CURRICULUM VITAE

STEPHEN WORMALD

Electrical & Computer Engineering
University of Florida

1. Personal Data

Role: Ph.D. Student in the Applied Artificial Intelligence Group (https://aaig.ece.ufl.edu/)
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2. Career Objective

To apply Machine Learning (ML) systems in studying longevity and lengthening human health-spans. My focus is ML that operates in real-time while remaining explainable and power-efficient, which is relevant to control problems prevalent across microfluidics systems, wearables, and rapid processing of big-data. Experience developing ML theory, explainable algorithms, and real-time ML systems complements my industrial experience in leading research teams that studied laser-powderbed additive manufacturing. Having designed and run experiments, written grants and proposals, and transitioned multiple Small Business and Innovation Research (SBIR) to their Phase II, I am prepared to engage with interdisciplinary teams that focused on applications of ML to biotechnology.

3. Research Interests

Applied Artificial Intelligence, Image Processing and Computer Vision, Machine Learning and Deep Learning, Inverse Reinforcement Learning (IRL), RL, and XAI, Hardware Acceleration of ML

4. Education

(Ongoing) Ph.D., University of Florida, 2026, Electrical & Computer Engineering
Dissertation Topic: *Hardware Acceleration of Explainable Artificial Intelligence*
Advisor: Damon L. Woodard, Ph.D.

M.S., University of Florida, 2023, Electrical & Computer Engineering

B.S., Cedarville University [ABET Accredited], 2019, Mechanical Engineering

5. Professional Experience

Florida Institute for National Security, 2022 – Present, Graduate Research Assistant

Florida Institute for Cyber Security, 2021 – 2022, Graduate Research Assistant

Applied Optimization, 2021 – 2023, Machine Learning Consultant (Applied Optimization)

Applied Optimization, 2017 – 2021, Mechanical Engineering Team Lead

Cedarville University, 2018 – 2019, Remote Control Hydrofoil Boat Design Project

Cedarville University, 2016 – 2017, Undergraduate teaching assistant of Engineering Graphics

Piedmont Design Group, 2016, LLC – Civil Engineering Internship

VEX Robotics Summer Camp, Northern Virginia Community College

6. Certificates

Cell Culturing Certificate, University of Florida, 2023, Gainesville, FL

C++ Computer Science Certificate, UDACITY Online Nanodegree Program, 2021

7. PUBLICATIONS (ORDERED BY RECENCY)

Journal Articles

[J4] *Accepted*: Wormald, S., Koblah, D., Maldaner, M. K., Forte D., & Woodard, D. L. (2024). eXpLogic: Explaining Logic Types and Patterns in DiffLogic Networks. International Conference of Information Technology. https://doi.org/10.48550/arXiv.2503.09910

[J3] *Accepted*: Wormald, S., Maldaner, M. K., O'Connor, K. D., Dizon-Paradis, O. P., & Woodard, D. L. (2024). Abstracting General Syntax for XAI after Decomposing Explanation Sub-Components. http://dx.doi.org/10.21203/rs.3.rs-4824427/v1

[J2] Dizon-Paradis, O. P, Wormald S. E., Capecci, D. E., Bhandarkar A., and Woodard, D. L. (2024). Resource usage evaluation of discrete model-free deep reinforcement learning algorithms. Reinforcement Learning Journal, ISBN 979-8-218-41163-3, 2024. Accepted.

[J1] Wormald, S., Clingenpeel, J., Vincent, T., & Chaudhary, A. (2021). Integrated computational materials engineering to Predict dimensions for Steady-State and Transient Melt-Pool formation in the selective laser melting Of Inconel 625. *Integrating Materials and Manufacturing Innovation*. https://doi.org/10.1007/s40192-021-00223-6

Conference Presentations

[C2] "Resource Usage Evaluation of Discrete Model-Free Deep Reinforcement Learning Algorithms," Reinforcement Learning Conference, Amherst, MA, United States, August 2024

[C1] "Transition to Application for Feature-specific Additive Manufacturing Parameter Prediction to Reduce Defects in the As-built Material," ASTM, ICAM International Conference on AM, November 2021.

Informally Published

[I2] Wormald, S. E., Napoli, N. J., Mitchell, G. S., & Marciante, A. B. (2025). *Rodent breathing waveforms in ApoE rats: Statistical and entropic differentiation* (arXiv:2505.05387). https://doi.org/10.48550/arXiv.2505.05387

[I1] Dizon-Paradis, O. P., Wormald, S. E., Zhu, M., Wilson, R., & Woodard, D. L. (2024). LfRLD: Learning from Reinforcement Learning Demonstrations. Authorea Preprints. https://doi.org/10.36227/techrxiv.172927301.18452996/v1

Mentored Research, Publications, and Posters

[M11] *Submitted*: O'Connor, K., Wormald, S., & Woodard, D. (2025). Causal clusters: Representing explainable features learned by deep neural networks as causal graphs. UF Center for Undergraduate Research (CUR), Spring Undergraduate Research Symposium. (Submitted).

[M10] *Submitted*: Bloomquist, E., Cole, A., Wormald, S., & Woodard, D. (2025). From black-box to glass-box models: Toward explainability in reinforcement learning. UF Center for Undergraduate Research (CUR), Spring Undergraduate Research Symposium. (Submitted).

(Continued)

[M9] Maldaner, M. K., Valle, R., Nayab, L., Wormald, S., Forte, D., & Woodard, D. (2025). Accelerating real-time inference with FPGA-implemented logic gate neural networks. *Florida Undergraduate Research Conference (FURC).*

[M8] Wormald, S., Koblah, D., Maldaner, M. K., Forte, D., & Woodard, D. (2025). ExpLogic: Explaining logic types and patterns in DiffLogic networks. HiPerGator Symposium.

[M7] Maldaner, M. K., Valle, R., Nayab, L., Wormald, S., Forte, D., & Woodard, D. (2025). Accelerating real-time inference with FPGA-implemented logic gate neural networks. *Florida Undergraduate Research Conference (FURC).*

[M6] Wormald, S., Koblah, D., Maldaner, M. K., Forte, D., & Woodard, D. (2025). ExpLogic: Explaining logic types and patterns in DiffLogic networks. HiPerGator Symposium.

[M5] Bowman, W., Patel, S., Pu, R., Wormald, S., & Woodard, D. (2024). Towards transparent AI: Envisioning comprehensive frameworks for explainability. University of Florida AI Days.

[M3] Maldaner, M. K., Wormald, S., Dizon-Paradis, O., & Woodard, D. L. (2024). Ethical horizons in neuro-symbolic AI. UF Center for Undergraduate Research (CUR), Spring Undergraduate Research Symposium.

[M2] Ambrose, K., Dizon-Paradis, O., Wormald, S. E., & Woodard, D. L. (2024). Causal AI: The frontier of cause and effect in AI. UF Center for Undergraduate Research (CUR), Spring Undergraduate Research Symposium.

[M1] Maldaner, M. K., Wormald, S., Dizon-Paradis, O., & Woodard, D. L. (2024). Neuro-symbolic AI: Merging neural networks and symbolic reasoning for AI transparency. Florida Undergraduate Research Conference (FURC).

8. Professional Leadership and Service Activities

2022 – Present, Mentored 13 undergraduate students in machine learning,

2022 – Present, CyberGatorz vice president at University of Florida

2017 – 2018, ASME section president at Cedarville University

2017, Engineering event coordinator at Cedarville University

2017, Frederick Rescue Mission – Camp counselor and summer school tutor

2017, L'Arcada summer camp in Spain – Camp counselor

9. Honors, Awards, and Scholarships

2025, Best Student Paper Award – International Conference on Information Technology (ITNG)

2022, UF Masters Scholarship

2018, Tau Beta Pi member and scholarship

2018, "Nehemiah Award" scholarship from Cedarville University

2016, 1st in robotics team intercollegiate competition at Cedarville University

2016, 1st in truss design competition at Cedarville University

2015, 2019 - Dean's honor list – Eight semesters at Cedarville University

10. Technical Skillset

ML and Computer Science

- C++ and Python
- Clustering Techniques
- Deep Learning (Pytorch)
- Dimensionality Reduction
- Explainable Artificial Intelligence
- Inverse Reinforcement Learning
- MATLAB
- Reinforcement Learning

Software/Hardware

- 3D Printing
- FPGA Programming
- HDL Design
- ImageJ
- LaTeX
- Microsoft Office
- ParaView
- SolidWorks

Soft Skills

- Communication
- Creative Thinking
- Public Speaking
- Team Management
- Technical Writing