Wenbo ZHAO

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Education

Dalian University of Technology (DLUT) 09/2017 – present

B.E. in Network Engineering

- **GPA:** 3.80/4.0 (Ranked 1 of 22 in the Internet of Things Class)
- **Scholarships:** Second-class scholarship for study (awarded both in 2018 and 2019)

Skills & Hobbies

Programming: Python, MicroPython, JAVA, SQL, C, C++, HTML
Software & Hardware: Atom, XCode, MySQL, Emacs, MATLAB**,** Lopy4
Operation Systems: macOS, Windows
Fine Arts: Saxophone, Sketch (won several municipal, provincial and national level awards)
Hobbies: Traveling, Movies, Badminton, Jogging

Research

A new LPWAN-based health code for the COVID-19 pandemic 08/2020 – present

Team Member

- **Supervisor:** Prof. Lei WANG, at DLUT
- **Description:**
  - Introduce a physical health code device based on LPWAN remote communication technology and blockchain technology.
- **Responsibilities:**
  - Realize the functions via coding, did experiments and collected data, wrote part of the conference paper (under review)
- **Innovation:**
  - It uses blockchain technology to prevent data from being stolen by anyone. ZigBee interaction between users and the public equipment of the site and NB-IOT interaction between users and the server.

A Data Backhaul Method for Low-power Ocean Sensing Data (Multi-hop LoRa Network) 09/2019 – present

Team Member

- **Supervisor:** Prof. Lei WANG, at DLUT
- **Description:**
  - Introduce a LoRa-based low-power marine data backhaul approach, establish hierarchical and directional LoRaWAN mesh networks
- **Responsibilities:**
  - Realize functions via coding, did experiments, collected data, wrote part of the conference paper (under review)
- **Innovation:**
  - Extend network coverage, improve data reception and effectively avoid single points of failure via a network topology that combines linear, tree-like and MESH structures

High Robust Indoor Positioning System Based on AOA 09/2018 – 06/2019

Team Member

- **Supervisor:** Prof. Lei WANG, at DLUT
- **Description:**
  - Created ArSeRoL (a new type indoor positioning system via Wi-Fi signals), which applies secondary segmentation and area segmentation of space using AoA (angle of arrival) and RSS information
  - Ensured high robust of the algorithm via lower judgment requirements and additional fault node detection

- **Responsibilities:**
  - Realized functions via coding, did experiments, collected data, wrote part of the conference paper (under review)
- **Innovation:**
  - Enhanced the robust of current indoor positioning systems, improved the usability of these systems

Competitions

2019 APMCM 11/2019 – 12/2019

Team Leader

- Analyzed the pros and cons of economic development in Zhejiang province, and made appropriate suggestions based on the conclusions of the first three questions and the current economic situation and provincial policies
- Provided part of the solutions, realized part of the algorithms, finished part of the final report, won the 3rd Provincial Prize for the 2019 APMCM Competition

2019 CUMCM 09/2019

Team Leader

- Differentiated the working process of high-pressure fuel line by time, analyzed the changes of various factors in a short period under ideal conditions, iterated several times to get the required result via Python
- Obtained several functions and the relationship between each variable by using differentiation, integral, ideal gas equation of state, dichotomous method, function fitting via MATLAB, and other methods
- Did simulations and validations via Python and MATLAB, got the best values of multiple sets of data and variables, established several models, proposed solutions for high-pressure fuel lines in complex situations
- Provided part of the solutions, realized part of the algorithms, finished part of the final report, won the 3rd Provincial Award for the 2019 CUMCM Competition

2019 MCM/ICM 01/2019

Team Leader

- Analyzed the characteristics of existing resources and urban distribution of Puerto Rico, in order to better solve these problems in actual (i.e. when hit by the worst hurricane on record in 2017)
- Proposed a model to create the best scheme of drone fleet via the 3D-KLP algorithm, packing algorithm, and a new AHP algorithm; Optimized ISO container deployment by k-means and gravity; Simplified flight path for drones under different needs by transforming actual problems into graphics problems
- Provided part of the solutions, realized part of the algorithms, finished part of the final report, won the 'Honorable Mentions' for the 2019 MCM/ICM

Projects

Wenbo Movie (a Video Website with User Features) 03/2020 – 04/2020

Independent Developer

- Developed a website with functions of viewing, search, favorite, comments and filmmaker information based on python and HTML programming; Realized data ORM, pleasing interface and rigorous logic via Django

Influencing Factors for Movie Recommendations and Ratings Based on Weighted K-means 09/2019 – 10/2019

Independent Developer

- Crawled movie information from douban.com while coping with anti-crawling system by adding header and cookie
- Rated the beauty of lead actor or actress of each movie via Baidu's Face Recognition API
- Re-classified and re-rated movies for from person to person using weighted K-means and machine learning, feedback appropriate movies to users based on interest matching, visualized some of the results

Activities

Student Union of DLUT 10/2017 – 09/2018

Officer

- Designed layout and content for the film & book sharing section and for the newspaper section on the bulletin board
- Organized learning, reading, performing, advocating and sports squads training activities