning not enough? Capturing common structures across music and language. Presented at “Building equitable ecologies of artificial intelligence and machine learning: A mini-symposium with artists & data scientists,” Data Science and Machine Learning for Artists Workshop. Ann Arbor, Michigan.

## Presentations

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Anderson, S. P. (2022, June). A proposal for automatic harmony analysis with Minimalist syntax. Presented at the 13th International Conference on Computational Creativity, Doctoral Consortium. Bolzano, Italy.

Yang, S. C.-H., Anderson, S., Wang, P., Rank, C., Folke, T., & Shafto, P. (2021, July). Inferring knowledge from behavior in search-and-rescue tasks. Poster presented at the 43rd Annual Conference of the Cognitive Science Society. Vienna, Austria.

Anderson, S. P., Adkins, T. J., Gary, B. S., & Lee, T. G. (2019, July). Explicit cues lead to reward-related enhancements in motor skill performance. Poster presented at the 41st Annual Conference of the Cognitive Science Society. Montréal, Québec, Canada.

Anderson, S. P., Adkins, T. J., Gary, B. S., & Lee, T. G. (2019, March). Explicit cues lead to reward-related enhancements in motor skill performance. Poster presented at the 2019 CogSci Community Undergraduate Cognitive Science Colloquium. Ann Arbor, Michigan.

Anderson, S. P. (2018, October). Studying creativity. Presented during the CogSci Community Weekly Discussion. Ann Arbor, Michigan.

Anderson, S. P., & Kamper, D. (2018, April). College admissions: making the most of high school. Presented at the 3rd Refugees to College Seminar Series at Central Academy. Ann Arbor, Michigan.

Kamper, D., & Anderson, S. P. (2018, February). College admissions: an overview for parents. Presented at the 1st Refugees to College Seminar Series at Central Academy. Ann Arbor, Michigan.

## Teaching

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### **UARTS 260: Telemann Chorale Project**

*University of Michigan*

Teaching Assistant

*Fall 2021*

**Mentors:** Prof. Somangshu Mukherji

Served as a TA in one of several Faculty Engineering+Arts Student Teams (FEAST) at University of Michigan. Advised a team of 10 undergraduates in developing a computational model (constraint satisfaction) of Baroque chorale structure and part-writing.

## Service

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### **Computational Cognitive Science Reading Group**

*Stanford Psychology*

Organizer

*Apr 2024–present*

### **COGRAPH 2024 Workshop at CogSci '24**

*Rotterdam, Netherlands*

Co-Organizer

*Jul 2024*

### **Graduate Program Committee**

*Stanford Psychology*

Student Representative

*Sep 2023–Sep 2024*

### **NeurIPS 2019**

*Vancouver, BC, Canada*

Student Volunteer

*Dec 2019*

### **Refugees to College**

*Ann Arbor, MI*

**Vice Director, Volunteer Case Worker**

*Oct 2016–Aug 2020*

Standing with UNHCR's #WithRefugees Coalition, we work to increase resettled refugees' access to higher education and professional opportunities through educational workshops and bespoke consulting.