Vanessa Arndorfer

vanessa.arndorfer@gmail.com | varndorfer.github.io | varndorfer | varndorfer

Education

University of Washington, MS in Computer Science — Sept 2022 – June 2025

- GPA: 3.91/4.0
- *Advisor*: Michael Stiber
- *Thesis*: Network Behavior Analysis of Spike Timing Dependent Plasticity (STDP) in Simulated Neural Networks
- **Coursework:** Machine Learning, Deep Learning, Data Mining for Machine Learning

Virginia Tech, BS in Computer Science, Mathematics — Aug 2016 – May 2020

- Minor in Cybersecurity

Research Interests

Interdisciplinary applied machine learning within other STEM fields. Applications of interest include:

- Environmental solutions
- Smart homes and smart cities
- Resource management
- Climate modeling

Research Experience

Graduate Student — Sept 2024 - June 2025

University of Washington — Bothell, WA

Advisor: Michael Stiber

- Completed and validated a C++ implementation of a STDP multiplicative model for simulating the refinement phase of neural growth
- Developed a novel data analysis pipeline using Python and Matlab to process and visualize spike train and synaptic weight datasets
- Compared network behavior changes between the growth phase (prior to synaptic weight modification by STDP) and the subsequent refinement phase

Undergraduate Researcher — Sept 2019 - May 2020

Virginia Tech Hume Center for National Security and Technology — Blacksburg, VA

Advisor: William Headley

- Investigated adding perturbations to a radio frequency signal to prevent an eavesdropper from decoding the signal
- Researched and compared two spectral deception loss functions to use as feedback for improving an adversarial machine learning network

Undergraduate Researcher — Sept 2018 - May 2019

Virginia Tech Hume Center for National Security and Technology — Blacksburg, VA

Advisor: William Headley

- Developed a convolutional neural network architecture to classify 21 radio frequency signal types
- Wrote and applied custom Python feature augmentation functions on over-the-air and computer generated signals to create robust “cyborg" data sets of both real and synthetic data

Undergraduate Researcher — Sept 2017 - May 2018

Virginia Tech Hume Center for National Security and Technology — Blacksburg, VA

Advisor: Thomas Krauss

- Programmed neural networks in TensorFlow to identify signal waveforms
- Applied Markov decision process to monitor state changes in an airport surveillance radar

Industry Experience

Software Engineer II, Microsoft – Redmond, WA Aug 2020 – July 2025

- Collaborated across teams to enable new notification features in backend C# cloud services that enhance user experience with more thorough alerts via email and webhooks
- Designed, implemented, and deployed a cross-platform webhook feature that automates machine learning workflows using CI/CD platforms
- Presented at design review meetings to integrate with cloud service architecture and drive feature development
- Leveraged data scientist feedback to improve features and resolve bugs which led to on-boarding 2 new customers to AzureML

Software Engineer Intern, Microsoft – Redmond, WA May 2019 – Aug 2019

- Generated baseline metrics in Python to compare four feature selection algorithms using eleven benchmark datasets
- Conducted end-to-end machine learning experiments hosted on an Azure Virtual Machine
- Analyzed the latest feature selection research and collaborated with Microsoft research teams to improve our algorithm

Software Systems Intern, Northrop Grumman – San Diego, CA May 2018 – Aug 2018

- Automated product testing for pilot software used to control unmanned aerial vehicles (UAVs)

Web Development Intern, Housefax – Haymarket, VA May 2017 – Aug 2017

Publications

Accepted for Publication

- **V. Arndorfer**, M. Stiber. "Effects of Spike Timing Dependent Plasticity on structure and behavior of simulated neural networks," in Complex Networks & Their Applications XIV, December 9-11, 2025.

Published

- M. DelVecchio, **V. Arndorfer**, and W. C. Headley, "Investigating a Spectral Deception Loss Metric for Training Machine Learning-based Evasion Attacks," in Proceedings of the 2nd ACM Workshop on Wireless Security and Machine Learning, July 2020, pp. 43–48. doi: 10.1145/3395352.3402624.
- W. H. Clark, **V. Arndorfer**, B. Tamir, D. Kim, C. Vives, H. Morris, L. Wong, and W. C. Headley, "Developing RFML Intuition: An Automatic Modulation Classification Architecture Case Study," in MILCOM 2019 - 2019 IEEE Military Communications Conference (MILCOM), Nov. 2019, pp. 292–298. doi: 10.1109/MILCOM47813.2019.9020949.

Presentations

- Arndorfer, V. (December, 2025). *Effects of Spike Timing Dependent Plasticity on structure and behavior of simulated neural networks* [Paper presentation]. Complex Networks and their Applications 2025, Binghamton, NY, United States.

Mentoring

Cohort Leader and Organizer, **Microsoft Intern Cohorts**, 2021 - 2022

Skills

Languages: Python, Matlab, C++, C, Java, C#, LATEX

Technologies: Git, REST APIs, Azure

Interests

Fiber Arts: Crochet, knitting, cross-stitch

Running: 2025 Portland Marathon, 2025 La Jolla Half Marathon, 2024 Seattle Half Marathon, 2024 Orca Half Marathon, 2021 Mt. Rainier Half Marathon

Favorite Books: The Three-Body Problem, Babel, The Martian, Ready Player One