Yi WU

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Education

Master's degree, Erasmus Mundus Joint Master (ULB, UPC, Paris Saclay)   Europe, Sep 2021 - Sep 2023

Major: Big Data Management and Analytics, Full Scholarship Recipient

Bachelor's degree, Tsinghua University   Beijing, Sep 2011 - Jul 2016

Major: Information Management and Information Systems, School of Economics and Management

Secondary Bachelor's degree, Tsinghua University   Beijing, Sep 2013 - Jul 2016

Major: Design (3D Game Design), Academy of Arts & Design

Robotics Research Experience

Literature Review on VLMs-Powered Robotics, Kent State University   Kent(remote), Oct 2023

Github: https://github.com/jaswu51/LLM_Finetune

- Conducted a comprehensive review of applying Large Language Models (LLMs) in robotics' reasoning, manipulations, motion planning, and navigation. Investigated the architectures of Large Vision-Language Models (VLMs) base models, including CLIP, BLIP, BLIP-2, MiniGPT-4, and LLaVA. Acquired hands-on experience with PEFT (Q-LoRA), TRL, and DDP. Explored specific tech aspects such as extending context window size by LongLoRA.

Physics-Guided Robotics Dexterous Manipulations, Kent State University   Kent(remote), Nov 2022 - Sep 2023

* ICRA 2024 Submitted*, Github: https://github.com/jaswu51/ShadowHand_Manipulation

- Developed a physics-guided representation learning framework that models actions during long-period tool-use manipulations as selections of underlying fundamental physics laws (i.e. spatial constraints, kinematics, and dynamics), creating a discrete and explainable reinforcement learning action space.
- Validated the proposed method using PPO and A2C in four complex tool-use tasks with the Shadow Hand model in Isaac Sim: hammering a nail, sweeping with a broom, pinching a cube with tweezers, and opening a bottle cap.

Accessibility-Aware Reinforcement Learning for Inclusive Robotic Navigation   Kent(remote), Jun-Sep 2023

* ICRA 2024 Submitted*

- (Co-author) Participated in designing and implementing experiments to assess the model's effectiveness in various disability-assistance scenarios, including navigating disabled individuals in environments like museums, traffic, and building patios.

Advancing Human-Robot Interaction (HRI) via Digital Twins, Kings College London   London, Apr - Aug 2023

* Master Degree Thesis, Paper to be Published*, Github: https://github.com/jaswu51/Toyota_HSR_Benchmark

- Created an HRI Reinforcement Learning (RL) benchmark for the Toyota Human Support Robot (HSR) in Omniverse Isaac Sim, employing PPO and TD3 as baselines. Focused on generating desired human USD Skeleton animations.
- Explored Digital Twin: for real2sim, 3D scene & human pose reconstruction via InstantNerf and HybriK; for sim2real, vision-based training on photorealistic synthetic scenes, translated to physical robot camera seamlessly.

School Research Projects on Graph Analysis

Video Anomaly Detection via Massive Graph Analysis, Paris Saclay University   Paris, Sep 2022- Feb 2023

Github: https://github.com/NiccoloMorabito/BDRP-SequentialSpatialGraphs

- Workflow: Applied object detection on ShanghaiTech, Avenue, and Street Scene datasets using YOLOv5+Deepsort. Converted objects' spatial-temporal relationships into graphs. Used Graph Attention Networks (GATs) for hetero-graph embeddings and classified graph anomalies using Transformer's encoder module.

Poster: A Survey of Graph Embeddings, Tenth European Big Data Management & Analytics Summer School
Github:https://github.com/jaswu51/A_Survey_of_Graph_Embeddings   Cesena, July 2022
- Reviewed various Graph Embedding methods including GCN, GAT, GraphSage, DeepWalk, etc., and applied them using PyG, DGL, and NetworkX libraries.

Graph Database Exploration, Universitat Politècnica de Catalunya   Barcelona, Mar - Jun 2022
- Property Graph: analyzed DBpedia data via Neo4j, implemented page-rank, and betweenness algorithms.
- Distributed Graph: utilized Pregel and GraphX to conduct distributed analysis.
- Knowledge Graph: generated TBOX and ABOX via RDFLib, and conducted SPARQL queries in GraphDB.

Work Experiences

AI Agent Developer (Intern), Center for Collaborative & Conversational Intelligence Beijing, Nov 2023-Present
- Responsible for developing Langchain-based collaborative AI agents, such as agents using bioinformatics for new protein discovery, and knowledge retrieval agents to get proteomics data from vector databases that contain academic papers with knowledge graphs. Aligned the agents with expert knowledge and integrated their Chain-of-Thought reasoning with actions.

Technology Investment Manager (Full Time), Node Capital   San Francisco & Beijing, Apr 2018 - Aug 2019
- Research: Chief researcher at Node Research Center, producing published media articles on Formal Verification, AI & Blockchain, IoT & Blockchain, and Distributed Storage. Co-author of the published book "Blockchain+".
- Investments and Incubation: Led due diligence on eight investments focused on AI, Blockchain, and New Consumptions, ranging from Angel to Series B rounds. Successfully incubated four projects (Fractal, Bitcent, Bitforest, Matrix) with a total fundraising size of $10 million.
- Networking: Engaged actively in business networking with top-tier technology ventures, including Metastable, Polychain, DCG, and Pantera. Sourced and facilitated the commercialization of academic research, promoting industry-academic collaboration.

Business Analyst (Full Time), Global Fund Management, JD Capital   Beijing, Apr 2016 - Dec 2017
- Client Database Maintainance: Maintained the Limited Partner investor database and their portfolios. Built a knowledge graph to predict LPs' investment preferences and conducted credit investigations for their portfolios.
- Fundraising for Funds: Collaborated on drafting USD FUND III Private Placement Memorandum and PitchBook with King & Wood Mallesons HK office. Engaged in communications with potential LP investors.

Personal Information

Programming
- Deep Learning: Pytorch, Huggingface, DeepSpeed, Jax, Gymnasium
- AI Agent development: Langchain, Autogen frameworks
- Robotics simulators and 3D software: Omniverse Isaac Sim, Mujoco, Unity, Maya, C4D, etc.
- Hardware: ROS, Arduino, Raspberry Pi
- Data engineering: No-SQL databases such as HDFS and MongoDB, Spark, Tableau

Languages
- English (GRE 331, TOEFL 103), Chinese (Native), French (Basic), and Spanish (Basic).

Hobbies
- Science fiction, Ukulele