JERRY NGO

Personal Website ⬦ Google Scholar ⬦ GitHub

ngop@mit.edu

EDUCATION

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

RESEARCH AND WORK EXPERIENCE

McGovern Institute for Brain Research @ MIT BCS *January 2023 - Present*
Research Associate *Advised by James DiCarlo*
- Lead a collaborative project with Google on measuring the alignment between vision language models (VLM) and human behavior.
- Engineer various prompts and conduct inferences on VLMs through API and locally hosted VLMs.
- Design a crowdsourcing pipeline to rapidly collect human responses to psychophysical experiments on MTurk.
- Perform extensive analysis and statistical tests to compare human and machine learning (ML) models' responses.
- Discover VLMs' inability to do simple judgment tasks, unlike humans.

Embodied Intelligence Group @ MIT CSAIL *September 2022 - Present*
Undergraduate Researcher *Advised by Yoon Kim*
- Lead a project on measuring what large language models (LLM) encode in their representation space.
- Extract embeddings from multiple LLMs and audio models on daily objects' names and sounds.
- Trained multi-modalities models to align the extracted audio and language embeddings.
- Discovered that language models encode grounded audio signals in their embeddings. [1]

Vision Group @ MIT CSAIL *August 2021 - December 2022*
Undergraduate Researcher *Advised by Phillip Isola*
- Researched how a large VLM, CLIP, performs as a visual system.
- Generated images of optical illusion, shape, and color to compute the VLM's response to those stimuli.
- Revealed that CLIP is fooled by human optical illusions and that its understanding of cognitive concepts is correlated with human psycho-visual experiments. [2]

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 vision models on augmentations like grayscale, rotation, and adversarial attacks.
- 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
- Conducted a deep comparative analysis of machine learning models for leaf detection task.
- Optimized a graph visualization program for generating attribute-specific graphs.

PUBLICATION

[1] **Jerry Ngo**, Yoon Kim, "What Do Language Models Hear?"
ACL 2024 (Main conference, 20%) [PDF]

[2] **Jerry Ngo**, Swami Sankaranarayanan and Phillip Isola, "Is CLIP Fooled by Optical Illusions?"
ICLR TinyPaper 2023 (Invite to Present, 32%) [PDF]

PROJECTS

StyleWav: Guiding Image Synthesis Using Audio *2022*
- Engineered a system combining CLIP with StyleGAN for generating facial images from voice audio. [PDF]

TALKS

MIT, Second MIT-Google Workshop *January, 2024*
Dartmouth College, New England Computer Vision Workshop *December, 2023*
MIT, MIT CSAIL-LIDS Machine Learning Advances Symposium [Poster] *May, 2023*

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*
Beloit College, Annual Student Symposium	*May, 2020*

SERVICES

Reviewer
- ICML Workshop on LLMs and Cognition *2024*
- ICLR TinyPaper *2024*
- MIT Summer Research Program *2024*

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

MIT Vietnamese Student Association, MIT
Event Coordinator *September 2023 - Present*
- Coordinate monthly events that celebrate Vietnamese culture and foster connections among individuals of Vietnamese descent within the MIT community.

MakerLab, Beloit College
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, Beloit College
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.

Students Who Code, Can Tho, Vietnam

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.