

# Jinghao Wen

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## EDUCATION

## Central China Normal University (CCNU)

09/2020-06/2024 (Expected)

*Bachelor of Science to be conferred*

- Major: **Computer Science and Technology**
- Cumulative GPA: 87.1/100 Ranking: 3/182
- Honors: Chinese National Scholarship (10/2023); Golden Scholarship for Merit Students (10/2023); Silver Scholarship for Merit Students (10/2022); Merit Student at the school level (2021 & 2022)
- Key coursework: Operating System, Data Structures, Database, Algorithms Design and Analysis, Machine Learning

## PUBLICATION

**Wen, J.,** Chen, J., Jiang, J., Bi, Z., & Wei, J. (2023, March). Application of Computer Vision Technology Based on Neural Network in Path Planning. In *The International Conference on Cyber Security Intelligence and Analytics* (pp. 207-216). Cham: Springer Nature Switzerland.

Li, Y., Luo, J., **Wen, J.**, & Zhang, Y. (2022, May). Human phone usage recognition based on OpenPose. In 2022 3<sup>rd</sup> International Conference on Computer Vision, Image and Deep Learning & International Conference on Computer Engineering and Applications (CVIDL & ICCEA) (pp. 1-6). IEEE.

Shao, W., Ding, Y., **Wen, J.**, Zhu, P., & Ou, L. (2023). Optimal decision-making in the water, land and food nexus using artificial intelligence and extreme machine learning. *Water Supply*, ws2023201.

## RESEARCH EXPERIENCE

ECE Department, University of Florida, *Research Intern*

07/2023-08/2023

- For multi-camera system, realized the transformation and calibration among world coordinate, camera coordinate, image coordinate, pixel coordinate. Achieved camera pose estimation and triangulation.
- Applied the Canny and Sobel in edge detection, compared and applied Surf and Sift in feature detection and keypoints matching. Added adaptive filters for a more smooth effect on noise and a less smooth effect on edge.
- Improved the anti-noise performance of the Sobel operator by using the weighted nuclear norm minimization (WNNM) image denoising algorithm.

**Smart Robot Lab, Central China Normal University, *Research Assistant***

12/2020-Present

# Intelligent Biped Humanoid Robot Based on Jetson Nano

02/2022-03/2023

*Project Team Leader; Project for National Innovation and Entrepreneurship Training Program for College Students*

- Finished the 3D modeling by SolidWorks, detailed rendering by 3ds Max and assembled robot with servo motor.
- Simulated robot in ROS and deployed algorithms on Jetson Nano. Built a URDF model of the robot, developed robot's gait planning, path planning and conduct simulation in Rviz and Gazebo.
- Used the OpenPose algorithm to realize the human body posture recognition function with 91.7% accuracy. Converted the distance and angle information between the joint skeletons into the signal of the servo motor to control the posture and movement of the robot. Action synchronization rate reached 88.6%.

# Intelligent Quadruped Robot Based on SLAM Map Planning and UWB Technique

05/2021-12/2021

*Key Member; Project for National Innovation and Entrepreneurship Training Program for College Students & “Challenge Cup” capital college students entrepreneurship plan competition of CCNU*

- Learned and developed Raspberry Pi, learned ROS and deployed it on Raspberry Pi for simulation experiments.
- Built a Zigbee communication module to realize communication between robots. Enabled the robot's movement and obstacle avoidance by integrating the data of voice recognition, infrared laser, gyroscope and other sensors.
- Trained the Yolo V5 model in virtue of the products' image data autonomously collected by the camera and deployed the program to the Raspberry Pi to implement the robot's real object recognition.

## PROJECT EXPERIENCE

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### OTTO - Multi-Objective Recommender System

11/2022-02/2023

*Silver Medal at Kaggle Competition, **top4%**, 2587 teams worldwide*

- Used multiple recall methods to identify the top 200 items that are most likely to be clicked/favored/purchased.
- Established a word2vec model, vectorized and coded the products. Established a product similarity matrix, based on the user's click behavior sequence from the real data in the German OTTO e-commerce platform.
- Constructed a series of characteristics of items, users, and item-user dimensions based on the recalled items.
- According to the status of the product, labeled the recalled data with 0 or 1. Established a LGB binary classification model, and selected 20 product IDs with the highest prediction probability.

### Human Phone Usage Recognition on Streets Based on OpenPose

12/2021-05/2022

*Project Team Leader*

- Proposed the design ideas and the implementation approaches for the whole project based on extensive reading of literature on human body posture recognition and relevant algorithms.
- Selected 9 joint points of the upper body based upon the posture features when pedestrians are using mobile phones and conducted feature extraction of the distances between joints and angles connecting joint skeletons.
- Trained model on a collected human posture dataset with 10000 images, reached 91.2% accuracy of mobile phones' usage detection based on live cameras, and verified their validity in complex traffic environment.

### Optimal Decision-Making in Water, Land and Food Nexus based on Machine Learning

07/2021-02/2022

- Developed a machine learning model with the objective of maximizing wheat production while considering technical parameters of agriculture production, climatic stress on water resources, and land limits.
- Utilized an Extreme Learning Machine approach and incorporated root-mean-square error as an error criterion and Pearson's coefficient as a correlation index of variables.
- Evaluated the impact of the sustainable model based on criteria such as the harvest index, length of the growth period, cultivation costs, and irrigation water. Proposed a method that can serve as a virtual cropping model by adjusting the area under cultivation, leading to increased yield production.

## HONORS & AWARDS

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<b>Silver Medal</b> at OTTO - Multi-Objective Recommender System Competition ( <b>Kaggle top4%</b> , 2587 teams)	02/2023
<b>Second Prize</b> at the national level in the 16 <sup>th</sup> <b>China College Students Computer Design Competition</b>	06/2023
<b>First Prize</b> at the national level in 2022 <b>China Robot Competition &amp; RoboCup China Open</b> (dancing robot)	07/2022
<b>Second Prize</b> at the national level in 2022 <b>China Robot Competition &amp; RoboCup China Open</b> (creative robot)	07/2022
Second Prize at the national level in 2021 National College English Translation Competition	12/2021
First Prize at the national level in 2021 China College Students Employability Competition	11/2021

## SKILLS & LANGUAGES

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**Programming Languages:** Python, C/C++, JavaScript

**Framework/Development platform:** Pytorch, Linux, ROS

**Embedded hardware:** Jetson Nano, Raspberry Pi, Arduino

**Mechanical Design Software:** SolidWorks, 3ds Max

**Images/Video Post-processing:** Photoshop, Premiere Pro

**Languages:** Chinese (native), English (IELTS:7.0)