Junfei Zhan

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Education

University of Pennsylvania **Aug. 2024 – *Expected* May 2026**
MS Student in Electrical Engineering *Philadelphia, USA*

GPA: 4.00/4.00

University of Birmingham & Jinan University **Sept. 2020 – June 2024**
BSc in Applied Mathematics with Information Computing Science *Birmingham, UK*
Dual Degree - BSc in Information and Computing Science *Guangzhou, CN*

Honors: First Class Honors (University of Birmingham)
GPA: 3.82/4.00 (Birmingham), 4.01/5.00 (Jinan)

Relevant Coursework

- Autonomous Driving (A+)
- Graph Neural Networks (A)
- Applied Machine Learning (A)
- Information Theory (A)
- Linear System theory (A)
- C Programming (A)
- MATLAB Programming (A+)
- Game theory (A+)
- Applied Statistics (A)
- Modern Convex Optimization (A+)

Honors & Awards

Outstanding Undergraduate Thesis Award, Jinan University, 2024

Outstanding Undergraduate Achievement Award, Jinan University, 2024

First-class Scholarship, Jinan University, 2023 & 2024

China National Scholarship (0.2% - The highest national scholarship for Chinese undergraduates), 2022

Publications

Junfei Zhan, Jiayi Wu, Tengjiao He, Kwan-Wu Chin, "Task Offloading and Approximate Computing in Solar Powered IoT Networks," *IEEE Networking Letters*, vol. 6, no. 1, pp. 26-30, March 2024, doi: 10.1109/LNET.2023.3328893.

Tengjiao He, **Junfei Zhan**, Kwan-Wu Chin, Fei Song, "Minimizing Maximum Age of Service in Computing Powered Green IoT Networks." *IEEE Transactions on Services Computing* (Under Review, SCI JCR Q1, CCF-A).

Junfei Zhan, Zexuan Yu, Tengjiao He, "Can Large Language Models Credibly Stand in for Humans in Game-Theoretic Experiments?" *ACM Multimedia (MM) 2025 Conference* (Under Review, CCF-A).

Haoxun Shen, **Junfei Zhan**, Tengjiao He, "RL-Enhanced Disturbance-Aware MPC for Fast and Robust UAVs Trajectory Tracking." *IEEE SMC 2025 Conference* (Under Review, Tsinghua-A).

Research Projects

Can Large Language Models Credibly Stand in for Humans in Game-Theoretic Experiments?

Lead Author, Advisor: Prof. Tengjiao He ***Oct. 2024 – Apr. 2025***

- Investigated whether LLMs can replicate human behavior in classic economic games (e.g., Prisoner's Dilemma, Ultimatum, Public Goods) under varying payoff structures.
- Built a role-conditioning framework enabling LLMs to play multiple roles in multi-agent game settings, with control over behavioral attributes such as risk aversion and reciprocity.
- Proposed a benchmark suite and statistical protocol to evaluate LLM-human behavioral alignment, demonstrating LLMs' capacity to simulate diverse human-like strategies.

Minimizing Maximum Age of Service in Virtualized Green IoT Networks

Research Assistant, Advisor: Prof. Kwan-Wu Chin ***May 2024 – Dec. 2024***

- Formulated a mixed integer linear programming (MILP) model to optimize the embedding and scheduling of Virtual Network Functions (VNFs) in solar-powered IoT networks, minimizing the maximum age of service (AoS).

- Developed a Receding Horizon Control Optimization (RHCOP) algorithm leveraging Gaussian Mixture Models (GMM) to predict energy arrivals and wireless channel gains for efficient resource allocation.
- Implemented resource-aware embedding of Directed Acyclic Graph (DAG) requests to balance computational loads, manage energy constraints, and enhance the freshness of IoT services.

Task Offloading and Approximate Computing in Solar-Powered IoT Networks
Lead Author, Advisor: Prof. Tengjiao He ***Nov. 2022 – Jun. 2023***

- Proposed a Mixed Integer Linear Programming (MILP) model to jointly optimize task offloading, approximate computing, and resource allocation in IoT networks.
- Developed a Digital Twin-assisted Receding Horizon Control (DT-RHC) framework using Gaussian Mixture Models (GMM) for dynamic scheduling.
- Achieved energy-efficient task execution strategies while balancing computation accuracy and resource constraints.

Competitions

Kaggle: Google - Fast or Slow? Predict AI Model Runtime ***Oct. 2023***
Prize: Bronze Medal (Top 10%)

- Preprocessed data and built a Graph Convolutional Network (GCN) to predict runtime of graphs and configurations using a machine learning model trained on runtime data.

2022 China Undergraduate Mathematical Contest in Modeling ***Sep. 2022***
Prize: Provincial First Prize (Top 10%)

- Applied Logistic Regression, Fuzzy C, Principal Component Analysis, and K-Means Clustering to conduct weathering analysis and classification of ancient glass artifacts.

2022 Mathematical Contest in Modeling ***Feb. 2022***
Prize: Honorable Mention (Top 30%)

- Utilized Empirical Mode Decomposition (EMD) and Long Short-Term Memory (LSTM) neural networks to develop a portfolio strategy for gold and bitcoin.

Internship Experience

JLL (Jones Lang LaSalle) **Aug. 2023 – Oct. 2023**
Intern in Data Analytics *Shenzhen, China*

- Collected and analyzed data, including tenants, vacancy rates, and business performance metrics, through on-site surveys of 600+ companies and 40+ Grade-A office buildings.
- Utilized SQL for data extraction and Excel for updating databases, ensuring accurate and up-to-date information.
- Developed a program to extract text from large image datasets and efficiently manage text files, significantly improving workflow efficiency.

Extracurricular Activities

Class Representative **Sep. 2020 – Jun. 2024**
Undergraduate Program *Class Size: 36*

- Organized over 25 class activities, including hiking, short trips, and experience-sharing sessions with seniors.
- Coordinated a group graduation photo session for more than 260 students across the college.
- Led a long-term volunteer activity at the school hospital, providing patient directions for 200 service hours.

Technical Skills

Programming Languages: C, Python, SQL, MATLAB, R, SPSS
Algorithms: PID Controller, Dijkstra, Dynamic Programming, Receding Horizon Control, Simplex, Big-M Method
Frameworks: PyTorch, Pyomo, scikit-learn