

## ABOUT ME

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I am an incoming Ph.D. student at the University of Michigan co-advised by Drs. Honglak Lee and Joyce Chai. I am interested in intelligence, both artificial and biological. I develop computational systems that emulate the manner in which humans infer general knowledge from small amounts of evidence.

## SKILLS

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- **Languages:** Python, C++, JavaScript, HTML, MATLAB, Bash
- **Software Tools:** PyTorch, Jax, NLTK, Transformers, W&B, Scikit-Learn, NumPy, SciPy, Git, Docker, OpenMP, Selenium, Playwright, Flask
- **Other:** DSP, FEA, CFD, Global Optimization

## EDUCATION

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### The University of Michigan

Ph.D. in Computer Science and Engineering

Ann Arbor, MI

Fall 2024

### The University of Michigan

M.S. in Computer Science and Engineering

Ann Arbor, MI

2022–2024

- Year 1: Natural Language Processing, Randomness and Computation, Computational Modeling of Cognition
- Year 2: Machine Learning, Reinforcement Learning, Advanced Compilers, Computer and Network Security

### The University of Texas at Austin

B.S. in Computational Engineering, Certificate in Evidence and Inquiry

Austin, TX

2016–2020

- Thesis: “Cognitive Processes: A Whiteheadian Perspective”
- Major Coursework: Probability, Stochastic Processes, Differential Eq., Linear Algebra, Scientific Computation
- Certificate Coursework: Mathematical Neuroscience, Neural Systems I and II, Philosophy of Mind

## SCHOLARSHIPS AND AWARDS

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- NSF Graduate Research Fellowship Winter 2024  
*Awarded to students pursuing graduate research in STEM fields*
- CSE Department Outstanding Graduate Student Instructor Award Winter & Fall 2023  
*Awarded to less than 3% of graduate student instructors in the CS department. Won both semesters spent teaching*
- Northrop Grumman BRAVO to our Stars 2021–2022  
*Awarded on occasion to high-performing employees. Won once for operational efficiency and twice for performance*
- FSTI Award for Excellence in Chemistry Spring 2018  
*For poster presentation at Undergraduate Research Forum at UT Austin. Awards given to less than 6% of participants*
- TIDES Advanced Summer Research Fellowship Summer 2017  
*Fellowship for computational chemistry research at the Henkelman Group under the Freshman Research Initiative*
- Engineering Honors Scholarship 2016–2020  
*Undergraduate honors program and scholarship awarded to roughly 10% of the UT Austin engineering class*
- Polymathic Scholars Interdisciplinary Humanities and Natural Science Honors 2016–2020  
*Multidisciplinary thesis program that allows students to design their own certificate*

## PUBLICATIONS

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- [1] Y. Huang, **J. Sansom**, Z. Ma, F. Gervits, and J. Chai, “DriVLMe: Exploring Foundation Models as Autonomous Driving Agents That Perceive, Communicate, and Navigate”, in *VLADR*, 2024.
- [2] Z. Ma, **J. Sansom**, R. Peng, and J. Chai, “Towards A Holistic Landscape of Situated Theory of Mind in Large Language Models”, in *Findings of EMNLP*, 2023.
- [3] E. Lejeune, A. Khang, **J. Sansom**, and M. Sacks, “FM-Track: A Fiducial Marker Tracking Software for Studying Cell Mechanics in a Three-Dimensional Environment”, in *SoftwareX* 11, 2020, p. 100 417.
- [4] A. Khang, A. Rodriguez, M. Schroeder, **J. Sansom**, E. Lejeune, and M. Sacks, “Quantifying Heart Valve Interstitial Cell Contractile State Using Highly Tunable Poly(Ethylene Glycol) Hydrogels”, in *Acta Biomaterialia* 96, 2019, pp. 354–367.

## RESEARCH EXPERIENCE

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### **LG AI Research**

Ann Arbor, MI

Research Intern

2023–Current

- Designed and implemented a cloud-hosted Docker infrastructure to collect a large dataset of internet navigation trajectories via Amazon Mechanical Turk
- Investigating the use of LLMs for automated internet navigation and sequential decision making

### **Situated Language and Embodied Dialogue (SLED) Lab**

Ann Arbor, MI

Research Assistant

2022–Current

- Proposed and developed a novel method for evaluating Theory of Mind capacity within LLMs
- Studying grounded language acquisition in embodied AI agents for applications in robotics

### **Willerson Center for Cardiovascular Modeling and Simulation**

Austin, TX

Research Assistant

2018–2020

- Co-developed FM-Track, an open-source Python package that processes 3D microscope imagery
- Helped create a hierarchical model of AVIC activation, a phenomenon that frequently causes valve diseases
  - \* Simulated novel experimental procedures using computational techniques such as ML and FEA
  - \* Used empirical data to develop models of cell activation using the math of continuum mechanics

### **Henkelman Research Group**

Austin, TX

Research Assistant

2017

- Doubled the efficiency of a Python algorithm used for high-dimensional, non-convex, global optimization

## ENGINEERING EXPERIENCE

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### **Northrop Grumman**

San Diego, CA

Systems Engineer (Technical Level II), Pathways Rotational Training Program

2020–2022

- Leveraged my expertise in the HW-, SW-, and algorithm-level architecture of a fielded, software-defined radio to:
  - \* Assist a cross-organizational team with the design and deployment of a novel DSP algorithm
  - \* Author and obtain customer funding for a proposal detailing improvements to a fielded DSP algorithm
- Created the AI Corporate Catalog, a company-wide database of AI/ML capabilities
- Led a small team in the design and deployment of a C++ unit testing infrastructure

### **Ansys Government Initiatives (formerly Analytical Graphics Inc.)**

Exton, PA

Corporate Systems Engineering Intern

Summer 2019

- Used Python to quantify the accuracy of orbital decay forecasts in STK, AGI's primary software offering
- Helped develop multiple simulations that modeled orbital dynamics, communications links, and terrain effects
- Outlined a strategy to bolster STK's collaborative capabilities and presented it to the senior development team

## TEACHING EXPERIENCE

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- **Graduate Student Instructor** at the University of Michigan (**Outstanding GSI Award**)    Winter & Fall 2023  
*Introduction to Natural Language Processing (EECS 487)*

## PRESENTATIONS

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- X. Feng, A. Khang, **J. Sansom**, N. West, D. Ilitzky, N. Aufiero, E. Lejeune, and M. Sacks, "A Simulation of Heart Valve Interstitial Cell Contractile Behavior in 3D Gels", presented at the BMES 2020 Virtual Annual Meeting, Oct. 2020.
- A. Khang, E. Lejeune, **J. Sansom**, N. West, and M. Sacks, "Quantifying the 3D Mechanical Traction of the Aortic Heart Valve Interstitial Cell", presented at the BMES 2019 Virtual Annual Meeting, Oct. 2019.
- **J. Sansom** "Investigating Methodology for Global Optimization," presented at the College of Natural Sciences Undergraduate Research Forum. April 13th, 2018; Austin, TX. (**FSTI Award for Excellence in Chemistry**)

## EXTRACURRICULAR ACTIVITIES

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- Chair of Northrop Grumman Pathways Professional Development Committee    2021–2022  
*Planned and successfully launched a new technical mentorship program for early-career engineers*
- Volunteer at the Arc and the Rosedale School    2018–2019  
*Helped adults and children with cognitive disabilities develop life skills and provided constant positive feedback*
- Undergraduate Representative for the Society for Industrial and Applied Mathematics    2018–2019  
*Worked with leaders to offer membership and resources to the new undergraduate computational sciences program*
- Eagle Scout and Troop Guide in the Boy Scouts of America    2016  
*Led a team of 30 to construct shelves for a homeless shelter. Taught younger scouts various scouting skills*