KHANG VO HUYNH

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EDUCATION

Doctor of Philosophy in Computer Science, University of Virginia, Charlottesville, VA August 2023 - Present

Bachelor of Arts, St. Olaf College, Northfield, MN Graduation: May 2023

Majors: Computer Science and Mathematics
Concentration: Statistics and Data Science
Cumulative GPA: 3.86/4.00 | Computer Science GPA: 3.94/4.00 | Mathematics GPA: 4.00/4.00

Coursework:

Computer Science: Artificial Intelligence, Algorithms/Data Structures, Senior Capstone, Mobile Computing Application, Principles of Computer Science, Software Design, Hardware Design, Ethical Issues in Software Design
Mathematics: Abstract Algebra II (Spring 2023), Mathematics Practicum, Advanced Linear Algebra, Probability Theory, Differential Equations I, Real Analysis I, Abstract Algebra I, Multivariable Calculus, Elementary Linear Algebra
Statistics and Data Science: Statistical Modeling (Spring 2023), Algorithms for Decision Making (Fall 2022), Statistics for Science (Fall 2022), Introduction to Data Science

VNU-HCM High School for the Gifted, Ho Chi Minh City, Vietnam Graduation: May 2019

Major: Physics
GPA: 9.1/10 (12th grade)

SKILLS

Robotics: ROS2
Programming languages: Python, C++/ C, Shell Scripting, assembly language, R, some MATLAB
Cloud-based technologies: Kubernetes, Docker, AWS, GKE
Artificial intelligence techniques: machine learning, deep learning
Others: some computer vision, some natural language processing

PUBLICATIONS

Paul D. Humke, **Khang Vo Huynh** and Thong Vo, "Efficiently Filling Space," *Rocky Mountain Journal of Mathematics* (accepted for publication in June 2022).

- Constructed a proof that there is a space-filling curve, $f : [0, 1] \rightarrow [0, 1]^n$ that is at most n+1-to-1 at every point.

Paul D. Humke, and **Khang Vo Huynh,** "Finding Keys to the Peano Curve," *Acta Mathematica Hungarica* (published on 5th June, 2022)

- Presented Hilbert's geometry and used it to show the Peano Curve is at most 4-to-1 but never 3-to-1.
- Established a complete arithmetization of Peano Curve based on Hilbert's method.

Other Research Experience

Undergraduate Researcher, Dr. Elizabeth Jensen, Computer Science Dept., St. Olaf College June 2022 - present
Multi-Robot Communication and Exploration

- Construct a communication network among TurtleBot3 Burgers and Waffles as well as Pi Zero Ws using B.A.T.M.A.N IV routing algorithm
- Collect and analyze network disruptions data based on transmit quality (TQ) and round-trip time (RTT) between nodes in the network
- Identify situations in which physical obstacles are main source of networking inference
- Build a behavior model for the Robot using Ros2 Foxy, C++, and networking tools in order for the robot to avoid disconnectivity and/or regain connection as needed while exploring unknown area

Undergraduate Researcher, Dr. Richard Brown, Computer Science Dept., St. Olaf College June 2021 - present
Cloud-powered PDC Computations For a Runestone Interactive Textbook

- Lead a team of peers to build a backend for an interactive Runestone textbook on parallel and distributed computing (PDC) for beginning undergraduate students in which a reader can enter, modify and run computer code
- Create a way for PDC computations to take place within a Runestone book, which makes learning PDC convenient enough for beginners
- Construct the backend using cloud computing, Docker containers and Kubernetes management system
- Organize and execute tasks such as OpenMP, OpenACC, MPI, etc. on Google Kubernetes Engine

Center for Interdisciplinary Research Fellow, Dr. Jaime Davila and Dr. Douglass Beussman August 2022 - present
Human Scent Research

- Utilize statistics analysis, like principal component analysis or Spearman correlation factors, to classify human scent profiles

Capstone Research Project, Dr. Olaf Hall-Holt, Computer Science Dept., St. Olaf College February 2022 - May 2022
Using Computer Vision to Teach Number Lines in Classroom

- Built application using computer vision and machine learning that can help the process of learning counting and mathematics through number lines for children in Ghana and locally in Northfield
- Constructed a workflow that included Canny edge algorithm, line segment detection, and mark detection so that the application could, via a photo and/or video, detect the number that a student was pointing at on a number line.

Mathematics Practicum Researcher, Medtronic (client) January 2022
Research on Multi Label Text Classification on Imbalanced Data

- Conducted research on multi label text classification problem especially on skewed large dataset
- Implemented BERT, random forest, one versus rest classification, etc. to benchmark the result

Independent Researcher, Dr. Paul D. Humke, Mathematics Dept., St. Olaf College June 2021 - December 2021
Generalized Klein-4 Groups Generate Peano Curves in R^n

- Constructed an inductive definition and define Peano Curve in n-dimension based on the result obtained from the previous research project "Finding the Keys to Peano Curve"
- Established a generalized version of the Klein-4 group that generates the Peano Curve in n-dimension

The manuscript is under preparation for submission for publication.

Summer Researcher, Dr. Richard Brown, Computer Science Dept., St. Olaf College June 2021 - August 2021
Self-organizing Raspberry Pi Cluster

- Built image/operating system for Raspberry Pi 4Gbs using PiGen with an aim for building a cluster that has the capability of doing parallel and distributed computing
- Prepared and supported CSinParallel Workshop: Virtual Summer 2021 Workshop

Presentations and Posters

Utilizing Awareness of Surroundings to Reduce Network Disruption while Maximizing Coverage in Multi-Robot Exploration. Midstates Consortium 2022 Undergraduate Research Symposium in the Physical Sciences, Mathematics and Computer Science, Washington University at St. Louis, November 11-13th, 2022. (oral presentation)

Cloud-powered PDC Computation for a Runestone interactive Textbook. Midstates Consortium 2022 Undergraduate Research Symposium in the Physical Sciences, Mathematics and Computer Science, Washington University at St. Louis, November 11-13th, 2022. (poster presentation)

Utilizing Awareness of Surroundings to Reduce Network Disruption while Maximizing Coverage in Multi-Robot Exploration. Collaborative Undergraduate Research and Inquiry Closing Symposium, St. Olaf College, July 2022 (poster presentation)

Cloud-powered PDC Computations For a Runestone Interactive Textbook, Collaborative Undergraduate Research and Inquiry Closing Symposium, St. Olaf College, July 2021 (poster presentation)

Finding the Keys to the Peano Curve, Mathematics on the Northern Plain Undergraduate Conference, University of Sioux Falls, April 2021 (virtual oral presentation)

Technology-related Jobs/ Internships

Lead cluster manager, Computer Science Dept., St. Olaf College February 2022 - present

- Leading a team to develop a cloud-native infrastructure for applications such as gitlab, Jupyter notebook, etc.
- Assume primary responsibility when unexpected networking or system disruption occurs in the computer science department

Cluster Manager, Computer Science Dept., St. Olaf College September 2021 - February 2022

- Worked on developing cloud-native infrastructure for applications including Jupyter notebook, TensorFlow, etc.
- Constructed and maintained a local Kubernetes cluster using three high performance machines
- Mentored and directed peer on using Kubernetes and Docker to containerize applications

Website Development Intern, KIS Vietnam Creative, Ho Chi Minh City, Vietnam March - July 2019

- Utilized HTML to develop a website in collaboration with a group of professional programmers

- Collaborated with three software developers on the debugging team to generate testing scenarios and report to the development team

Teaching Experience

Teaching Assistant, Computer Science Dept., St. Olaf College

- Foundations of Artificial Intelligence (CS 379) — September 2022 - present
- Probability Theory (MATH 262) — September 2022 - present
- Analysis of Algorithms (CS 353) — February 2022 - May 2022
- Hardware Design (CS241) — September 2021 - December 2021

Awards

Pi Mu Epsilon, Mathematics Honor Society — Spring 2020-2021, Spring 2021 - 2022
Dean's List, St. Olaf College — 2020 - 2021, 2021 - 2022

Extracurricular Activities

Coding Sub-Team Member, St. Olaf – Carleton Engineering Team — October 2019 - present

- Collaborate with a group of Carleton College and St. Olaf College students to build a drone to compete in national and local robotics competitions
- Develop an algorithm for the movement of the drone including GPS, computer vision, sensors, etc.

Member, Algorithms Club, St. Olaf College — September 2020 - present

- Work on Leetcode exercises and prepare for technical interview

Certifications

Responsible Conduct of Research (RCR) Training (with Peer Review and Conflict of Interest modules) — June 2nd, 2021
Machine Learning (Coursera) — November 17th, 2021