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Ngu Dang

SUMMARY

I am a fifth-year Ph.D. candidate in Computer Science. I am interested in Complexity Theory and Algorithm Designs, particularly the hardness and lower bounds of natural computational problems. During my undergraduate studies, I did some research on Computer Vision. I occasionally did individual machine learning-related projects for personal enrichment.

EDUCATION

Department of Computer Science, Boston University — Boston, MA

Ph.D. in Computer Science — 2020 - 2026 *(expected)*
- Advisor: Prof. Steven Homer
- Research area: Circuit Complexity and The Minimum Circuit Size Problem (MCSP)
- GPA: 3.94/4.00

Department of Computer Science, Clark University — Worcester, MA

B.A. in Computer Science — 2018 - 2020
- Minors: Data Science and Mathematics
- GPA: 3.93/4.00 — Graduated with Summa Cum Laude and High Honors
- First Honors Dean's List in 2018, 2019, and 2020.

PUBLICATIONS

1. Marco Carmosino, **Ngu Dang**, Tim Jackman. Finding Circuit Extensions For XOR in Polynomial Time. 2025. *Symposium On Discrete Algorithms (SODA' 25)*, Under Submission.

2. Mariah Papy, Duncan Calder, **Ngu Dang**, Aidan McLaughlin, Breanna Desrochers, and John Magee. 2019. Simulation of Motor Impairment with "Reversed Angle Mouse" in Head-Controlled Pointer Fitts's Law Task. *In Proceedings of the 21st International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '19); ACM, Pittsburgh, PA, USA.* DOI

TEACHING EXPERIENCE

Teaching Fellow | Boston University — 2021 - present
- CS131: Combinatorics Structures — Summer 2022, 2023
- CS132: Geometric Algorithms — Summer 2022
- CS235: Algebraic Algorithms — Spring 2021
- CS237: Probability in Computing — Summer 2024
- CS332: Theory of Computation — Spring 2023, Fall 2023, 2024
- CS630: Advanced Algorithms — Fall 2021

Grader | Boston University — 2023 - present
- CS535: Complexity Theory — Fall 2023

Undergraduate Teaching Assistant | Clark University — 2018 - 2019
- CS120: Introduction to Computer Science — Fall 2018
- CS121: Data Structures — Spring 2019
- CS180: Automata Theory — Fall 2019

Projects

Edible Mushroom Classifier
. Kaggle's Challenge — Github Link 07.2024 - 08.2024

- Implemented a model classifying edible mushrooms from toxic ones based on their physical characteristics.
- The dataset used in this project (train and test) was generated from a deep learning model trained on the UCI Mushroom dataset. The training set contains 3116945 data points; the test set contains 2077964 data points, with 22 features.
- The model achieved an accuracy score of 0.987 on the hidden test set.

Disaster Tweets Classifier
. Kaggle's Challenge — Github Link 04.2024 - 05.2024

- Implemented a model classifying disastrous Tweets from regular ones in Python using DistilBERT by HuggingFace, which was trained on over 7000 tweets.
- The model achieved an accuracy score of 0.818 on the hidden test set.

Digit Recognizer
. Kaggle's Challenge — Github Link 10.2023 - 11.2023

- Implemented a Digit Recognizer model in Python using a Convolutional Neural Network (CNN), which was trained on the MNIST dataset.
- The model achieved an accuracy score of 0.988 on the hidden test set.

Rwanda Carbon Emission Predictor
. Kaggle's challenge — Github Link 07.2023 - 08.2023

- Implemented a Predictor model for Carbon Emission in Rwanda using Random Forest Regression in Python for a where the data, with a total of 103376 entries, each with 76 features, were taken from approximately 497 unique locations selected from multiple areas in Rwanda during the years 2019, 2020, 2021, and 2022.
- The model achieved an RMSE score of 27.11 on the hidden test set.

House Price Predictor
. Kaggle's Challenge — Github Link 07.2022 - 08.2022

- Implemented a House Price predictor model using CatBoost Regression in Python where the data contains 2919 entries, each with 79 explanatory features describing most aspects of residential homes in Ames, Iowa.
- The model achieved an RMSE score of 0.13 on the hidden test set.

Past Experience

Undergraduate Research Assistant | Worcester, MA 05.2019 - 05.2020
- Contributed to computer vision and computational geometry research projects in the Computer Science Department.
- Implemented experiments, statistical analysis, visualization, and geometrical simulations in Python and Java.

CMS Assistant | Worcester, MA 04.2018 - 08.2018
- Participated in building Clark University's new website on WordPress with the University's Marketing Department.
- Fixed 300 broken links as they were encountered and edited contents as needed.
- Handled tickets from other departments in the university that resolved their problems with accessing new website features.

Awards and Honors

- **Outstanding Academic Achievements**, awarded by the Department of Computer Science at Clark University.
- **Inducted to Phi Beta Kappa**, Lambda of Massachusetts at Clark University on 05.24.2020

SKILLS

Programming: Python, Java, C, C++, MySQL, MATLAB.
Libraries: Pandas, Numpy, Tensorflow, PyTorch, NLTK Toolkit, Scikit-Learn, Seaborn
Tools: Git, Jupyter, Google Colab, Visual Studio, Microsoft Office Suite
Scripting: LaTeX, HTML, CSS
OS: Windows, Linux
Languages: English (fluent), Vietnamese (native).

ACADEMIC
SERVICES

Reviewer for: *Journal of Computer and System Science (JCSS)*
Organizer for: *Boston University Computer Science's Theory Seminar (Spring 2021)*
Vice President for: *Clark University Computer Science's Competitive Programming Club*