TYLER Y. KIM

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Current Address:
Fairfax, VA, 22030

Education

University of Texas at Austin, Austin, TX
Masters of Artificial Intelligence, Expected May 2027

University of Virginia, Charlottesville, VA
Current GPA: 3.9/4.0
Bachelor of Science in Computer Science, May 2025
Minor in Data Science, May 2025

Carnegie Mellon University, Pittsburg, PA
Principles of Computing, Summer 2020

Trinity Christian School, Fairfax, VA
Summa Cum Laude*, May 2020*

Virginia Summer Residential Governor's School for Math, Science and Technology, Lynchburg, VA
Cryptography, July 2019

Work Experience and Internships

Interned as a Data Scientist at the National-Geospatial Intelligence Agency, Summer 2023, Summer 2024

- Modernized application with python and docker containerization (June 5th - August 11th)
  - Full-time intern working 40 hours per week
  - Used python, pandas, and numpy to aggregate data into a uniform format
  - Learned data aggregation techniques and python tools
- Created isolated docker container of pgadmin4 for openshift environment (June 3rd - August 9th)
  - Full-time intern working 40 hours per week
  - Used docker and pgadmin4 source code to to create image
  - Learned containerization, databases, common security vulnerabilities, and basics on how an operating system works
- SMART Scholar

UVA Teacher's Assistant for CS 3120: Discrete Math and Theory 2, Spring 2024
Professor Mark Floryan, PhD

- Held office hours for three hours per week
- Graded homework assignments and quizzes

UVA Teacher's Assistant for CS 4774: Machine Learning, Fall 2024
Professor Rich Nguyen, PhD

- 6 hours per week

- 3 hours holding office hours for students
- 3 hours for grading work

Research

Using Diffusion Models as a Digital Twin for Physics Based Application, Fall 2024 to Present
Professor Geoffrey Fox, PhD

- Meetings weekly on Fridays
- Literature reviews on diffusion models
- Developed variational and masked autoencoder using Pytorch
- Documented and analyzed code from various papers.
    - Used python to analyze a diffusion model that unfolded particle physics data from particle accelerators
    - Wrote documentation using markdown explaining the code from the paper

Using Deep Learning for Multi-Messenger Astronomy, Fall 2023 to Spring 2024
Professor Geoffrey Fox, PhD

- Using deep learning in order to compute data from electromagnetic waves
- Primarily did literature reviews for research project
    - searched for datasets collected from astronomical surveys
    - organized list of algorithms, datasets, and bands according to paper in an excel sheet

Using Swarm Optimization Algorithms for Explainable AI, Spring 2023 to Spring 2025
Amirreza Fathkouhi

- Focusing on using swarm optimization algorithms such as PSO, Bat, and similar algorithms to better optimize LIME algorithm
- Developed code that compared optimization approach to different explainable AI algorithms such as LIME, Kernel Shap, Spearman Correlation, and Tree Shap
    - used python and various libraries such as pandas, numpy, sklearn, swarmpackagepy, and matplotlib
    - used data from OpenML

Single-cell RNA Sequencing and Artificial Neural Networks, Fall 2021 to Spring 2022
Professor Hehuang "David" Xie, PhD

- Discovering different features of genes using their gene expressions
- Created basic neural network using Tensorflow and R that took in gene expressions as input

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Distinguishing Scholarships

SMART Scholar, Science, Mathematics, and Research for Transformation, Department of Defense (2022)
Rodman Scholar, University of Virginia

Skills

Java, Python, C/C++, R, SQL, Pandas, Numpy, Tensorflow, Pytorch, ROS, MVSim, Docker, Kernel Development, OpenShift, IntelliJ, Eclipse, MySQL, Octave, Linux, Computer Vision (CNNs and object detection), Reinforcement Learning, NLP (RNN), Git, Gradle, Quartus II, Markdown, Latex, OpenAI Gymnasium

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Certificates

(Coursera) Machine Learning Course Certificate, May 2022
(Coursera) Neural Networks and Deep Learning Certificate, June 2022
(Coursera) Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization, June 2022
(Coursera) Structuring Machine Learning Projects, June 2022
(Coursera) Neural Networks and Deep learning, June 2022
(Coursera) Convolutional Neural Networks, August 2022
(Coursera) Deep Learning Specialization Certificate of Completion
https://www.credly.com/badges/d5f94b56-52fd-456b-9e90-3f265d76b748/public_url

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Leadership

Executive in UVA Machine Learning Club, Spring 2022 to Spring 2023
First-Year Representative for RodCouncil, Fall 2021 to Spring 2022
Scrum Master for CS 3240 Project, Spring 2023

Selected Projects

Minimally Invasive Path Deconfliction for Non-Communicative Robots - Multi-Robot Navigation Course Project (Spring 2025)

- Goal was to use diffusion models to avoid robot collision
- Used python, ROS, and MVSim
- Implemented Optimal Reciprocal Collision Avoidance (ORCA) algorithm with Python for two robots entering through a small corridor

Cops and Robots - AI and Robotics course project (Fall 2024)

- Goal was to simulate robots to reach a goal without getting detected from actors
- Used gymnasium as a simulation environment in python
- Used reinforcement learning for training
- The algorithm used was Proximal Policy Optimization (PPO) Algorithm

ML4VA - Machine Learning for Virginia Drought Detection Project (Fall 2023)

- Group Project for machine learning class
- Predicted severity of drought in Virginia using machine learning techniques using time series data
- Role was data preprocessing and visualization and initial algorithm

MNIST Dataset using Neural Network from Scratch (June – August 2022)

- Trained model to predict digits based on handwriting
- Created artificial neural network using only numpy

Foreign Languages
Latin - took classes in High School

Activities & Volunteering
President and Executive Board Member, University of Virginia Machine Learning Club
Rodman First-Year Representative, University of Virginia
Member, Polytechnic Institute of Virginia Research Program, Machine Learning and Gene Expression
Participant, University of Virginia Computer Network Security Club
Competitor, University of Virginia Collegiate Penetration Testing Competition
Competitor, Kaggle

- Titanic; use machine learning to predict which passengers survived the Titanic shipwreck
- Petals to the Metal; use machine learning identify types of flowers from images
- MNIST; use machine learning to identify digits from handwritten images

Personal Projects:

- Recognizing handwritten digits with a neural network from scratch (no Tensorflow)

Cyber Patriot XIII (2020-2021)
Cyber Patriot XII Competition (2019)
American Computer Science League Competition (2019-2020)
Color Guard (2018-2021)
Marine Advanced Technology Education (2018)
FIRST Tech Challenge Robotics (2015-2020)
FIRST Lego League (2014-2015)
Java Class Instructor for First Tech Challenge Team
FIRST Global Challenge Field Re-setter
FIRST Tech Challenge Field Re-setter
Naval STEM Exposition – Robotics Outreach
Lucky Dog Animal Rescue
Nova Play Labs Summer Camps – STEM Outreach

Leadership
Captain, Trinity Christian School Varsity Baseball (2021)
Peer Mentor, Trinity Christian School (2020-2021)
Chief Operating Officer, FIRST Tech Challenge Robotics Team (2019-2020)
Project Manager and Lead Java Programmer, FIRST Tech Challenge Robotics Team (2018-2019)
Lead Java Programmer, FIRST Tech Challenge Robotics Team (2017-2018)

Honors, Awards, and Certificates
Trinity Christian School Physical Science Department Honor Graduate (2021)
Delaney All Conference First Team All Conference in Varsity Baseball (2021)
Certificate in Python, Intro to Machine Learning, Intermediate Machine Learning, Data Visualization, and Pandas
CyberPatriot XIII – Placed top 16% Platinum (Highest Division) State Competition (January 2021)
Color Guard – Promoted to Corporal (2020-2021)
Northern Virginia Travel Baseball League Columbus Day Tournament Champions (November 2020)
Trinity Christian School Science Department Award (May 2020)
American Computer Science League All Stars (May 2020)
FIRST Tech Challenge 2020 World Championship (March 2020)

Honors, Awards, and Certificates *Continued*

FIRST Tech Challenge 2019-2020 Maryland-DC Championship Tournament Winning Alliance (March 2020)
FIRST Tech Challenge Motivate Award (January 2020)
FIRST Tech Challenge Inspire Award – Second Place (January 2020)
FIRST Tech Challenge Collins Aerospace Innovate Award Second Place (January 2020)
FIRST Tech Challenge Design Award – Third Place (January 2020)
FIRST Tech Challenge Think Award – Third Place (January 2020)
Rockwell Collins Innovate Award (January 2020)
Certificate of Commendation for Participating in the Virginia Summer Residential Governor's School for Math, Science and Technology (2019)
Trinity Christian School Christian Studies Department Award (May 2019)
Cyber Patriot XII Semi-Finalist (December 2019)
FIRST Tech Challenge Dean's List Semi-Finalist (2019)
FIRST Tech Challenge Control Award (Third Place 2019)
FIRST Tech Challenge Think Award (Third Place (2019)
FIRST Tech Challenge State Championship Tournament (2019)
FIRST Tech Challenge Winning Captain Alliance (2019)
FIRST Tech Challenge Think Award (2018)
Trinity Christian School Outstanding Bandsman Award (May 2018)
Certificate of Honorable Merit Magna Cum Laude (2018)
FIRST Tech Challenge Connect Award (2017)
FIRST Tech Challenge Control Award (2017)
Thomas Jefferson Intermediate Math Open (Third Place Team, 2017)
Trinity Christian School History Department Award (May 2016)
FIRST Tech Challenge Think Award (2016)
FIRST Tech Challenge Winning Alliance Captain (2016)
FIRST Tech Challenge Connect Award (2015)
FIRST Tech Challenge Super-Regional Championship Tournament (2015)
Trinity Christian School Sportsmanship Award (June 2015)
Trinity Christian School Leonardo Da Vinci Award (June 2014)

References furnished upon request.