

## DUC TOAN NGUYEN

duc.toan.nguyen@tcu.edu | [ductoanng.com](http://ductoanng.com) | 3145 Cockrell Ave, Fort Worth, TX 76109 | (682) 408-9409

### EDUCATION

#### TEXAS CHRISTIAN UNIVERSITY

Fort Worth, Texas

#### College of Science and Engineering

Sep 2021 - May 2025

#### John V. Roach Honors College

Bachelor of Science in Mathematics

Current GPA: 4.0/4.0

Bachelor of Science in Computer Science

### RESEARCH EXPERIENCE

#### TCU Department of Mathematics

Fort Worth, Texas

#### *Geodesic Nets Construction*

Sep 2022-Present

- Learn some properties of Geodesic Nets on Euclidean Space and other surfaces
- Investigate some small and basic geodesic nets with 4 to 5 balanced vertices on the flat torus using Genetic Algorithm
- Find a method to construct a Geodesic Net inspired from Steiner Tree using Fermat-Torricelli points

### ACADEMIC PUBLICATION

- Nguyen, Duc Toan. "[Anti-Steiner Point Revisited](#)." *Mathematical Reflections*, no. 6, 2020.
- Nguyen, Duc Toan. "Problems with two tangent homothetic circles." *The mathematical solving methods through Olympiads*, 2019.
- Nguyen, Duc Toan and Van Thanh Son Nguyen. "Solution for Problems from Entrance Exam to Le Quy Don High School For The Gifted, Da Nang city, Vietnam, in 2019." *Vnexpress.net*, June 5, 2019.

### POSTERS/PRESENTATION

- Nguyen, Duc Toan. "Geodesic Nets construction using Genetic Algorithm." *Student Research Symposium (SRS)*, Texas Christian University, April 2023 (poster).

### WORK EXPERIENCE

#### TCU Department of Computer Science

Fort Worth, Texas

#### *Research Assistant*

January 2023-Present

- Analyzed the structure and performance of AlphaGo against human players
- Learned key machine learning concepts such as Reinforcement Learning, Monte Carlo Search Tree, CNNs
- Contributed to development of a new game-playing algorithm that outperformed existing methods

#### TRIO Program - TCU College of Education

Fort Worth, Texas

#### *SSS Peer Tutor*

January 2022-Present

- Support lower-income and first-generation students with their academic path
- Teach students to think critically and how to deal with complicated Math problems
- Inspire students with the language of math and efficient coding

#### TCU Department of Mathematics

Fort Worth, Texas

#### *Math Grader/Teaching Assistant*

January 2022-Present

- Grade student's homework assignments and give them detailed feedback
- Discuss with Professor some problems in grading and other mathematical topics
- Review foundational topics to create a strong math base for future research

### RELEVANT COURSES

- **Mathematics Courses:** Applied Linear Algebra, Applied Differential Geometry, Geometric PDEs, Real Analysis I, Abstract Algebra I, Multivariable Analysis, Statistics, Topology, Numerical Analysis
- **Computer Science Courses:** Data Structures, Artificial Intelligence, Intro to Data Science, Deep Learning, Database Systems, UNIX/Linux Admin, Analysis of Algorithms

### TECHNICAL SKILLS

*Programming languages:* Python, Java, R, Matlab, C++, HTML, JS, PHP, Octave

*Operating Systems:* Linux, MacOS, Windows

**HONORS/AWARDS**

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TCU Student Research Symposium Best Undergraduate Poster Presentation Finalist 2023

Top 500 in the 83rd William Lowell Putnam Mathematical Competition 2022

First prize in TCU Math Department Calculus Bee 2022 and 2023

Third prize in Vietnam Mathematical Olympiad in 2019

TCU Scholar (GPA 4.0)

**MEMBERSHIP**

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Pi Mu Epsilon - TCU Texas Alpha chapter