Hongyu Tu

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EDUCATION

College of Information & Computer Sciences, University of Massachusetts, Amherst **MA, USA**
Master of Science in Computer Science *Aug. 2021 – May 2023*

A. James Clark School of Engineering, University of Maryland, College Park **MD, USA**
Bachelor of Science in Computer Engineering *Aug. 2017 – May 2021*

SKILLS

Languages & Libraries: Python, C, C++, Java, MATLAB, Assembly, Arduino, SQL, PyTorch, Numpy, OpenCV, pandas

Courses taken: ML Optimization, RL, NLP, DL for Computer Vision and graphics, Graphical Models, Data Science

RESEARCH EXPERIENCE

University of Massachusetts, Amherst **MA, USA**

Project: Re-visiting Retrosynthesis *Jan. 2022 – July. 2022*

Independent Study, Industry Mentor: Veronika Thost (IBM), Ph.D. Mentor: Jay-Yoon Lee

- Evaluated the multi-step performance of 6 existing single-steps models for retrosynthesis analysis.
- Augmented the data to form a new dataset and proposed new metrics for model evaluation.
- Paper "Retrosynthesis Prediction Revisited" selected as NeurIPS 2022 Workshop paper.

University of Maryland, College Park **MD, USA**

Project: Research on Robotic Arm Control Based on Reinforcement Learning *Aug. 2020 – Dec. 2020*

Undergraduate Research, Supervisor: Ph.D. Candidate Xiaomin Lin

- Proposed to use the robot arm to interact with objects to maximize the perception of the object during object identification through recovering the lost information caused by objects concealed by each other.
- Used Unity game engine's reinforcement learning library called ML_Agents to train for robotic arm's control policy.

INTERNSHIP

Futurewei Technologies, IC Lab **Austin, TX**
ARVR System and Alogrithm Research Intern *June 2023 – Present*

- Built real-time tracking & rendering system using Microsoft Azure Kinect DK, MediaPipe, Unity, Zeromq, etc.
- Defined custom file format for humanoid location & rotation data storage and created several datasets containing animations done by different avatars in such format.
- Explored using transformer models to perform time-series based motion prediction & completion with custom data.

Tencent, News Feed Flatform Department, KanDian Team **Shenzhen, China**
Recommender System Optimization Specialist *Dec. 2019 – Jan. 2020*

- Collected dataset with Tencent Internal Domain knowledge for better performance of the model.
- Used NLP techniques to improve the recommender system and generate insights with real-time data feed.

SELECTED COURSEWORKS

Course Project for COMP SCI 685: **Advanced Natural Language Processing** *May. 2022*

- Scraped over 1 million Danmu (live comments) from a Chinese video site Bilibili.
- Proposed to extract in-jokes that are popular within different categories of videos from the 1 million text-based comments, and used decoder to generate Danmu that fits specified video categories.
- Performed fine-tuning to BERT so that it learns to predict the origin category of certain in-jokes.

Course Project for COMP SCI 682: **Neural Networks: Modern Intro** *Nov. 2021*

- Applied computer vision and reinforcement learning to play an arcade game called Crossy Road.
- Constructed a ML system consisting of three neural nets: A custom-trained YOLO to identify game object, its output gets converted to state representations and fed into the RL model which gives the action that will highest reward. The last model acts as a wrapper that will turn the game into a trainable environment.

Course Project for COMPSCI 687: **Reinforcement Learning** *Nov 2021*

- Implemented Reinforce with Baseline, One-Step Actor-Critic, Episodic Semi-Gradient n-step SARSA with PyTorch.
- Constructed Environments including Grid World, Mountain Car, Cartpole, and Blackjack and applied the three algorithms above to the environments to compare the performances.