Quang **Truong**

Computer Science · Research Assistant

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Research Interests

Computer Vision, Image Processing, Pattern Recognition, Machine Learning.

Education

Texas Christian University

Fort Worth, Texas

B.S. in Computer Science, Minor in Mathematics — *January. 2019 - Exp. May. 2022*

- Bronze Medal - Ranked 12/60 in ACM-ICPC 2019 South Central USA Regional Contest.
- Transfer Faculty Scholarship (Full-tuition Scholarship).
- TCU Scholar (Spring 2020).
- Dean's List (Fall 2019, Spring 2020).
- GPA: 3.88/4.0

Mississippi State University

Mississippi State, Mississippi

B.S. in Computer Science, Minor in Mathematics — *August. 2017 - Dec. 2018*

- Freshmen Academic Excellence Scholarship.
- President's Scholar (2017, 2018).
- GPA: 4.0/4.0

Research Experience

TCU Department of Computer Science

Fort Worth, TX

Undergraduate Research Assistant - VAE-Powered Vehicle Re-identification Project — *May. 2020 - Present*

- Design a Vehicle Re-identification pipeline which is powered by VAE for image augmentation and filter grafting methods for filter-level learning.
- Design Variational Autoencoder (VAE) to reconstruct images that exclude vehicle-specific details.
- Design convex combination function for residual images and original images to effectively enhance the salient features before feeding images into ResNet50 backbone.
- Evaluate the model on popular benchmarks VeRi-776 and Vehicle-1M.

TCU Department of Computer Science

Fort Worth, TX

Undergraduate Research Assistant - Image-based Vehicle Re-identification - AI City Challenge — *Dec. 2019 - May. 2020*

- Designed a Vehicle Re-identification pipeline to compete in 2020 AI City Challenge - CVPR 2020 workshop.
- Adopted Detectron2 (Faster-RCNN) developed by Facebook to effectively crop image for noise reduction.
- Proposed adaptive attention-driven model with ResNet50 backbone for Vehicle Re-identification.
- Proposed metadata re-ranking method that takes color and type features extracted by ResNeXt101 into consideration when performing k-reciprocal re-ranking.
- Evaluated model on CityFlow Dataset.

TCU Department of Computer Science

Fort Worth, TX

Undergraduate Research Assistant - Beijing Housing Price Prediction Project — *Jun. 2019 - Dec. 2019*

- Researched different Machine Learning and Deep Learning methods used to forecast housing price.
- Applied multiple techniques such as Stack Generalization or Hybrid Regression to enhance the prediction.
- Visualized the housing price distribution of Beijing to find the correlation between price and other features.
- Evaluated the performance of tree-based regression models on feature-rich datasets.
- Investigated the enhancement of prediction results after combining Machine Learning and Deep Learning models.

TCU Department of Computer Science *Fort Worth, TX*

Undergraduate Research Assistant - AI-2-Go Project *Jan. 2019 - Sep. 2019*

- Re-modeled Alpha Go Zero to discover the optimal solutions for Go game.
- Calculated the winning probability of each move using Monte Carlo Tree Search.
- Simulated Go matches between two AIs to find the better AI version.
- Contributed to the open source project of Alpha Go Zero, Leela Zero.

MSU Department of Computer Science and Engineering *Mississippi State, MS*

Technical Team Member - MSU State Space Robotics Team *Oct. 2017 - Dec. 2018*

- Simulated environments for testing obstacle avoidance features of robots using ROS.
- Visualized movements of multiple minibots in 2D using Python.
- Visualized the environments in 3D using Gazebo.
- Delivered the final robot to the yearly NASA Robotic Mining Competition.

Publications

Technical Reports

[1] Image-based Vehicle Re-identification Model with Adaptive Attention Modules and Metadata Re-ranking
Quang Truong, Hy Dang, Zhankai Ye, Minh Nguyen, Bo Mei
2020, URL: `https://arxiv.org/abs/2007.01818`

Peer-reviewed Conference Publications

[2] Housing Price Prediction via Improved Machine Learning Techniques
Quang Truong, Minh Nguyen, Hy Dang, Bo Mei
2019 International Conference on Identification, Information and Knowledge in the Internet of Things (IIKI), *Procedia Computer Science*, 2020, DOI: `https://doi.org/10.1016/j.procs.2020.06.111`

Skills

Programming	Python, C/C++, Java, SQL, R, Scala, LaTeX
Computer Vision and ML	Pytorch, Scikit-learn, MxNet, Gluon, Tensorflow, Keras, Matplotlib, Numpy, Pandas
Robotics	ROS
Languages	English, Vietnamese

Coursework

Computer Science	Data Mining and Visualization, Database Systems, Computer Organization, Computer System Fundamental, Programming Language Concepts, Digital Devices, Data Structures and Analysis of Algorithms
Math	Discrete Mathematics, Elementary Statistics, Linear Algebra, Calculus I-III
Coursera	Introduction to Deep Learning & Neural Networks with Keras, Machine Learning with Python

Honors & Awards

2019	**Research Grant for Beijing Housing Price Prediction - $1500**, SERC Undergraduate Research Grant	*Fort Worth, TX*
2019	**Research Grant for AI-2-Go - $1500**, SERC Undergraduate Research Grant	*Fort Worth, TX*
2019	**Best Undergraduate Research Poster**, Student Research Symposium	*Fort Worth, TX*
2019	**Departmental Nominee**, Student Research Symposium	*Fort Worth, TX*
2019	**1st Prize**, Calculus Bee	*Fort Worth, TX*