

# IAN WHITEHOUSE

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## EDUCATION

### University of Maryland

*Doctor of Philosophy in Computer Science*

College Park, MD

August 2024 – May 2029

- Advised by Dr William Regli and Dr. Wolfgang Losert, researching analog, neuromorphic, and living computing systems through dynamical systems and learning theory
- Relevant coursework: Computational Imaging, Machine Learning Theory, Numerical Optimization

### American University

*Bachelor of Science in Computer Science, summa cum laude*

Washington, DC

August 2020 – May 2024

- Won the Lockheed Martin STEM Scholarship and Dean's Scholarship, inducted into Upsilon Pi Epsilon society
  - Relevant Coursework: High-Performance Computing, Introduction to Simulation and Modeling, Differential Equations, Calculus III, Introduction to Data Mining, Introduction to Computer Science I, II & III
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## EXPERIENCE

### University of Maryland

*Graduate Assistant, Department of Computer Science*

College Park, MD

August 2024 – Present

- Developed and implemented quantitative performance metrics for analog SAT solvers for a DARPA-funded program
- Worked with chemists, biologists, and physicists to characterize and build in-vitro living neuron reservoirs
- Developed and evaluated a glia-inspired learning algorithm for detecting concept drift in evolving dynamical systems

### U.S. Army Research Laboratory

*Neuromorphic Computing Intern*

Adelphi, MD

May 2025 – August 2025

- Adapted in-house neuromorphic algorithms for concept drift detection in collaboration with Lockheed Martin
- Developed analysis pipelines to extract connectivity and dynamical structure from living neuron time-series data
- Integrated experimental and computational methods to connect in-vitro neural activity with real-world biocomputing

### Leidos, Inc.

*Machine Learning Intern, Leidos Innovation Center*

Arlington, VA

May 2023 – August 2024

- Developed efficient, interpretable machine-learning models for low-SNR underwater acoustic sensing
- Presented research on adversarial learning to U.S. Navy personnel at the NAML conference
- Used differential-equation models and digital signal processing to generate sensor data and analyze model behavior

### American University

*Research Assistant, Institute for IDEAS and Department of Computer Science*

Washington, DC

September 2021 – May 2024

- Devised, developed, and studied a novel machine-learning architecture for detection of gravitational waves
- Contributed to and co-authored 3 publications exploring multimodal data fusion and concept drift detection
- Designed, 3D printed, and partially built a human-sized robot, with applications in media and emergency medicine

### Lockheed Martin

*Student Software Engineer, Rotary and Mission Systems*

Syracuse, NY

May 2022 – August 2022

- Wrote high-performance C++ software to improve parsing, modeling, and simulation of E-2D airborne radar systems
  - Implemented binary data ingestion and server-side playback pipelines to support radar test and evaluation workflows
  - Worked with teammates to integrate new tests and meet evolving customer expectations
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## PUBLICATIONS [Download](#)

**I. Whitehouse**, H. Kang and W. Losert “Emergent Detection of Concept Drift within the Glia-Inspired ‘Rhythmic Sharing’ Algorithm,” preprint (under review), 2026.

R. O’Loughlin, B. Oripov, N. Skuda, N. Chongsiriwatana, **I. Whitehouse**, W. Losert, B. Hayes, A. McCaughan and S. Buckley, “ $\delta$  Multiplexed Gradient Descent: Perturbative Learning with Astrocytes,” *Proceedings of the IEEE Conference on Neuro-Inspired Computational Elements (NICE)*, Atlanta, United States, 2026.

**I. Whitehouse**, R. Yepez-Lopez and R. Corizzo, “Distributed Concept Drift Detection for Efficient Model Adaptation with Big Data Streams,” *Proceedings of the 2023 IEEE International Conference on Big Data*, Sorrento, Italy, 2023.

L. P. Damasceno, E. Rexhepi, A. Shafer, **I. Whitehouse**, N. Japkowicz, C. C. Cavalcante, R. Corizzo and Z. Boukouvalas, “Exploiting Sparsity and Statistical Dependence in Multivariate Data Fusion: An Application to Misinformation Detection for High-Impact Events,” *Machine Learning*, 2023.

L. P. Damasceno, E. Rexhepi, A. Shafer, **I. Whitehouse**, C. C. Cavalcante, R. Corizzo and Z. Boukouvalas, “Independent Vector Analysis with Sparse Inverse Covariance Estimation: An Application to Misinformation Detection,” in *Proceedings of the IEEE 33rd International Workshop on Machine Learning for Signal Processing (MLSP)*, Rome, 2023.

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## PRESENTATIONS [Download](#)

- N. Skuda\*, R. O’Loughlin, B. Oripov, N. Chongsiriwatana, **I. Whitehouse**, W. Losert, B. Hayes, A. McCaughan and S. Buckley, “ $\delta$  Multiplexed Gradient Descent: Perturbative Learning with Astrocytes”, Atlanta, GA: *IEEE Conference on Neuro-Inspired Computational Elements (NICE)*, 2026.
- I. Whitehouse\***, N. Chongsiriwatana, R. O’Loughlin, B. Oripov, N. Skuda, W. Losert, B. Hayes, A. McCaughan and S. Buckley, “From Astrocytes to Novel Algorithms: Multiplexed Gradient Descent and Rhythmic Sharing”, Atlanta, GA: *IEEE Conference on Neuro-Inspired Computational Elements (NICE)*, 2026.
- N. Chongsiriwatana\*, **I. Whitehouse**, A. Emenheiser, S. Gates III, K. Perry, K. O’Neill and W. Losert, “Information Propagation and Classification in Living Neural Networks”, Denver, CO: *American Physical Society Global Physics Summit*, 2026.
- I. Whitehouse\***, N. Chongsiriwatana, H. Kang and W. Losert, “Rhythmic Sharing: An Astrocyte-Inspired Algorithm for Robust Learning of Evolving Dynamical Systems with Applications in Anomaly Detection”, Washington, DC: *Joint Mathematics Meeting (JMM)*, 2026.
- I. Whitehouse\***, H. Kang and W. Losert, “Emergent Detection of Concept Drift within the Glia-Inspired ‘Rhythmic Sharing’ Algorithm”, San Diego, CA: *10<sup>th</sup> International Conference on Rebooting Computing (ICRC)*, 2025.
- S. Sarkar\*, A. Singh and **I. Whitehouse\***, “Bridging In-Vitro Neural Dynamics and Real-World Applications: Experimental, Analytical, and Computational Approaches in Biocomputing”, Aberdeen, MD: *National Security Scholars Summer Internship Program*, 2025.
- I. Whitehouse\*** and G. Byrne, “Adversarial Machine Learning Training for Signal-to-Noise Generalization in Passive Undersea Acoustics”, San Diego, CA: *Naval Applications of Machine Learning (NAML)*, 2024.
- I. Whitehouse\*** and R. Corizzo, “Gravitational Wave Detection with Novel Machine Learning Models”, Washington, DC: American University College of Arts and Sciences, 2022.
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## SKILLS AND INTERESTS

- **Scientific Computing:** Python (NumPy, JAX, PyTorch, TensorFlow, HuggingFace); C++; Java; Apache Spark; JavaScript
  - **Machine Learning Paradigms:** reservoir computing, convolutional networks, transformers, diffusion models
  - **Professional Interests:** neuromorphic algorithms and hardware, living neuron computing, nonlinear dynamical systems
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## REFERENCES

- **Ph.D. Advisors:** Dr. William Regli (regli@umd.edu); Dr. Wolfgang Losert (wlosert@umd.edu)
- **Undergraduate Advisor:** Dr. Roberto Corizzo (rcorizzo@american.edu)
- **Internship Supervisor:** Dr. Greg Byrne (gregory.a.byrne@leidos.com)