JIAYI WU

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EDUCATION

University of Florida *Gainesville, FL, US*

M.S. (Thesis) in Electrical and Computer Engineering GPA:3.83 *Aug. 2021- Present*

- Advisor: Prof. Md Jahidul Islam
- Courses: *Computational Photography, Fundamentals of Machine Learning, Pattern Recognition, Formal Methods Robotics & AI, IoT Security and Privacy, State Variable Methods in Linear Systems, Computer Communications, Wireless Networks, Research for Master's Thesis*

Zhejiang Sci-Tech University (ZSTU) *Hangzhou, China*

B.E. in Mechatronic Engineering GPA: 86/100 *Sept. 2017- Jun. 2021*

- 2021 Outstanding Graduate, Zhejiang Sci-Tech University

RESEARCH INTERESTS

- General Environment Vision and Multimodal Perception and Learning: Make computer vision systems more robust to the environment (scattering media, bad weather).
- AI-based Surgical Navigation: Make AI have the ability to generate structured diagnostic reports through medical images, and combine NLP algorithms and computer vision technology to achieve surgical navigation.
- Surgical robot: Enable surgical robots to have accurate multi-modal fusion perception ability and precise motion control and can perform precise surgery according to the instructions analyzed by doctors or AI.

PUBLICATIONS

[1] B. Yu, J. Wu, and M. J. Islam. **UDepth**: Fast Monocular Depth Estimation for Visually-guided Underwater Robots. **Has been accepted by IEEE International Conference on Robotics and Automation (ICRA 2023)**. [arXiv] [Code] [pre-print]

EXPERIENCES

Underwater 3D Reconstruction and Depth Estimation *University of Florida, Gainesville, FL, US*

Master's thesis *Jan. 2022- Present*

- Designed an underwater compatible SfM (Structure from motion) pipeline that enhances the robustness of terrestrial SfM to scattering medium environments.
- Formulated an novel domain projection module (RMI input space) for rough depth prediction for low-power embedded devices. Its mathematical part is used as a domain projection loss in Udepth to enforce the pixel-wise underwater attenuation constraints in the holistic learning process.
- Formulated a robust and efficient end-to-end model named UDepth, for fast monocular depth estimation by incorporating underwater domain knowledge into its supervised learning pipeline. One paper has been accepted by ICRA 2023.

Digital Audio and Video Algorithm Engineer in Vobile *Vobile, Santa Clara, CA, US*

Summer Internship *May. 2022- Aug. 2022*

- Developed and implemented a learning-based video retrieval system based on global feature and local feature fusion. And also wrote the user manual and targeted model performance optimization guidelines document of the system.
- Conducted a number of qualitative phase-shift auditory tests and found a relationship between the phase-shift cases and the psychoacoustic model.
- Upgraded the audio fingerprint encoding algorithm based on the classic psychoacoustic model. The upgraded algorithm can encode not only the sound pressure level of the audio fingerprint but also the threshold of its phase shift. (Implemented in C and MATLAB)

Python Toolkit Development in Remote Sensing Lab *University of Florida, Gainesville, FL, US*

Graduate Student Assistant *Jan. 2022- Present*

- Completed 3D model generation code packages for corn and soybean plants, the packages can load data from the database and automatically generate 3D models of plants in large batches.
- Toolkit updates and optimizations for speed and data irregularities.

Low-cost Driverless Car Automatic Charging Docking System *ZSTU, China*

Independent inventor (Undergraduate Graduation Project) *Dec. 2020- Jun. 2021*

- Completely self-designed a set of low-cost automatic charging solutions for driverless cars.
- Independently designed a low-cost and expandable spatial location acquisition module, and applied it on the prototype.
- Completed the prototype independently, and fully realized the automatic docking and communication functions of the automatic charging pile and the car charging port.
- Graduation design works were invited to participate in the National Engineering Graduation Design Competition and won the first national individual award (only two people in the country won this award).
- For this system, a national invention patent (An automatic charging system and charging docking method for an unmanned vehicle) has been applied for and is in the approval stage.

Parallel Wire robot (PWR) Research Project *ZSTU, China*

Participant *Oct. 2019- Nov. 2020*

- Joined in a research team focusing on the study of parallel wire robot.
- Designed a closed-loop control system in MATLAB and conducted simulation.
- In charge of collecting kinematics information of robot’s actuator by matrix operations
- The production of PWR was basically completed based on our design.

The *Challenge Cup* Extracurricular Academic Works Competition *Hangzhou, China*

Project Leader *Dec. 2018- Jul. 2019*

- Led a team to design a hand rehabilitation training robot that helps the elderly people treat and restore their physical functions of hands.
- Designed an integrative multicavity software driver which fits multi-posture movement of hands and made pressure sensor and bending sensor to effectively promote functional reorganization and relieve muscle and knuckle atrophy.
- Built the rehabilitation model based on sEMG signal character parameters to realize real-time management of exercise data and make rehabilitation effectiveness measurable.
- Successfully made a demonstration model and won the third prize in the competition.

HONORS & AWARDS

SCHOLARSHIPS

Zhejiang Government Scholarship 12/2020

First Class School Financial Aid for Overseas Exchange Program 09/2019

Zhejiang Government Scholarship 12/2018

COMPETITIONS

Individual first prize in the National University Graduate Design Competition
(Only two people won this award nationwide) 06/2021

Provincial First Prize of National 3D Digital Innovative Design Competition 10/2019

Second Prize of National 3dds Competition Classic 09/2019

Third Prize of The 16th Zhejiang Province Mechanical Design Competition for College Student 06/2019

Third Prize of The *Challenge Cup* Extracurricular Academic Works Competition 04/2019

Second Prize of *Internet* + School Competition 04/2019

PROFESSIONAL SKILLS

PROGRAMMING

- **Proficient:** C, Python (TensorFlow, PyTorch, OpenCV, Open3d, etc), MATLAB
- **Familiar:** C++

SOFTWARES

- **Proficient:** MATLAB, ROS, SolidWorks, Ansys, SpaceClaim (by code), Altium Designer
- **Familiar:** Verilog, Catia, Labview

ACADEMIC SERVICES

- Reviewer for ICRA 2023.