Son-Tung Tran

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EDUCATION

Bucknell University, Lewisburg, PA — Expected May 2023
B.A. Mathematics | B.A. Computer Science — Cumulative GPA: **3.59**

Key Courses:
Math: Advanced Linear Algebra | Numerical Analysis | Real Analysis | Abstract Algebra | Statistics for Engineers
Computer Science: Design & Analysis of Algorithm | Image Processing | Programming Languages | Software Engineering and Design | Operating Systems Design

RESEARCH EXPERIENCE

Symmetric Diffeomorphic Registration for Echocardiography Segmentation — Aug - Dec 2021
Bucknell University, Lewisburg PA
Advisor: Dr. Joshua Stough

- Formulized post-processing of echocardiography segmentation as an image registration problem
- Learned and implemented Symmetric Diffeomorphic Registration to fix topology and adjacency errors in output probability map
- Demonstrated a simplistic method using this technique can statistically improve mean Dice scores
- Presented project findings via a technical report to project mentor

Bayesian Optimization of Echocardiography Segmentation — Sep 2019 - May 2021
Bucknell University, Lewisburg PA
Advisor: Dr. Joshua Stough

- Collaborated with Geisinger's healthcare experts to optimize an echocardiography segmentation model
- Utilized asynchronous, noise-tolerant Bayesian Optimization to optimize hyperparameters of a convolutional neural network on 20+ computing nodes
- Achieved smaller biases and limits of agreement that are narrower than inter-observer variability with reported clinical indices, outperforming the current state-of-the-art on CAMUS dataset and generalizable to the independent EchoNet-Dynamic dataset
- Submitted an accepted paper to the IEEE International Symposium on Biomedical Imaging 2021 and presented in a remote poster session

PUBLICATIONS

Tran, Son-Tung, Stough, Joshua V., Zhang, Xiaoyan, Haggerty, Christopher M., (2021). *Bayesian Optimization of 2D Echocardiography Segmentation*. IEEE International Symposium on Biomedical Imaging (ISBI), 2021 (4-page paper)

Technical Report:
Tran, Son-Tung, Stough, Joshua V., "Symmetric Diffeomorphic Registration as A Post-Processing Method for Echocardiography Segmentation (technical report)

PRESENTATIONS

Tran, Son-Tung, Stough, Joshua V., Zhang, Xiaoyan, Haggerty, Christopher M.. (2021, April 6). *Bayesian Optimization of 2D Echocardiography Segmentation.* Poster presented at the IEEE International Symposium on Biomedical Imaging 2021, Nice, France (Remote).

Tran, Son-Tung, Stough, Joshua V., Zhang, Xiaoyan, Haggerty, Christopher M.. (2021, July 28). *Bayesian Optimization of 2D Echocardiography Segmentation.* Video presented at the Annual Susquehanna Valley Undergraduate Research Symposium 2021.

Tran, Son-Tung, Stough, Joshua V., Zhang, Xiaoyan, Haggerty, Christopher M.. (2022, April 19). *Bayesian Optimization of Echocardiography Segmentation.* Poster presented at the Annual Kalman Research Symposium 2022.

AWARDS and GRANTS

Bucknell Program for Undergraduate Research, Bucknell University Summer 2021

- Awarded to Bucknell Students based on a competitive review of submitted research proposals to conduct collaborative hands-on summer research projects

Ciffolillo Healthcare Technology Inventors Program, Bucknell University Summer 2020

- Awarded to undergraduate students to work with faculty and external healthcare experts on healthcare technology development efforts

Dean's List, Bucknell University Spring 2022/Fall 2021/Fall 2020

- Awarded to any student with a 3.5 GPA or higher for a semester with at least 3 credits

5th rank, International Collegiate Programming Contest Mid-Atlantic Regional @ Wilkes University Fall 2019

WORK EXPERIENCE

Dr. Stough's Medical Imaging Lab, Student Researcher Sep 2019 – Dec 2021

- Responsible for maintaining the lab's workspace
- Engineered a server that sends out optimization requests effectively, resulting in an accepted paper

Data Structures & Algorithms, Teaching Assistant Jan - May 2020

- Gave strategic advice and facilitated active learning for students in lab sessions
- Assessed performance of 72 students, graded assignments, and gave out comments on improvement
- Communicated with the course's professor to report the students' progress and feedback to better adjust the pace of the course

IEE International English Academy, SAT Math Tutor Jun - Aug 2019

- Organized weekly schedule of 90-minute studying sessions
- Assessed and give academic advice and followed up after each session to improve the progress in the course

CAMPUS INVOLVEMENT and LEADERSHIP EXPERIENCE

Machine Learning Association, *Founder* Nov 2021 - Present

- Led bi-weekly meetings, worked directly with department faculty, and engaged with machine learning experts to plan speaker events
- Organized hands-on machine learning hackathons for beginners

Badminton Club at Bucknell, *Secretary* Sep 2022 – Present

- Led weekly training and organized badminton competitions for 15 members of the club
- Take notes and facilitate discussions during executive meetings

Vietnamese Student Association at Bucknell, *Treasurer* Fall 2020 - May 2021

- Secured funding for Vietnamese and collaborative cultural events for ~30 members

PROJECTS

Reproduce baselines of Proof Artifact Co-training for Theorem Proving with Language Models Spring 2022

- Achieved results close to the paper during training (validation loss of 1.60 vs. 1.59)
- Reported and displayed the results through WandB

Python to LaTeX Spring 2022

- Developed a website to help convert Python functions to pseudo-code in LaTeX using Javascript
- Designed the website using HTML, CSS, and Javascript

Distributed optimizer Fall 2021

- Wrote a Python package for optimizing models asynchronously over computing nodes in the same LAN network

SKILLS and INTERESTS

Skills:

Research Tools: Jupyter Notebook & Python visualization | PyTorch | LaTeX | WandB

Programming Languages: Python | C++ | Lean (functional metaprogramming language) | Matlab

Interests: Fiction | Philosophy | Badminton