PHUC 'JERRY' NGO

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EDUCATION

Beloit College *Beloit, WI*
Computer Science and Mathematics Major August 2019 - Present
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*

RESEARCH

Data Augmentation Research Project - MIT CSAIL *Cambridge, MA*
Massachusetts Institute of Technology Summer Research Program *June 2021 - August 2021*
Mentor: Dr. Aleksander Mądry, Dr. Dimitris Tsipras, Saachi Jain
- Studied the effect of data augmentation on deep representations.
- Trained ResNet18 models on CIFAR-10 dataset with augmentation like grayscale, rotation and adversarial attack.
- Analyzed the accuracy, correlation, and nearest neighbor diagram from models' predictions and representations on standard and augmented data.

Leaf Recognition Research Project - Beloit College *Beloit, WI*
Mentor: Dr. Donghoon Kwon *January 2021 - March 2021*
- Deployed machine learning models to classify leaves.
- Performed a deep comparative analysis on machine learning models such as KNN, SVM, ANN.
- Achieved the accuracy of 76.18% with ANN.

Predicting Amphibian Occurrence Research Project - Beloit College *Beloit, WI*
Mentor: Dr. Eyad Haj Said *October 2020 - January 2021*
- Processed data derived from satellite and natural inventories on amphibian occurrence and sites' attribute.
- Implemented 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.
- Achieved the peak accuracy of 72% with a really small sample size of 189 instances.

Graph Iterator Research Project - Beloit College *Beloit, WI*
Mentor: Dr. Darrah Chavey *January 2020 - Present*
- Build 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 - Beloit College *Beloit, WI*
Mentor: Dr. Mehmet Dik *October 2019 - November 2020*
- Explored the applications of the Hasse-Minkowski theorem to homogeneous quadratic forms.
- Introduced computer programs implementing the Hasse-Minkowski theorems and Legendre theorem with some supporting functions like the Eratosthenes sieve.

PUBLICATION

P. H. Ngo and D. Kwon, "A Study on Comparative Analysis of Machine Learning Algorithms Using the Leaf Dataset," Journal of Industrial Information Technology and Application (JIITA), Vol. 5, Number 4, 2021.

TALKS

Midstates Consortium Undergraduate Research Symposium, *How Data Augmentation Affects What Neural Networks Learn*, November 2021.
IEEE MIT Undergraduate Research Technology Conference, *The Effect Of Data Augmentation on Deep Representations*, October 2021.
MIT Summer Research Program Poster Session, *How Data Augmentation Affects What Neural Networks Learn*,

August 2021.

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.

Spring Research Symposium, *The Hasse-Minkowski Theorem and Legendre's Theorem for Quadratic Forms In Two And Three Variables*, Beloit College, April 2020.

MERITS

- **Google Computer Science Research Mentorship Program** *Recipient* — *September 2021*
- **Ferwerda Merit Scholars** — *June 2021*

Awards 16 students at Beloit College with academic excellence in natural science.

- **Jackson J. Bushnell Mathematics Prize** — *June 2020*

Recognizes excellence in mathematics during a student's first year.

- **First prize in the Informatics contest of Can Tho city for the youth 2019** — *May 2019*
- **Second prize in the Informatics contest of Can Tho city** — *March 2019*
- **Consolation prize in the National Olympic in Informatics** *Top 100, Vietnam* — *January 2018*

EXPERIENCE

Learning Enrichment & Disability Services - Beloit College — *Beloit, WI*
Tutor — *November 2021 - Present*

- Courses: Discrete Structures, Calculus I.

Mathematics and Computer Science Department - Beloit College — *Beloit, WI*
Teaching Assistant — *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.

Information Technology Programmer Department - Beloit College — *Beloit, WI*
IT Programmer — *October 2020 - June 2021*

- Write automated scripts that process raw student data.
- Manage users in Active Directory and Google servers.

RELEVANT COURSEWORK

Computer Science: Algorithm Design & Analysis, Data Structures and Algorithms, Threads & Operating Systems, Computer Architecture, Computer Models & Languages, Intro to Object-Oriented Programming, Database Capstone, Convolutional Neural Networks for Visual Recognition.

Math: Linear Algebra, Mathematical Statistics I, Mathematical Statistics II, Discrete Structures, Vector Calculus, Calculus I, Calculus II, Real Analysis, Abstract Algebra.

Other Courses: Principles of Economics, General Physics I.

RELATED SKILLS

Key Skills: Machine Learning Algorithms, Deep Learning, Data Visualization, Data Analysis, Data Mining.
Programming Tools: Python, C++, Java, PHP, Javascript, Git.
Packages: PyTorch 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.

PERSONAL INTERESTS

MakerLab *President, Supervisor* — *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.

Beloit College Minecraft Server *Administrator* — *November 2020 - Present*

- Get sponsored from the school to maintain a Minecraft server.
- Code and install plugins, mods for the server.
- Manage the player base using database and Discord.

Putnam Practice Group *Member* *September 2020 - June 2021*

- Meet weekly to practice solving mathematical problems from the Putnam competition.

Students Who Code Project *President* *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.