

Bryan Gass

GRADUATE COMPUTER SCIENCE STUDENT

P.O. Box 102, South Orleans, MA, 02662, United States

☎ (774)-216-0095 | ✉ Bryank123@live.com | 🏠 beegass.dev | 📺 BeeGass | 🌐 beegassy

Summary

Current full time graduate student at WPI. Interested in applied problems that intersect computer science and intelligent systems.

Work Experience

Nuance Communications | Microsoft

Burlington, Massachusetts

RESEARCH INTERN

June 2022 - Aug. 2022

- Worked on improving performance on multi-GPU training specific to t5 language model applied to medical documents
- Researched problems specific to applying attention to large sequences as well as addressing performance issues that arise from writing styles within medical documentation
 - Worked toward applying state space models to language models
 - Researched attention mechanisms (linear-attention, graph-attention, self-attention) in an effort to finding methods toward increasing context length

Dana-Farber Cancer Institute | Harvard Medical School

Boston, Massachusetts

MACHINE LEARNING INTERN

Jan. 2022 - June 2022

- Worked directly on developing and maintaining the [PathML](#) library
 - Worked on improving the preprocessing pipeline
 - Implemented logging and debugging
- Worked toward increasing resolution of patches used to process whole slide pathology images
 - Researched the application of state space models to aforementioned patches in an effort to leverage long context properties
 - Pre-trained state space models on lower resolutions to few shot larger resolution images
 - Experiments, tests and benchmarks can be found (once publicly available) [here](#)
- Designed and built, using jax/flax, a model zoo, along with an associated preprocessing pipeline and data loader, specific to processing and modeling data associated with whole slide pathology images and radiology data
 - The project can be found (once publicly available) [here](#)

Colgate-Palmolive

Piscataway, New Jersey

DATA SCIENCE INTERN

Jun. 2021 - Dec. 2021

- Researched, developed, visualized and maintained models, using large data sets, that optimized essential strategy for Colgate supply chain
 - Reduced shipping costs, reduced emissions and gave automated alerts to potential problems
- Prepared, preprocessed, and managed large datasets
- Created dependencies to safeguard company data pipelines

Nuance Communications | Microsoft

Burlington, Massachusetts

RESEARCH ENGINEERING INTERN

Jun. 2020 - Aug. 2020

- Worked on the Automatic Speech Recognition (ASR) to aid in work within the mrecutil C++ library

Teledyne Marine Systems

Falmouth, Massachusetts

ENGINEERING AND INFORMATION TECHNOLOGY INTERN

Jun. 2019 - Aug. 2019

- build and managed the platform of operations for various engineering projects
- Assisted in server destruction, construction, subsequent upgrades and creating documentation to help future employees.

Education

Worcester Polytechnic Institute

Worcester, MA, United States

M.S. IN COMPUTER SCIENCE, CONCENTRATION IN MACHINE LEARNING

Aug. 2021 - May. 2022

- Thesis (In partnership with Dana-Farber Cancer Institute): Investigated differences in applying pre-trained sequential models (transformers, S4 and hybrids of both) to whole slide pathology images

Worcester Polytechnic Institute

Worcester, MA, United States

B.S. IN COMPUTER SCIENCE, MINOR IN MATHEMATICS

Aug. 2018 - May. 2021

- Major Qualifying Project: Developed models, trainable on real world incompletely labeled data sets.
 - Research topics were built around positive unlabeled-learning disjunctive concepts in ILP and least general generalization
- Interactive Qualifying Project: Worked with O.R.A.M. to develop and build an app that aids refugees
 - Features of the application were focused toward educating and protecting refugees and/or potential asylum seekers.

- Worked as a tutor in the mathematics department
- Aided students in topics: calculus 1-3 as well as linear algebra

Projects

CS-525, Reinforcement Learning

Worcester, MA

INDIVIDUAL PROJECT

Mar. 2021 - May. 2021

- Implemented a host of algorithms within reinforcement learning (everything from policy evaluation to Deep Q-Networks)

CS-3733, Software Engineering: Mobile/Web App

Worcester, MA

GROUP PROJECT

Mar. 2021 - May. 2021

- CS-3733 Software Engineering in collaboration with Brigham & Women's Hospital. This course had nine person student teams working in a class competition to apply Agile development methodologies and software design patterns in Java to create an indoor pathfinding application, map builder, COVID-screening survey, and integrated service request modules for Brigham & Women's Hospital. The software systems that student teams created were to inform the hospital representatives about potential features, user interfaces, or design approaches that they might consider implementing.
- As a lead software engineer, I helped gather software requirements by survey and interview, creating user stories, scenarios and storyboards. I was responsible for writing the map editor components of the application. Specifically I designed/worked on the pathfinding, zoom/pan and node/edge placement subsystems of the application through the creation of UML use case, class, sequence, and activity diagrams. I was the technical leader of the team.

DS-504, Big Data Analytics: Auto-encoding Variational Bayes

Worcester, MA

INDIVIDUAL PROJECT

Aug. 2021 - Dec. 2021

- Used PyTorch, NumPy and matplotlib to build and test various types of autoencoders, trained on the MNIST dataset.
- Implemented and compared vanilla autoencoder vs. convolutional autoencoder
- Implemented and compared autoencoders vs. variational autoencoder

DS-595, Optimization: Optimization Techniques

Worcester, MA

INDIVIDUAL PROJECT

Aug. 2021 - Dec. 2021

- Used NumPy to build popular first and second order optimizers
- Built gradient descent, mini-batch SGD, single sample SGD, SGD with momentum, AdaGrad, Nesterov's Gradient Acceleration, RMS-Prop, Adam(w), Newton's method and Secant Method

CS-541, Deep Learning: Age Predictor

Worcester, MA

INDIVIDUAL PROJECT

Jan. 2021 - Mar. 2021

- Used Python, NumPy and matplotlib to create an accurate predictor for the age of a person, given a grey scaled image of their face
- The predictor was based off a linear regression model as well as an added L2 regularization term. Mean square error was used to evaluate the cost
- Stochastic gradient descent was used to optimize over the dataset

Iris Dataset Classifier

Worcester, MA

INDIVIDUAL PROJECT

Dec. 2020 - Mar. 2021

- Used Python, NumPy and matplotlib to preprocess data from the iris dataset, build a KNN classifier and visualize the output data
- In an effort to better visualize the output and to decorrelate the variables, principal component analysis was used

CS-4341, Artificial Intelligence: Gomoku

Worcester, MA

GROUP PROJECT/COMPETITION

Aug. 2020 - Nov. 2020

- Used Python and C++ to build an agent that played the game of Gomoku
- The agent used the Min-Max and alpha beta pruning algorithms along with a customized evaluation function to determine score
- The agent was put into a class competition and beat the 8 other teams who participated

CS-4445, Data Mining: Moneyball

Worcester, MA

INDIVIDUAL PROJECT

Oct. 2020 - Dec. 2020

- Used python, pandas and numpy and data pulled from Major League Baseball to create a program that replicated the historical baseball events surrounding Moneyball
- Given both team and player data, cleaning and processing of the data was performed to accurately find the best players in the year 2001
- Similar processing was done to find both best players given a funding threshold within 2001

Keywords

Artificial Intelligence, Machine Learning, Deep Learning, Generative Models, Reinforcement Learning, Computer Vision, Data Mining, Natural Language Processing, Digital Image Processing, Software Engineering, Data Science, Data Analytics, Algorithms, Python, C/C++, Calculus 1-4, Linear Algebra, Differential Equations, Statistics, Probability, TensorFlow, PyTorch, Scikit-Learn, pandas, NumPy, Pandas, Research, Databases, PL/SQL, Oracle SQL, SQL, Java, JavaScript, Object-Oriented Programming