Zhiyuan Wu

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EDUCATION

Tongji University   **Shanghai, CN**
Bachelor Degree in Automation   **Sept. 2020 - Jul. 2024**
- **GPA**: 89.92/100
- **Supervisor**: Prof. Rui Fan ; Prof. Peng Qi

RESEARCH INTERESTS

Computer Vision in Robotics, Medical Robots, Stereo Matching, Scene Parsing

RESEARCH EXPERIENCES

Joint Optimization of Stereo Matching and Scene Parsing   Supervisor: Prof. Rui Fan
Research Assistant in MIAS Group, Tongji University   **Nov. 2021 - Present**
- Transparent Objects: A Corner Case in Stereo Matching (accepted by ICRA 2023)
  - Presented a transparency-aware stereo matching (**TA-Stereo**) strategy that significantly improves the accuracy of disparities on transparent objects.
  - Created a transparent object detection dataset including 260 RGB images and their pixel-level ground truth based on the KITTI Stereo 2012 and 2015 datasets.
  - Conducted extensive experiments with six SoTA deep stereo networks, five semantic segmentation networks, and two salient object detection networks to validate TA-Stereo.
- Exploring Joint Learning of Stereo Matching and Semantic Segmentation
  - Presented a framework for **joint learning** of stereo matching and semantic segmentation networks.
  - Utilized the disparity features and semantic features through a proposed data-fusion module for optimization to further combine the two tasks.
  - Proposed **a novel boundary loss function** tailored to enhance semantic segmentation and stereo matching performance.

Portable Robotic Devices for Autonomous Vascular Access   Supervisor: Prof. Peng Qi
Research Assistant in Venibot Group, Tongji University   **Mar. 2021 - Aug. 2022**
- Design and visual perception for venipuncture robot
  - Affected greatly by the COVID-19 outbreak, venipuncture robots were invented to reduce the working pressures and risks of cross-infection for medical staff.
  - Built 4-DOF and 6-DOF modular robotic arms to puncture, which are guided by the NIR and Ultrasound image segmentation algorithms.
  - Was featured on the front page of the 2021 **MIT Technology Review** and represented at the **ASME 2022 46th Mechanisms and Robotic Conference** (there were only four undergraduate teams) and the 2022 **"Challenge Cup"** Chinese College Students Entrepreneurship Competition, as **team leader** and **speaker**.
- Medical assistance for puncturing blood vessels
  - Aided in the creation of medical equipment and system for venipuncture robots, such as the automatic hemostasis system and the painless puncture needle.
  - These were published by the State Intellectual Property Office of China (CNIPA) as **invention patents**.

INTERNSHIP EXPERIENCES

Airfit (Shanghai) Heating Equipment Co, Ltd   **Shanghai, CN**
Research and Development Assistant   **Dec. 2022 - Feb. 2023**
- "Airfit Companion" Remote Controller App Development
  - Optimize the temperature control system with artificial neural network **PID** regulator;
  - Assist in participating in resource allocation and communication and coordination between teams in the whole process;
  - Responsible for R&D material or equipment procurement, management of R&D material warehouse and R&D equipment.

PUBLICATION

[1] **Zhiyuan Wu**, Shuai Su, Qijun Chen, Rui Fan. "Transparent Objects: A Corner Case in Stereo Matching" accepted by **ICRA, 2023**. (**First author**, [paper] [video] [code])

[2] Peng Qi, **Zhiyuan Wu**. "Feedback automatic hemostasis system for medical robot", **Invention Patents**, published. (**First student author**, [paper])

[3] Peng Qi, **Zhiyuan Wu**. "Automatic audit method, system, device and storage medium for multi-lane merge violations", **Invention Patents**, published. (**First student author**, [paper])

[4] Peng Qi, Hongyi Gao, Yiyuan Meng, **Zhiyuan Wu**. "Painless puncture needle and its painless puncture method", **Invention Patents**, published. ([paper])

CAMPUS EXPERIENCES

Member, Innovation and Entrepreneurship Club of Tongji University   **Mar. 2021 - Dec. 2022**
- Plan various group activities of the club, organized and coordinated and publicized the work.
- Responsible for the design and production of advertising banners, propaganda boards, propaganda posters, and invitations of the club.
- Participated in and organized the information exchange meeting of various related industries in the club.

Member, Student Union of Tongji University   **Oct. 2020 - Jul. 2021**
- Volunteer in a range of activities including Top 10 Singers Competition and New Year's Day Party.
- Provided service for the public and ensure the smooth running of the event.

HONORS AND SERVICES

First Prize in the Intelligent Robot Fighting and Gaming Competition   **Nov. 2022**
First Prize in the "Challenge Cup" Chinese College Students Entrepreneurship Competition   **Aug. 2022**
First Prize in the China International College Students "Internet+" Innovation Competition   **Aug. 2022**
Finalist Award in the 2022 ASME Student Mechanism & Robot Design Competition   **Aug. 2022**
Honorable Mention in the Dimension Cup National College Mathematical Contest in Modeling **Jan. 2022**
Second Prize in University Student Competition Five Minute Research Presentation   **Jan. 2022**
Reviewer of IROS 2023, ICCV 2023, and IEEE Transactions on Intelligent Vehicles (TIV)
Membership of IEEE and ICRA 2023

SKILLS

Languages	Chinese (Native), English (TOEFL 105: 28R, 30L, 22S, 25W)
Programming	Python, C++, C#, Matlab, MySQL
Libraries	PyTorch, OpenCV
Hobby	UAV