PHUC NGO

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EDUCATION

Beloit College *August 2019 - Present*
Computer Science and Mathematics Major
Cumulative GPA: 4.0/4.0
Presidential Scholarship - $32,000 annually
Beloit College Grant - $10,300 annually
• Introduction to Data Science in Python by *the University of Michigan*
• Applied Plotting, Charting & Data Representation in Python by *the University of Michigan*
• Neural Networks and Deep Learning by *DeepLearning.AI*

RELEVANT COURSEWORK

Calculus I, Calculus II, Computer Architecture, Computer Models & Languages, Discrete Structures, Mathematical Statistics, Intro to Object-Oriented Programming, General Physics I, Linear Algebra, Data Structures and Algorithms, Landscapes: Beauty, Desire and Power, Convolutional Neural Networks for Visual Recognition.

RELATED SKILLS

Key Skills: Machine Learning Algorithms, Deep Learning, Data Visualization, Data Analysis, Data Mining.
Programming Tools: Python, C++, Java, PHP, Javascript, Git.
Packages: Scikit-Learn, Matplotlib, NumPy, Pandas, Jupyter Notebook.
Platform: Linux, Windows, MacOS.
Languages: Vietnamese (Native), English (Full professional proficiency), Chinese (Elementary proficiency).
Others: Familiar with 3D printing, laser cutting, soldering.

ACADEMIC ACHIEVEMENTS

• Ferwerda Merit Scholars: Awards 16 students with academic excellence in natural science.
• Jackson J. Bushnell Mathematics Prize: Recognizes excellence in mathematics during a student's first year.
• First prize in the Informatics contest of Can Tho city for the youth 2019.
• Second prize in the Informatics contest of Can Tho city 2019.
• Consolation prize in the National Olympic in Informatics (top 100) 2018.

EXPERIENCE

Teaching Assistant - Mathematics and Computer Science Department, Beloit College *August 2020 - Present*
• **Courses:** Intro to Object Oriented Programming, Data Structures and Algorithms.
• Organize office hours each week to help students understand programming concepts and approach the projects.
• Create JUnit tests for weekly course projects.

IT Programmer - Information Technology Programmer Department, Beloit College *October 2020 - Present*
• Write automated scripts that process raw student data.
• Manage users in Active Directory and Google servers.

PROJECTS

Data Augmentation Research Project *January 2021 - Present*
• Study the effect of data augmentation on deep representations.
• Trained ResNet18 models on CIFAR-10 dataset with augmentation like grayscale, rotation and adversarial attack.
• Analyze the accuracy, correlation, and nearest neighbor diagram from models' predictions and representations on standard and augmented data.

Leaf Recognition Research Project *January 2021 - Present*
• Attempt to deploy simple machine learning models to classify leaf.
• Preprocess and do feature selection on the dataset.
• Implement and do a deep comparative analysis on machine learning models such as KNN, SVM, ANN.

• Achieve the accuracy of 76.18% with ANN.

Predicting Amphibian Occurrence Research Project *October 2020 - Present*
• Work on the data derived from satellite and natural inventories on amphibian occurrence and sites' attribute.
• Preprocess, analyze, and visualize the dataset.
• Implement machine learning models such as CART, SVM, ANN, kNN with techniques like AdaBoost or stacking to predict the amphibian appearance based on a set of attribute.
• Achieve the peak accuracy of 72% with a really small sample size of 189 instances.

Graph Iterator Research Project *January 2020 - Present*
• Work on building a graph iterator, code module that produces a stream of all possible graphs with specific attributes.
• Derive a bitmanipulation code to exchange row and column of a compressed adjacency matrix.
• Double the speed and performance of executing the task compared to using naive brute force.

The Hasse-Minkowski Theorem Research Project *October 2019 November 2020*
• Explored the applications of the Hasse-Minkowski theorem to homogeneous quadratic forms in two and three vari ables.
• Provided proofs and definitions for the Hasse-Minkowski theorem and relevant theorems using only undergraduate number theory.
• Introduced some complete computer programs implementing the Hasse-Minkowski theorems and Legendre theo rem with some supporting functions like the Eratosthenes sieve.

Meloit *September 2019 - December 2019*
• Developed a wrapper website that constantly crawls all the data from Beloit College's announcing website.
• Displayed the data with a more user-friendly UX/UI to help students navigate and view the news better.
• Received more than 100 positive responses from students to this site.

PUBLICATION

Ngo, P., Dik, M.,*"The Hasse-Minkowski Theorem and Legendre's Theorem for Quadratic Forms In Two And Three Variables"*, Proceedings of International Mathematical Sciences, Volume II Issue 2 (2020), Pages 79-89.

TALKS

International Symposium on Innovation in Information Technology and Application, *A Study on Comparative Analysis of Machine Learning Algorithms Using the Leaf Dataset*, February 2021.
Midstates Consortium Undergraduate Research Symposium, *An Implementation on Hasse-Minkowski and Legendre's Theorems*, Washington University in St. Louis, November 2020.
Sigma Xi Virtual Annual Meeting & Student Research Conference, *The Hasse-Minkowski Theorem and Legendre's Theorem for Quadratic Forms In Two And Three Variables*, November 2020.
Fourth International Conference of Mathematical Sciences, *The Hasse-Minkowski Theorem and Legendre's Theorem for Quadratic Forms In Two And Three Variables*, Maltepe University, June 2020.
Spring Research Symposium, *The Hasse-Minkowski Theorem and Legendre's Theorem for Quadratic Forms In Two And Three Variables*, Beloit College, April 2020.

EXTRACURRICULAR ACTIVITIES

Beloit College Minecraft Server Administrator *November 2020 - Present*
• Get sponsored from the school to maintain a Minecraft server for a year.
• Code and install plugins, mods for the server.
• Manage the player base using database and Discord.
• Use Java and SQL.

Putnam Practice Group *September 2020 - Present*
• Meet weekly to practice solving mathematical problems from the Putnam competition.

MakerLab Advisor *February 2020 - Present*
• Oversee and instruct students how to use the 3D scanner, soldering iron, laser cutter, heat gun, and etc.
• Come up with monthly events, prepare material, and organize the event.

Students Who Code Project *July 2017 - September 2020*
• Founded the first programming organization for high school students in Can Tho City.
• Developed simplified guides on modern languages, such as XML, Python, C++, with many real-life projects and

even mobile applications.
• Introduced programming language to more than 200 students and held five events at school.
• Worked as a program planner, editor, manager and speaker.