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Tu Anh-Nguyen

Interests

Operations Research, Discrete Optimization, Polyhedral Theory
Mixed-Integer/Stochastic Programming, Graph Theory, Machine Learning

Education

2020 – Present	**Rice University**, *Department of Computational Applied Mathematics and Operations Research*. Master/PhD Track, Operations Research GPA: 4.0/4.0 **Advisor**: Dr. Joey Huchette – `https://www.joehuchette.com/`
2015 – 2020	**Hanoi University of Science and Technology**, *School of Applied Mathematics and Informatics*. Bachelor of Engineering, Applied Mathematics, Talented Program. GPA: 3.64/4.00
2011 – 2014	**Vietnam National University - High School for Gifted Students**, *Mathematics Program*. High School Diploma.

Academic Experience

Aug 2022 – Present	**Teaching Assistant**, *CMOR 378: Intro to Optimization & Operations Research*, Houston, TX. Host office hours weekly, write homework/exams and grade assignments.
2020 – Present	**Research Assistant**, *Rice University CMOR Department*, Houston, TX. Conduct research on mixed-integer programming formulation and IP-value function approximation using deep neural networks.
Jun 2019 – Sep 2019	**Research Intern**, *RIKEN Center for Advanced Intelligence Project*, Tokyo, Japan. Research on Communities Detection on Link Stream at the Language Information Access Technology Team.
Jun 2017 – May 2020	**Student Research Assistant**, *School of Applied Mathematics and Informatics*, Hanoi, Vietnam. Research on graph theory. Our result shows that the dominating set problem is polynomial in (fork, Z_2)-free graphs. Our research was published at the International Conference on Combinatorics, Graph Theory and Applications on April $15^{th} - 17^{th}, 2018$, Hanoi, Vietnam.

Publications

Conference	**CDC 2022** ○ *On Distributed Exact Sparse Linear Regression over Networks*, <u>Tu Anh-Nguyen</u> and César A. Uribe, In Proceedings of the 61st IEEE Conference on Decision and Control - December $6^{th} - 9^{th}$, 2022, in Cancun, Mexico. CoRR:2204.00529.
	ICGTA 2019 ○ *Minimum Dominating Set Problems in* (fork, $\overline{P_5}$)-*free and* (claw, P_5)-*free Graphs*, <u>Tu Anh-Nguyen</u> and Ngoc C. Le, International Conference on Combinatorics, Graph Theory and Applications, April $15^{th} - 17^{th}, 2018$, in Hanoi, Vietnam.
Workshop	**MIP 2022** ○ *Neural Network Verification as Piecewise Linear Optimization*, <u>Tu Anh-Nguyen</u> and Joey Huchette, Mixed Integer Programming Workshop - May $23^{th} - 26^{th}$, 2022, DIMACS, Rutgers University. Poster: `https://tu-na.org/assets/pdf/mipsw22.pdf`
Preprint	○ *Neural Network Verification as Piecewise Linear Optimization: A Composition of Staircase Function Formulation*, <u>Tu Anh-Nguyen</u> and Joey Huchette, Submitted to Operations Research. CoRR:4620383.
	○ *Community Detection in Link Stream*, <u>Tu Anh-Nguyen</u>, Tiphaine Viard, and Takanori Maehara.

Awards and Scholarships

2020 – 2025	**Rice University Graduate Fellowship**.

2017 – 2019	**Hanoi University of Science and Technology Scholarship for Outstanding Students**. Selected 100 from 30,000 students. Awarded 2 times: 2017-2018 and 2018-2019.
2016 – 2019	**National Program: Development of Mathematics Scholarship**. Selected students who have exceptional performance in Mathematics in all Vietnamese universities. Awared 3 times: 2016-2017, 2017-2018, and 2018-2019.
Apr 2018	**Travel award**, *Workshop on Graph Theory of ICCGTA 2018*, Hanoi, Vietnam.
Apr 2017	**1st prize in Algebra**, *25thNational Mathematical Olympiad for University Students*.
Jan 2017	**1st prize**, *Hanoi University of Science and Technology Mathematical Competition*.
Apr 2016	**2nd prize in Algebra**, *24thNational Mathematical Olympiad for University Students*.
Jan 2016	**1st prize**, *Hanoi University of Science and Technology Mathematical Competition*.
Mar 2014	**Runner-up prize**, *Hanoi National University, High School Annual Research Conference*. On Extending Melenaus' Cutting Line Theorem.

Work Experience

Jan 2019 – Jun 2019	**Machine Learning Engineer Intern**, *ITSOL*, Hanoi, Vietnam. Built machine learning POC applications for curriculum vitae information extraction and recommendation systems matching potential candidates with an employer using two-twoers embeddings and Bi-LSTM models.
Jan 2018 – Jan 2019	**Machine Learning Engineer Intern**, *Websosanh.vn*, Hanoi, Vietnam. Built neural networks for e-commerce applications. Designed system to classify products based on names. Used Doc2Vec to obtain high-quality product name vectors leading to an increase in accuracy from 85% to 90%.
Jan 2017 – August 2017	**Application Development Intern**, *Skymap Global*, Hanoi, Vietnam. Software product tester. Joined in building mobile application that supports sale manager to keep track of their customers' information.

Programming Languages and Frameworks

Programming	**Python, Julia, MATLAB, C++**	*11 projects and 2 intern projects*
Framework	**Gurobi, PyTorch, JuMP, Scikit-Learn, TensorFlow**	*4 projects and 2 intern projects*

Other Activities

2022 - 2023	**SIAM Rice University CMOR Chapter Vice President**
Oct 2022	**Rice Graduate Student Seminar** On Distributed Exact Linear Regression over Networks
Sep 2021	**Rice Graduate Student Seminar** Neural Network as Piecewise Linear Function
2020 - 2021	**Graduate Student Association Representative** for the Department of Computational and Applied Mathematics, Rice University
Jan 2020	**Graph Theory Seminar** at VIASM. Presentation title: Minimum Dominating Set in some classes of graphs
Dec 2019	**Combinatorics Mathematics Seminar** at School of Applied Mathematics and Informatics. Presentation title: Iterative Method on Submodular Maximization
Oct 2019	**Graph Theory Seminar** at School of Applied Mathematics and Informatics. Presentation title: Approximating Minimum Dominating Set
Oct 2018	**Graph Theory Seminar** at School of Applied Mathematics and Informatics. Presentation title: Review on Independent Set Problem
Apr 2018	**Student Volunteer** for organizing the IGCCTA 2018 conference
Aug 2017	**Graph Theory Seminar** at School of Applied Mathematics and Informatics. Presentation title: Graph Modular Decomposition and Clique Separation
Mar 2017	**Annual SAMI Science Conference**. Presentation title: On Independent Set Problem and Chordal Graph Properties