Jesse Roberts **July, 2024**

CONTACT INFORMATION
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752 Welch Ave
Cookeville, TN 38501

RESEARCH INTERESTS
AI/ML, Computational Physics, Search/RL/Controls/Automation in cyber-physical systems, Theoretical Computer Science, Language, Games

EDUCATION

Vanderbilt University, Nashville, Tennessee

Ph.D. Candidate, Computer Science — August 2024
- Dissertation Topic: "A Theoretical & Empirical Analysis of Language Model Behavior"
- Advisor: Doug Fisher

Tennessee Technological University, Cookeville, Tennessee

M.S. Electrical Engineering — Spring 2017
- Thesis Topic: Machine Learning Improvement of Solar MPPT
- Advisor: Indranil Bhattacharya

B.S. Electrical Engineering — Spring 2014

FACULTY EXPERIENCE

Vanderbilt University, Nashville, Tennessee

CS 1101 - Programming and Problem Solving (Java Based) — Summer 2020
- Quote from student evaluation: "Prof Roberts has probably been the best teacher I've had at Vandy. He always answers any questions before students even realize they have them."

Tennessee Technological University, Cookeville, Tennessee

ECE 3270 - PLC Lecture & Lab — Spring 2020 - Present
- Developed OER lab manuals for teaching beginner PLC programming, emphasizing good coding practices.

ECE 4961 & 4971 - Capstone Design I and II — Fall 2021 - Present
- Complete redevelopment of curriculum to facilitate assessment and sustainability.

ECE 3540 - Physical Electronics — Fall 2023 - Spring 2024

SERVICE EXPERIENCE

University Service

Tennessee Technological University
- ACME Building Design College Committee — Spring 2022 - Current
- ABET Assessment Departmental Committee — Fall 2021 - Current
- Founding Advisor to the Rock Climbing Club — Fall 2022 - Current
- IEEE Robotics Team Coach — Fall 2021 - Current

Research Service

Communities: *ACL, IEEE, ASEE, CIS*
- Session Chair for WCCI — 2024
- Reviewer for CoNLL — 2024
- Reviewer for IEEE Conference on Games (AI & Game Theory) — 2022-2024
- Reviewer for ASEE National Conference — 2022-2023

Awards, Honors, and Grants

Vanderbilt University

- Reived the American Bureau of Shipping merit Scholarship — Fall 2021
- Nominated for the Graduate Leadership Anchor Award — Spring 2021
- Nominated for the CF Chen best paper award — Spring 2024
- Received the Vanderilt Award for Doctoral Discovery — Summer 2024

Tennessee Technological University

- Awarded a Carnegie Fellowship — Fall 2018
- Awarded OER Development Grant — Fall 2023
- Awarded IEEE AESS Grant for the DARPA Triage Challenge — Spring 2024
- Nominated for the KEEN Foundation Rising Star Award — Spring 2024

Publications

(Invited Contribution) D. Fisher, K. Moore, J. Roberts, "Theory of Formal Languages, Automata, and Computation", (2024) `https://en.wikibooks.org/wiki/Theory_of_Formal_Languages,_Automata,_and_Computation`

(Under Review at CoNLL) Roberts, Jesse, et al. "Large Language Model Recall Uncertainty is Modulated by the Fan Effect." arXiv preprint arXiv:2407.06349 (2024).

(Under Review at EMNLP) Moore, Kyle, et al. "The Base-Rate Effect on LLM Benchmark Performance: Disambiguating Test-Taking Strategies from Benchmark Performance." arXiv preprint arXiv:2406.11634 (2024).

(Under Review at NeurIPS) J. Roberts, Moore, & Fisher, D.(2024). "Do Large Language Models Learn Human-Like Strategic Preferences?".

J. Roberts, (2024). "How Powerful are Decoder-Only Transformer Neural Models?". 2024 International Joint Conference on Neural Networks (IJCNN) arXiv preprint arXiv:2305.17026.

Roberts, Jesse. "Do Large Language Models Learn to Human-Like Learn?." Proceedings of the AAAI Symposium Series. Vol. 3. No. 1. 2024.

Roberts, J., Moore, K., Wilenzick, D., & Fisher, D. (2024, March). Using Artificial Populations to Study Psychological Phenomena in Neural Models. In Proceedings of the AAAI Conference on Artificial Intelligence (Vol. 38, No. 17, pp. 18906-18914).

J. Roberts, (2022). Rock Climbing Route Generation and Grading as Computational Creativity. arXiv:2311.02211

J. Roberts, "Finding an Equilibrium in the Traveler's Dilemma with Fuzzy Weak Domination," IEEE International Conference on Games 2021. **Nominated for best paper.**

J. Roberts and D. Fisher, "pReview: The Artificially Intelligent Conference Reviewer," IEEE International Conference on Machine Learning Applications 2020.

J. Roberts and D. Fisher, "Extending the Philosophy of Computational Criticism," International Conference on Computational Creativity 2020.

J. Roberts and D. Talbert, "Biologically Extending the Gen 2 ANN Model." The Thirty-Second International Flairs Conference. 2019.

Publications cont'd

J. Roberts and I. Bhattacharya, "Improving Any Arbitrary MPPT Hill Climber with ANN Estimations," 2017 IEEE 44th Photovoltaic Specialist Conference (PVSC), Washington, DC, 2017, pp. 3083-3087.

J. Roberts and I. Bhattacharya, "MNFIS and other soft computing based MPPT techniques: A comparative analysis," 2016 IEEE 43rd Photovoltaic Specialists Conference (PVSC), Portland, OR, 2016, pp. 3247-3251.

J. Roberts, "MNFIS+; or, a Better Hybrid Heuristic Maximum Power Point Tracker," Thesis. Tennessee Technological University, 2017.

Professional Memberships

Institute of Electrical and Electronics Engineers (IEEE)	2021 - Current
The Association for the Advancement of Artificial Intelligence (AAAI)	2023 - Current
Computational Intelligence Society (IEEE CIS)	2024 - Current

Industry Experience

ATC Automation, Cookeville, Tennessee

Senior Controls Engineer **May, 2014 - January, 2021**

Designed, oversaw build, and programmed automation equipment to meet customer requirements and exceed expectations while maintaining profitability. Total value of projects oversaw in excess of 20 million dollars.

Co-op Program Manager **July, 2018 - December, 2020**

Developed a co-op program to improve recruitment. Oversaw hiring, training, and management of co-op employees. Acted as the liaison for the building and maintenance of industrial/academic relations. Obtained a $100K industry lab grant.

Research Assistant Experience

Vanderbilt University

- Researched computational sustainability funded by NSF Grant No. 1521672. — Summer 2021

Teaching Assistant Experience

Vanderbilt University

- Project in Artificial Intelligence — Spring 2021
- Programming and Problem Solving (Java Based) — Fall 2020
- Compiler Construction — Spring 2020
- Database Management Systems (Managing TA) — Fall 2019

Graduate Courses Taken

Vanderbilt University

CS6388 - Model Integrated Computing	Fall 2020
CS8395 - Neurodiversity Inspired Science & Engineering	Fall 2020
CS6360 - Advanced Artificial Intelligence	Spring 2020
CS5260 - Artificial Intelligence	Fall 2019
CS6362 - Advanced Machine Learning	Fall 2019
CS8395 - Computation & Cognition	Fall 2019

Tennessee Technological University

CSC6903 - Learning Theory	Fall 2018
CSC7980 - Stock Market Prediction Models	Spring 2018
FIN6020 - Financial Management	Spring 2018
CSC7240 - Intelligent Information Systems	Fall 2017
CSC6903 - Advanced Reverse Engineering	Fall 2016
ECE6580 - Instrument Transducer Technology	Fall 2016
ECE6900 - Intelligent System Design	Fall 2015
ECE6040 - Signal Analysis	Spring 2015

ECE6250 - Random Signals & Systems	Spring 2015
ECE6170 - High Performance Embedded System Design	Fall 2014
ECE6200 - Linear Systems Analysis	Fall 2014
ECE6600 - Computer Methods for Power System Analysis	Fall 2014