Richard Tang

Availability: January - July 2025 | Boston, MA | +1(909)516-1038 | tang.ri@northeastern.edu

EDUCATION

Northeastern University, Boston, MA **May 2028**

Candidate for Bachelor of Science; Computer Science Major with AI concentration

Relevant Courses: Algorithms and Data, Fundamentals of Computer Science 1&2, Object Oriented Design, Discrete Structures

Honors: GPA: 3.96/4.0, Dean's List, Dean's Scholarship

Northfield Mount Hermon Boarding School, Gill, MA **May 2024**

Relevant Courses: AP Computer Science, Discrete Mathematics, AP Statistics, AP Calculus BC, Multivariable Calculus, Linear Algebra

Honors: GPA: 3.95/4.0, the Elliot Computing Award, the Colonel Walter Scott Prize in Linear Algebra

Activities: Vex V5 Robotics Club, Coding Club

TECHNICAL SKILLS

Programming Languages: Python, Java, C++, Go, SQL

Libraries: Pytorch, Tensorflow, ONNX, numpy, Scikit-learn, Flask, Fastapi, Supabase, matplotlib, Pandas, Huggingface, openai-gymnasium

Software: Visual Studio Code, IntelliJ IDEA, Webots Simulator, Issac Gym, Gazebo, Fusion360

RELEVANT LINKS

Linkedin: linkedin.com/in/richardgtang/

Github: github.com/CodeKnight314

Personal Site: richardgtang.me

EXPERIENCE

Undergraduate Researcher at Northeastern University, Boston, MA **September 2024 - Present**

- Investigated using Trihedral Normal Angle structures to improve camera pose estimation and data generation
- Implemented Neural Radiance Field with Pytorch, exploring extensions with different loss functions in rendering.
- Implemented Gaussian Splatting with Pytorch to generate synthetic scenes using camera poses and images.
- Investigated performance trade off with different vision model backbones for PoseNet on 7-Scenes dataset

Machine Learning and Backend Engineer at Alactive, London, United Kingdom **September 2024 - December 2024**

- Led the development of the platform's recommendation engine, achieving **84% top-1 accuracy** in backtesting.
- Built Flask API to facilitate data and recommendation requests with **~400 ms** response time for large volume requests and high-quality video streaming.
- Collaborated with the founding engineering team to manage and optimize database organization for backend API.

PROJECTS

Autonomous/Manual Spatial Tagging and Reconnaissance Application *(Pytorch, ONNX, Numpy)* **August 2025**

- Developed a **real-time object tracking system** using a client-server architecture to reduce onboard computation.
- Implemented a **YoloV11** and **SORT-based** object tracking module to identify and maintain consistent tracking.
- Designed **3D triangulation module** for detected objects using **feature matching** and **bundle adjustment** techniques.
- Integrated **waypoint navigation** for autonomous patrol and reconnaissance.

Goal Conditioned Reinforcement Learning *(Pytorch, panda-gym, openai-gymnasium)* **July 2025**

- Developed a **modular goal-conditioned reinforcement learning framework** supporting multiple RL algorithms.
- Implemented customizable agent classes for **DDPG, TD3, SAC** and **TQC** along with **Standard, PER, and HER buffers.**
- Achieved **competitive success rates** across PandaReach, Push, Pick-and-Place, and Slide benchmark tasks.

Generative Image-Text Automated package *(Pytorch, HuggingFace, Pandas,)* **February 2025**

- Engineered an open-source package for automated image-caption data generation with unstructured image sets.
- Optimized **large-scale dataset processing** through **auto-batching**, reaching **20+ images/s** with **~4GB memory** usage**.**
- Integrated flexible **CLIP-based reranking** and swappable captioning models based on hardware requirements.
- Developed **Genetic Algorithm prompt optimization** with CLIP and LLM-based scoring methods for system prompts.
- Built a **user-friendly command-line interface** tool to simplify user interaction through efficient automation scripts.