# Jesse Roberts

**August, 2024**

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| <small>CONTACT INFORMATION</small> | Jesse.TN.Roberts@Gmail.com<br>(865) 719-0163<br>752 Welch Ave<br>Cookeville, TN 38501 |

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| <small>RESEARCH INTERESTS</small> | AI/ML, NLP, Transformers, ANNs, Search/RL/Controls/Automation in cyber-physical systems, Theoretical Computer Science, Language, Games |

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<small>EDUCATION</small>

**Vanderbilt University**, Nashville, Tennessee

Ph.D. 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

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<small>FACULTY EXPERIENCE</small>

**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

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<small>SERVICE EXPERIENCE</small>

**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* | |
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| | • 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

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

(Accepted to AAAI Fall Symposium) Roberts, Jesse, Lindsey Roberts, and Alice Reed. "Supporting the Digital Autonomy of Elders Through LLM Assistance." arXiv preprint arXiv:2407.15695 (2024).

(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).

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.

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

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| 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** |
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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** |
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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**

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|---|---|
| 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**

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|---|---|
| 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 |

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|---|---|
| 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 |