PHUC 'JERRY' NGO

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EDUCATION

Beloit College *Beloit, WI*
Computer Science and Mathematics Major August 2019 - December 2022
GPA: 3.92/4.0

RESEARCH AND WORK EXPERIENCE

MIT McGovern Institute for Brain Research *January 2023 - Present*
Research Technician *Advised by James DiCarlo*
- Benchmark the similarities and differences between ML models and human behavior.

Embodied Intelligence Group @ MIT CSAIL *September 2022 - Present*
Research Assistant *Advised by Yoon Kim*
- Proposed a collaborative project on leveraging in-context learning to improve LLM's lack of grounding.
- Provide Codex, a code generation model, with graphics code examples and assess its effect on the model's visual understanding.

Computer Vision Group @ MIT CSAIL *August 2021 - Present*
Undergraduate Researcher *Advised by Phillip Isola*
- Design a pipeline to test how a large vision-language model, CLIP, performs as a visual system.
- Generate images of optical illusion, shape and color to compute CLIP's response to those stimuli.
- Discover that CLIP is fooled by human optical illusions and that CLIP's understanding of cognitive concepts like color-emotion association or shape language is correlated with human psycho-visual experiments.

Theory of Computation Group @ MIT CSAIL *June 2021 - August 2021*
Undergraduate Researcher *Advised by Aleksander Mądry*
- Researched the effect of data augmentation on deep representations.
- Trained ResNet18 models on CIFAR-10 with augmentation like grayscale, rotation and adversarial attack.
- Discovered that data augmentation is not enough to achieve rotation invariant from standard and augmented representation analysis

Mathematics and Computer Science Department, Beloit College *October 2019 - June 2021*
Research Assistant (2021) *Advised by Donghoon Kwon*
- Performed a deep comparative analysis on machine learning models such as KNN, SVM, ANN using leaf dataset.
- Achieved an accuracy of 76.18% with ANN.

Research Assistant (2019, 2020) *Advised by Darrah Chavey*
- Derived bit-manipulation functions to exchange row and column of a compressed adjacency matrix for a graph iterator program that produces all possible graphs with specific attributes.

Information Technology Department, Beloit College *October 2020 - June 2021*
IT Programmer
- Wrote automated scripts that process raw student data.
- Managed users in Active Directory and Google servers.

PUBLICATIONS

Jerry Ngo, Swami Sankaranarayanan and Phillip Isola, "Is CLIP Fooled by Optical Illusions?"
ICLR TinyPaper 2023 (Invite to Present, 32.8%) [PDF]

PROJECTS

StyleWav: Guiding Image Synthesis Using Audio *2022*
- Coded a pipeline combining CLIP with StyleGAN to generate photos of human faces from voice audio [PDF]

TALKS

Washington University in St. Louis, Midstates Research Symposium In Physical Sciences *November, 2022*
University of Chicago, Midstates Research Symposium In Biological Sciences and Psychology *November, 2022*
MIT, MIT Summer Research Program Poster Session [Poster] *August, 2022*
MIT CSAIL, LLM Summer Working Group *July, 2022*

Beloit College, Annual Student Symposium *April, 2022*
University of Chicago (online), Midstates Research Symposium In Physical Sciences *November, 2021*
MIT (online), IEEE MIT Undergraduate Research Technology Conference *October, 2021*
MIT, MIT Summer Research Program Poster Session [Poster] *August, 2021*
Beloit College, Annual Student Symposium *May, 2021*
Jeju Island (online), ISIITA *February, 2021*
Beloit College, Annual Student Symposium *May, 2020*

AWARDS

Presidential Scholarship: Awards $32,000 annually *2019-2023*
Beloit College Grant: Awards $10,300 annually *2019-2023*
MIT Summer Research Program, *Participant* *2021, 2022*
Ferwerda Merit Scholars: Awards 15 students at Beloit College with academic excellence in STEM *2021, 2022*
Google Computer Science Research Mentorship Program, *Recipient* *2021*
Jackson J. Bushnell Mathematics Prize: Recognizes excellence in mathematics of one freshman *2020*
Consolation Prize in the **Vietnamese National Olympiad in Informatics**, *Top 100* *2018*

TEACHING EXPERIENCE

Learning Enrichment & Disability Services, Beloit College *November 2021 - Present*
Tutor
- Courses: Discrete Structures, Calculus I.
- Host one-on-one tutoring sessions to help students with coursework.

Mathematics and Computer Science Department, Beloit College *August 2020 - December 2021*
Teaching Assistant
- 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.

RELEVANT COURSEWORK

Computer Science: Convolutional Neural Networks for Visual Recognition, Neural Networks and Deep Learning, Algorithm Design & Analysis, Data Structures and Algorithms, Threads & Operating Systems, Computer Architecture, Computer Models & Languages, Computer Network.
Math: Linear Algebra, Mathematical Statistics, Vector Calculus, Real Analysis, Abstract Algebra.
Other Courses: Introduction to Cognitive Science, Principles of Economics.

LEADERSHIP AND COMMUNITY INVOLVEMENT

MakerLab *President, Supervisor* *February 2020 - May 2022*
- Oversee and instruct students how to use the 3D scanner, soldering iron, laser cutter, heat gun, and etc.
- Coordinate and prepare the material for monthly events.

Beloit College Minecraft Server *Administrator* *November 2020 - May 2022*
- Get funded by Beloit College to maintain a school 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.