Junfei ZHAN

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EDUCATION

University of Birmingham & Jinan University (Dual Degree) **Sep.2020-Jul.2024**

BSc in Applied Mathematics with Information Computing Science

- **GPA:** 3.98/4.25; 89.2/100 **Degree classification:** First Class (expected); 75% average in British-style marking system

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

RESEARCH

Minimizing Maximum Age of Processing in Virtualized Green IoT Networks **Oct.2023-Present**

Research Assistant, Advisor: Prof. Kwan-Wu Chin | University of Wollongong

- Proposed an integer linear programming model to minimize the maximum age of processing, which enables load balancing by considering embedding virtual network functions in green IoT networks.
- Presented an online directed acyclic graph (DAG) prediction embedding (ODPE) method using Gaussian mixture model (GMM) to predict solar energy arrivals and channel gains, and then leveraged receding horizon control (RHC) to schedule DAG requests in each time slot.

Optimize Energy Consumption for Workflow in Serverless Computing within IoT Networks **Jul.2023-Present**

Undergraduate Theis, Advisor: Prof. Tengjiao He | Jinan University

- Modeled the IoT edge network workflow as a Directed Acyclic Graph (DAG), accounting for precedence relationships among micro-tasks and integrating solar-charged IoT edge servers, focusing on energy supply dynamics and stateless function configurations.
- Developed an energy-efficient scheduling scheme leveraging reinforcement learning and inter-task correlations to minimize energy consumption

Wireless Communication Techniques and OFDM Applications **Jul. 2023-Aug. 2023**

Research Assistant, Advisor: Prof. Zijun Gong | The Hong Kong University of Science and Technology (Guangzhou)

- Conducted simulations to assess the Symbol Error Rate (SER) and Bit Error Rate (BER) of Quadrature Phase Shift Keying (QPSK) modulation in both Additive White Gaussian Noise (AWGN) and Rayleigh fading channels, analyzing QPSK performance across diverse channel conditions
- Investigated Orthogonal Frequency-Division Multiplexing (OFDM) for multiple data stream transmission, showing its ability to eliminate inter-symbol interference through its unique orthogonal nature, improving data transmission in multi-user systems.

Task Offloading and Approximate Computing in Solar Powered IoT Networks **Nov.2022-Jun.2023**

Research Assistant, Advisor: Prof. Tengjiao He | Jinan University

- Designed and proposed a Mixed Integer Linear Programming (MILP) approach using Pyomo for task offloading and approximate computing in solar-powered IoT networks
- Developed a heuristic solution based on Gaussian Mixture Model and Digital Twin to cater to large scale network scenarios, offering a scalable and efficient task offloading strategy
- Conducted extensive simulations to validate the effectiveness of the proposed methods, demonstrating notable improvements in network efficiency and significant reduction in energy consumption
- **Publication: Junfei Zhan**, Jiayi Wu, Tengjiang He*, Kwan-Wu Chin. *Task Offloading and Approximate Computing in Solar Powered IoT Networks*. Accepted. IEEE Networking Letters. DOI: 10.1109/LNET.2023.3328893

COMPETITIONS

Kaggle: Google - Fast or Slow? Predict AI Model Runtime | Bronze Medal(63/617) **Oct.2023**

- Goal: Train a machine learning model based on the runtime data provided in the training dataset and further predict the runtime of graphs and configurations in the test dataset
- Duties: data preprocessing and the building of Graph Convolutional Networks

2023 Interdisciplinary Contest in Modeling | Honorable Mention(30%) **Feb.2023**

- Utilized the P-S-R Model, PCA, and Correlation Coefficient Method to analyze light pollution factors and proposed effective mitigation strategies for different regions

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

- 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 | Honorable Mention(30%) **Feb.2022**

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

INTERNSHIP

JLL (Jones Land LaSalle)| *Intern in Data Analytics* **Aug.2023-Oct.2023**

- Collected and analyzed data, including tenants, vacancy rate and business performance metrics, with on-site surveys of 600+ companies and 40+ Grade-A office buildings; Utilized SQL for data extraction and Excel for database updates
- Wrote a program to extract text from massive images and deposit and read text files to improve work efficiency

SKILLS

Programming: MATLAB, Python, R, C, SQL