KELING YAO

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EDUCATION

The Chinese University of Hong Kong, Shenzhen **Sep. 2020 – May 2024**
Bachelor of Science in Data Science and Big Data Technology *Shenzhen, China*
- Major GPA: 3.83/4.00, Cumulative GPA: 3.70/4.00 rank 14 out of 180 (top 8%)
- Selected Awards:
  - The Academic Performance Scholarship
  - The Undergraduate Research Award
  - The Full Tuition-Free Admission Scholarship
  - The Dean's List Award
  - The Outstanding Leadership Award

University of California, Berkeley **Aug. 2022 – Aug. 2023**
Exchange Student in Computer Science *Berkeley, United States*
- GPA: 4.00/4.00 top 1%

PUBLICATIONS

- Huang, Z.*, **Yao, K.***, Zhao, S. Z.*, Pan, C.*, Xu, T., Feng, W., & Yang, A. Y. (2023). Towards Subcentimeter Accuracy Digital-Twin Tracking via An RGBD-based Transformer Model and A Comprehensive Mobile Dataset. arXiv preprint arXiv:2309.13570.
- Yang, J., Tan, W., Jin, C., **Yao, K.**, Liu, B., Fu, J., Song, R., & Wang, L. (2023). Transferring Foundation Models for Generalizable Robotic Manipulation. arXiv preprint arXiv:2306.05716.

RELEVANT COURSEWORK

- Data Structures (A+)
- Computer Architecture (A)
- Algorithms (A)
- Operation System
- Machine Learning (A-)
- Deep Learning (A)
- Reinforcement Learning
- Data Science (A+)
- Numerical Analysis (A)
- Stochastic Simulation (A+)
- Stochastic Processes
- Calculus (A)

RESEARCH EXPERIENCE

Research Assistant - Microsoft Research Asia **June 2023 – Present**
Supervisor: Dr. Jianlong Fu, Senior Research Manager, Multimedia Search and Mining Group at Microsoft Research Asia, Beijing, China *Beijing, China*
- Published a real-world multi-modal imitation learning policy model to address a generalization of pick-and-place robot manipulation tasks.
- Accomplished independently a 30Hz robotic manipulation paradigm involving VR teleportation, control of dexterous hands, and Franka robot arm.
- Contributed to the design of the model by utilizing Vision Foundation Models and multi-modal fusion of semantic, geometric, and temporal observations, achieving sample-efficient generalization learning with an overall accuracy of 81.25%.

Research Assistant - Berkeley OpenARK Lab **December 2022 – Present**
Supervisor: Prof. Allen Yang, Executive Director of FHL Vive Center for Enhanced Reality, UC Berkeley, US *Berkeley, United States*
- Published an RGBD-based 6DoF pose estimation paradigm for Digital Twin applications, withstanding the low-quality depth data in mobile devices.
- Led and established the only RGBD 6DoF pose estimation database (DTTDv2) captured by iPhone 14 Pro, including 18 rigid objects and 100 scenes.
- Conducted LiDAR depth analysis on 47668 frames of the DTTD database and introduced a novel depth-ADD metric for quantitative measurement.
- Contributed to a Transformer-based 6DoF pose estimator designed to withstand noisy depth, surpassing performances of all existing baselines.
- Developed an efficient data collection paradigm (uploaded on GitHub), utilizing OptiTrack system and a self-developed software in iPhone 14 Pro.

Research Assistant - Robot Laboratory of South China University of Technology **May 2022 – September 2022**
Supervisor: Prof. Zhijun Zhang, South China University of Technology, China *Guangzhou, China*
- Explored face recognition algorithms and independently implemented SOTA algorithms (yolov5, dlib, arcface) on robot Ubuntu Linux system.
- Developed an innovative software enabling robots to engage in conversations with users, memorize unfamiliar faces, and recognize previously encountered faces in real-world robots, which was successfully deployed into a commercial robot.

Research Assistant - Shenzhen Key Laboratory of Steroid Drug Research and Development **June 2021 – January 2022**
Supervisor: Prof. Baoting Zhu, the Chinese University of Hong Kong, Shenzhen, China *Shenzhen, China*
- Explored machine learning approaches in protein-ligand docking, and ran dynamics simulations using Discovery Studio and Gaussian.
- Analyzed the diverse Cyclooxygenases-flavonoids simulation data by statistics and machine learning to predict the protein-ligand binding affinity.
- Summarized output statistic data of 10 ligands and explained their biological meaning with activators or inhibitors.

SELECTED PROJECTS

General Computational Machine based on GPT-2 | *Python, PyTorch* **April 2023 – August 2023**
- Constructed a General Computational Machine by incorporating a pre-trained GPT-2 model and explored the generalization capabilities of transformers in diverse domain tasks beyond traditional language tasks (Bit-wise operation, Bit Memory, and Image Classification).
- Explored the advantages of the General Computational Machine model compared to ResNet-50 by visualizing the attention map for each task.

Cal Course | *React, TypeScript, Python, Amazon Web Services (AWS)* **September 2022 – April 2023**
- Designed and implemented the front-end login interface for Cal-Course website (Berkeley On-Campus Organization) using React and TypeScript.
- Integrated and processed user data from the Cal-Course backend and WeChat API, subsequently storing the information on Amazon Web Services.

Simulation for Video Game Server Under Different Matchmaking Strategies | *Python, Simio* **September 2022 – December 2022**
- Designed innovatively a Markov Chain model to simulate players' strategies on leaving a game server by their game experience.
- Established the simulation experiments with various matchmaking strategies of the game server (fair match, random match, and target match).
- Accomplished the optimal match-making strategy with the presence of AI bots to significantly maximize the revenue of a game company.

LEADERSHIP

Vice-President - Resident Student Association of Harmonia College **August 2021 – September 2022**
- Steered the team to secure the "Outstanding Student Organization Award" from Harmonia College — highest accolade for student organizations.
- Orchestrated 5 large-scale student events, each with over 100 attendees, overseeing both the administrative tasks and on-site management.
- Led a dedicated team of 30+ members, ensuring the fulfillment of daily needs and concerns of the college residents.

SKILLS

Language: English (Full professional proficiency - TOEFL: 105, GRE: 326), Chinese (Native proficiency)
Programming Languages: Python, C, C++, C#, Java, Swift, JavaScript, SQL, MATLAB, Linux Shell, LaTeX
Developer Tools: Unity, Blender, Git, Anaconda, Docker
Frameworks: PyTorch, TensorFlow, OpenCV, ROS