Hongyi Chen

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EDUCATION

Carnegie Mellon University	Pittsburgh, PA
M.S in Electrical and Computer Engineering; GPA: 3.79 / 4.0	May 2021
Georgia Institute of Technology	Atlanta, GA
M.S in Computer Science; GPA: 4.0 / 4.0	Aug 2021
Peking University	Beijing, China
B.A in Economics; GPA: 3.60 / 4.0	Jun 2019
Beijing University of Chemical Technology	Beijing, China
B.S in Mathematics and Applied Mathematics; GPA: 3.92 / 4.0	Jul 2018

ACADEMIC PROJECTS

Integrating Eye Gaze and Arm Trajectory for Human Motion Prediction — Pittsburgh, USA

Carnegie Mellon University — Sep 2020 – Present

- Measured eye gaze and arm trajectory using Pupil eye tracking glasses and Kinect for desktop assembly task
- Built eye gaze analysis pipeline and extracted the fixation sequence from the raw eye gaze data using Bayesian clustering
- Designed semi-adaptable neural network to predict long timescales human motion with human eye gaze and past trajectory, which improved accuracy by 12.6% compared to the model using trajectory data only

Safe Reinforcement Learning (RL) for Autonomous Driving — Pittsburgh, USA

Carnegie Mellon University — Sep 2020 – Present

- Implemented constrained deep RL, including PPO, TRPO and their constrained forms using Lagrangian-based adaptive penalties for risks, and found trade off between rewards and risks in safety gym testings
- Proposed using motion prediction methods to predict object's path and adding it to risk estimation to improve the rewards while still satisfying safety constraints in Autonomous Driving

GPU-Optimized Search for Gravitational Waves (GW) — Beijing, China

Tsinghua University — June 2018 – Sep 2018

- Accelerated online-searching pipeline for GW from binary coalescences, allowing low-latency GW signal detection
- Parallelized the linear recurrence and optimized inefficient memory access in filtering process to achieve 10x speedup
- Proposed a comprehensive methodology to solve low-latency big data analysis, which included three pillars: parallel algorithms, hardware devices, and implementation optimization

Deep Neural Network Compression — Beijing, China

Beijing University of Chemical Technology — Feb 2018 – May 2018

- Designed and implemented slimmed convolutional neural network (CNN) in resource-constrained platforms
- Achieved 40x compression in CNN model for synthetic aperture radar target recognition, maintaining 98.5% accuracy
- Proposed an efficient forward propagation for pruned CNN, which improved speed by 2-4 times

PROFESSIONAL EXPERIENCE

Perception and Path Planning for Autonomous Vehicles — Pittsburgh, USA

Carnegie Mellon University — May 2020 – Aug 2020

- Implemented path planning, from high level behavior planning to low level RRT path generation and collision checking
- Implemented vehicle coordination at intersection based on vehicle to vehicle (V2V) communication and distributed voting
- Adopted IMU and GPS sensor fusion algorithm for localization and improved the accuracy by 90% when compared to GPS-based kalman filter localization in Carla
- Adopted YOLOv3 network to detect road lanes and implemented pure-pursuit control based on the middle road line

Full Compiler for Tiger Language — Course Project in CS8803 Compilers - Theory and Practice

- Built scanner, parser and syntax error detection in frontend; dealt with semantics analysis and IR code generation in backend

PUBLICATIONS

1. J. Chen, M. Zhao, Z. Li, E. Zhai, T. Yin, F. Feng, **H. Chen**, L. Liu. "Lock-Free Collaboration Support for Cloud Storage Services with Operation Inference and Transformation." *File and Storage Technologies (FAST'20).*
2. **H. Chen**, F. Zhang, B. Tang, Q. Yin and X. Sun. "Slim and Efficient Neural Network Design for Resource-Constrained SAR Target Recognition." Remote Sensing. 2018: Volume 10, Issue 10.