Seth Briney – Machine Learning Engineer	
Email:	SethLBriney@gmail.com
Website:	SethBriney.com

Master of Science - Computer Science	Master of Science - Mathematics	BA/BS
Western Washington University	*Western Washington University*	*TESC*
GPA 3.87 | Year: 2023	GPA 3.87 | Year: 2019	2017

Technical Skills

Python Modules: Gymnasium/OpenAiGym, MatPlotLib, Numpy, Pandas, PyGame, PyTorch, RL-Baselines Zoo 3 / Stable Baselines 3, SciKit-Learn, TensorFlow, WandB
Cloud and Virtualization: AWS, Azure, Colab, Docker, SSH
Computational Techniques: Bayesian Decision Theory, Distributed Computing, Transfer Learning
Data: EnergyPlus, Excel, SQL
Languages: BASH, C, C++, C#, Java, Julia, MATLAB/Octave, Python, R
Machine Learning: Deep Learning, Reinforcement Learning, Statsitical Data Analysis
Workflow: Git, LaTeX, Linux, Project Collaboration

Notable: Python (6 years), Pytorch (4 years), Numpy (5 years), Linux (10 years), Machine Learning (7 years).

Project: **Super Mario Bros AI**	Computer Vision	NOV 2023 - PRESENT

- Computer Vision algorithm based control task, learning from RGB pixel input.
- Designed and implmented modern wrapper for Farama's Super Mario Bros (SMB) Gymnasium environment to work with current bleeding edge algorithms, such as CnnLstmPolicy from SB3-Contrib.
- Trained various existing Atari-optimized CNN based PPO configurations, visualizing best runs.
- Improved performance by feature engineering actions, enabling agent to reach level 2 90% faster.

Research Associate	Western Washington University	AUG 2023 - JAN 2024

- In a funded collaboration with PNNL, applied deep reinforcement learning toward constrained energy control and reference tracking in a variety of physics simulators, including building energy simulations.
- Tuned and compared DRL control algorithms including: A2C, DDPG, PPO, SAC, TD3, TQC, and TRPO.
- Contributed to the open source Neuromancer project, being recognized as a notable contributor in the development team; using Git for version control, developed test cases and documentation to conform to existing standards, for getting pull requests integrated into main branch.
- Communicated complex AI concepts and solutions aided by visualizations, to technical and non-technical audiences in full-group meetings with PNNL collaborators.

Project: **Neuromancer**	Constrained Energy Management	FEB 2023 - PRESENT

- Contributed to the **Neuromancer** open-source project, acting as the lead programmer in PslGym to wrap PSL systems (physics simulators) in a Farama Gymnasium interface for DRL control with existing libraries (Stable Baselines 3 / RL Zoo 3, and SKRL).
- Created graphical frameworks for debugging and visualizing results including an interactive TwoTank control game, using Matplotlib and Pygame.
- Added random walk variants to the Signals Neuromancer sub-module for robust sampling in data generation.
- Engineered relevant features from raw data to enhance model performance, e.g., circular encodings.

Graduate Research Assistant	Western Washington University	MAR 2022 - AUG 2023

- Grant funded research collaboration related to Load Forecasting project described below.
- Delivered on a complete ML model development/deployment cycle in electric load forecasting.
- Deployed various Deep Learning ML models into production, improving on previous R^2 metric to 0.98.
- Collaborated with building domain experts to ensure expertise was embedded in model selection.

Project: **Load Forecasting**	Supervised Learning | Deep Learning	APR 2022 - PRESENT

- Developed predictive machine learning models for load forecasting in commercial office buildings.
- Completed full machine learning development cycle, validating and testing results.
- Automated pipeline for generating building data, utilizing large-scale distributed computing with HP Condor, generating over ten billion datapoints in 3 days.
- Time-series deep learning architectures explored include: LSTM, MLP, Res-Net CNN, and Transformer.
- Applied various transfer and meta learning techniques for cross-climate training, improving performance by 9% over training on a single climate.
- Pytorch was used for all deep learning models, Pandas for dataframe management.

College Tutor	*Bellingham Tech.*, Skagit Valley Col.	DEC 2019 - MAR 2022

- Collaborated with excellent teams of college tutors, many of whom had advanced degrees.
- Worked with a diversity of students from various backgrounds and cultures, aiding course understanding.

Graduate Teaching Assistant	Western Washington University	OCT 2021 - MAR 2022

- Served as Teaching Assistant for 4 classes in the computer science department.
- Worked hands-on with students to aid in understanding and development of Java and Python code.

Teaching Assistant	The Evergreen State College	OCT 2020 - JUN 2021

- Worked hands-on with students from design through implementation of AI applications in reinforcement learning and numerical methods. Provided constructive feedback on Python code.

On-site Manager	CompuMatter	JUN 2020 - SEP 2020

- Communicated with customers to determine their needs and budget.
- Provided customer support, delivering prompt solutions to various technical problems.
- Increased profit margins by over $2000/week.

Landscape Site Manager	Contractor	JUN 2012 - JUN 2020

- In a customer-facing role: planned, organized, and executed garden and lawn beutification projects.
- Masonary work designed and constructed: paver patios, brick steps, hand-formed concrete ramp/landing.

Project: **Maze-Runner AI**	Reinforcement Learning	DEC 2020 - PRESENT

- Designed and developed a maze-runner AI using Q-learning, a reinforcement learning technique, implemented in Python using Numpy array datastructures.
- Discovered method for discouraging backtracking, helping prevent the agent from getting stuck.

Notable Coursework: in my extensive academic background, I've developed a high level of mathematical understanding of, and practical facility with, various machine learning and statistical data analysis methods. Some notable course projects include:

- **Deep Learning CSCI 581** – solved day-of-the-year regression task using global weather data with a custom CNN I wrote; predicted the day of the year within 1.4 days on the dev set. Developed innovative method for reducing data dimensionality by a factor of $\frac{1}{64}$ using statistical summary pooling. Achieved class record for test set performance, this technique could easily be applied to Computer Vision tasks.
- **Computational Linguistics** – utilized BERT NLP word embeddings in a text to visualization to classification transfer learning task, improving performance accuracy over baselines by over 30%.
- Completed Machine Learning Coursera certificates, including **Generative AI with Large Language Models** and **Deep Learning Specialty** which contained a significant amount of Computer Vision tasks.
- Algorithms: Wrote a non-recursive, in-place merge sort algorithm in C++: Parallel_Mergesort.
- Other Notable Courses: Math 543 (**Linear Statistical Models**), Math 510 (**Mathematical Modeling**), Math 527 (**Measure Theory**), CSCI 509 (**Operating System Internals**).
  sethbriney.com/transcripts