

Hongyu Tu

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EDUCATION

University of Massachusetts Amherst

Master of Science in Computer Science

Amherst, MA

Aug. 2021 – May 2023

University of Maryland, College Park

Bachelor of Science in Computer Engineering

College Park, MD

Aug. 2017 – May 2021

TECHNICAL SKILLS

Languages: Python, C/C++, Java, MATLAB, SQL, Assembly, HTML

Tools & Libraries: Git, Docker, PyTorch, ROS, pandas, NumPy, Flask, Matplotlib, Seaborn, OpenCV, SciPy

Courses: Reinforcement Learning, Natural Language Processing, Deep Learning for Computer Vision and Graphics, Probabilistic Graphical Models, Data Science, Machine Learning Algorithms (numerical optimization, statistical estimation)

EXPERIENCE

Deep VSLAM Research Assistant

LCE Optics

Feb. 2024 – Present

Philadelphia, PA

- Using Deep learning-based feature extraction and feature matching methods to improve SLAM Performance

ARVR System Research Assistant

Futurewei Technologies, IC Lab

June – Dec. 2023

Austin, TX

- Built real-time tracking & rendering system using Microsoft Azure Kinect DK, MediaPipe, Unity, Zeromq, etc.
- Defined custom file format for humanoid location and rotation data storage and created several datasets containing animations done by different avatars in such format
- Designed algorithms to improve the tracking accuracy for finger and face landmarks over long-distance
- Used transformer model to perform motion prediction using spatial and temporal information

Recommender System Research Assistant

Tencent, News Feed Platform Department, KanDian Team

Dec. 2019 – Jan. 2020

Shenzhen, China

- 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.
- Aimed to give user better article suggestion by predicting which one will be read the most beforehand.

PROJECTS

Bilimemenet | *Python, Hugging face, ByT5, Chinese Roberta, GPT-2, bilibili-api*

Jan. – 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 videos categories from the text-based comments using fine-tuned BERT, and generate Danmu that fits specified video categories

Auto Crossy Road | *Python, PyTorch*

July – Dec. 2021

- Applied computer vision and reinforcement learning to play an arcade game called Crossy Road with three modules: game object detection, state representation generation, and decision making.
- Trained custom YOLO with Self-supervised labeling for real-time game object detection, enabling accurate identification of game elements, which is crucial for decision-making.
- Implemented state representation techniques to reduce input complexity, improving the model's efficiency.
- Used over 100 hours of gaming session to train a custom Deep Q Learning network which outperforms supervised learning approaches

Robotic Arm Control with Reinforcement Learning | *c#, Unity ML-Agents*

Aug. – Dec. 2020

- 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 reinforcement learning library called ML_Agents to train for robotic arm's control policy

PUBLICATION

H. Tu, S. Shorewala, T. Ma and V. Thost, **Retrosynthesis Prediction Revisited**, NeurIPS 2022 AI for Science: Progress and Promises, **2022**.