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# YI WU

## EDUCATION

2011–2016 **Bachelor in Information Management and Information Systems**
School of Economics and Management, Tsinghua University

2013–2016 **Second Bachelor in Interactive Media Design**
Academy of Arts & Design , Tsinghua University
Specialization: 3D Game Design, Smart Hardware

2021–2023 **Erasmus Mundus Joint Master in Big Data Management and Analytics**
School of Computer Science, Université Paris-Saclay, Université libre de Bruxelles, Universitat Politècnica de Catalunya
Specialization: Massive Graph Analysis
Award: Erasmus Mundus Full Scholarship; Graduated with Honors

## PUBLICATIONS

2024 RO-MAN Submitted, First Author **Physics Representation Learning for Dexterous Manipulations**
Cognitive Robotics and AI Lab (CRAI) · Kent State University
Video: https://github.com/jaswu51/ShadowHand_Manipulation/

2024 RO-MAN Submitted, Co-Author **Accessibility-Aware Reinforcement Learning for Inclusive Robotic Navigation**
Cognitive Robotics and AI Lab (CRAI) · Kent State University

2022, Poster, First Author **A Survey of Graph Embeddings**
Tenth European Big Data Management & Analytics Summer School ·

2017, Paper, Co-Author **Client Game Valuation Method Based on Social Network**
https://ieeexplore.ieee.org/document/8276763 ·

2016, Paper, Co-Author **Using Real Option Model to Evaluate Movie Investments Based on Social Network**
https://ieeexplore.ieee.org/document/7816961/ ·

## MASTER THESIS

Apr–Aug, 2023 | **Advancing Human-Robot Interaction (HRI) via Digital Twins**
Social AI & Robotics Lab (SAIR) · Kings College London

1. Created an HRI Reinforcement Learning (RL) benchmark for the Toyota Human Support Robot (HSR) in Omniverse Isaac Sim, employing PPO and TD3 as baselines.
2. Tackled generating desired human USD Skeleton animations.
3. 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.
`https://github.com/jaswu51/Toyota_HSR_Benchmark/`

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## RESEARCH IN ROBOTICS

Oct, 2023–Nov, 2023 | **Literature Review on VLMs-Powered Robotics**
Cognitive Robotics and AI Lab (CRAI) · Kent State University

Reviewed literature on applications of LLMs in robotics, including RT-X, PaLM-E, Eureka, etc. Investigated model architectures of VLMs like CLIP, BLIP, BLIP-2, MiniGPT-4, and LLaVA that serve as base models for LLMs. Gained hands-on experience with prompt engineering fine-tuning techniques such as PEFT (Q-LoRA), TRL, and DDP. Explored techniques to extend context size for LLMs, such as LongLoRA.
`https://github.com/jaswu51/LLM_Finetune/`

Nov, 2022–Sep, 2023 | **Physics Representation Learning for Dexterous Manipulations**
Cognitive Robotics and AI Lab (CRAI) · Kent State University

1. Developed a Physics Representation Learning (PRL) framework for anthropomorphic robotic hand manipulations that models actions during long-period tool-use manipulations as selections of underlying fundamental physics laws (i.e. spatial constraints, kinematics, and dynamics).
2. Validated the proposed PRL framework using PPO and A2C reinforcement learning algorithms in four complex tool-use tasks simulated in Isaac Sim using the Shadow Hand model: hammering a nail, sweeping with a broom, pinching a cube with tweezers, and opening a bottle cap.
Video: `https://github.com/jaswu51/ShadowHand_Manipulation/`

Jun, 2023–Sep, 2023 | **Accessibility-Aware Reinforcement Learning for Inclusive Robotic Navigation**
Cognitive Robotics and AI Lab (CRAI) · Kent State University

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.

## RESEARCH IN DATA ANALYSIS

Sep, 2022–Feb, 2023 | **Video Anomaly Detection via Massive Graph Analysis**
Laboratoire de Recherche en Informatique(LRI) · Université Paris-Saclay

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

July, 2022 | **A Survey of Graph Embeddings**
Tenth European Big Data Management & Analytics Summer School ·

Reviewed various Graph Embedding methods including GCN, GAT, GraphSage, DeepWalk, etc., and applied them using PyG, DGL, and NetworkX libraries.
`https://github.com/jaswu51/A_Survey_of_Graph_Embeddings/`

Mar–Jun, 2022 | **Graph Database Explorations**
Universitat Politècnica de Catalunya ·

1. Property Graph: analyzed DBpedia data via Neo4j, implemented page-rank, and betweenness algorithms.
2. Distributed Graph: utilized Pregel and GraphX to conduct distributed analysis.
3. Knowledge Graph: generated TBOX and ABOX via RDFLib, and conducted SPARQL queries in GraphDB.

Mar–Jun, 2022 | **Entrepreneurial Project: Food Recommendation App in Barcelona**
Universitat Politècnica de Catalunya ·

Workflow:
1. Scraped Barcelona restaurant reviews, descriptions, and images from Google Maps, Yelp, and Instagram and loaded them into an HDFS temporary storage zone.
2. Transmitted the data to MongoDB for persistent storage, preprocessed it using SparkRDD, and generated new feature tags.
3. Transferred the data into Neo4j's property graphs to construct relationships between restaurant-user pairs and user-user pairs.
4. Recommended restaurants through collaborative filtering on graphs.
5. Tested the recommendation system with the restaurant named Els Quatre Gats (Four Cats), which Picasso frequented during his time in Barcelona. The system successfully recommended restaurants with similar vibes.

Oct, 2019 | **Magnetic Resonance Imaging Camp**
Hangzhou Normal University ·

Conducted Meta-Analysis, Functional Connection Analysis for fMRI brain image data using neuroimage software: Spm8, GingerALE, MRIcron, Restplus, XJView.

## WORK EXPERIENCE

Nov, 2022–Present

**AI Agent Developer, Intern**
Center for Collaborative & Conversational Intelligence (C3I) · Department of El
Engineering, Tsinghua University

1. Participated in the design and development of custom tools, chain
ners, and agent ReACT mechanisms, avoiding reliance on existing frameworks,
Langchain, to tailor solutions to our specific needs.
2. Collaborated with the National Protein Science Center to embed their kno
graphs into vector databases. Linked knowledge graphs with academic paper
format, enhancing the integration of diverse data sources.

Apr,2018 – Aug, 2019

**Technology Investment Manager, Full Time**
Node Capital ·

1. Research: Chief researcher at Node Research Center, producing pu
media articles on Formal Verification, AI & Blockchain, IoT & Blockcha
Distributed Storage. Co-author of the published book “Blockchain+”.
2. Investments and Incubation: Led due diligence on eight investments focuse
Blockchain, New Consumptions, ranging from Angel to Series B rounds. Succ
incubated four projects (Fractal, Bitcent, Bitforest, Matrix) with a total fundrais
of 10 million USD.
3. Networking: Engaged actively in business networking with top-tier tech
ventures, including Metastable, Polychain, DCG, and Pantera. Facilitated the i
academic collaboration.

Apr,2016 – Dec, 2017

**Business Analyst, Full Time**
Global Fund Management, JD Capital ·

1. Client Database Maintainance: Maintained the Limited Partner investor da
and their portfolios. Predicted LPs’ investment preferences and conducte
investigations for their portfolios.
2. Fundraising for Funds: Collaborated on drafting USD FUND III Private Pla
Memorandum and PitchBook with King & Wood Mallesons HK office. Eng
communications with potential LP investors.

This and that. The usual, aye?medal.jpeg

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## Programming

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

## LANGUAGES

Chinese (mother tongue)
English (GRE 331, TOEFL 103)
French (basic)
Spanish (basic)

## HOBBY

Science fiction, Ukulele