Jianhan Ma

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Education

- **University of California, San Diego** — La Jolla, CA, United States
  M.S. in Electrical and Computer Engineering — *Sep 2022 - Present*
- **University of Illinois at Urbana Champaign** — Champaign, IL, United States
  B.S. in Electrical Engineering; GPA: 3.44 — *Aug 2017 - May 2021*
- **Zhejiang University** — Hangzhou, China
  B.E. in Electrical Engineering; GPA: 3.79 — *Sep 2017 - June 2021*
- **Relevant Coursework**: Robotics & Control, Natural Language Processing, Computer Vision, Parallel Programming, Artificial Intelligence, Machine Learning, Data Structures, Data Science and Engineering, Algorithms

Research Interests

- Computer Vision, Self-supervised Learning, Deep Learning, Robotics

Skills Summary

- **Programming**: Python, C++, C#, Matlab, System Verilog, LaTeX
- **Tools**: Pytorch, Tensorflow, Robot Operating System(ROS), Unity, CoppeliaSim(V-Rep), Simulink, Quartus

Experience

- **Angelalign Technology Inc & Zhejiang University** — Hangzhou, China
  Research Intern - Supervisor: Prof. Zuozhu Liu — *Dec 2021 - Aug 2022*
  - **AI for Dental Care**:
    - Implemented a self-supervised representation learning approach to boost the accuracy of the semantic segmentation on a Cone-Beam Computed Tomography(CBCT) dataset, which is already integrated into the clinical software for reconstructing 3D dental models in Chinese orthodontics.
    - Established, trained, and evaluated an adapted pixel-level contrastive learning pipeline specialized for CBCT modality on a large-scale unlabled dataset(123,904 unlabeled CBCT images from 400 patients), achieved an average IoU of 91.33% for tooth labels in the subsequent transfer learning procedure that requires only 500 labeled CBCT images, which reduces the human efforts in clinical and industrial applications.
- **Zhejiang University** — Hangzhou, China
  Research Assistant - Advisor: Prof. Liangjing Yang — *Jan 2021 - May 2021*
  - **Robot arm based Augmented Reality Surgical Auxiliary System**:
    - Developed an Augmented Reality (AR) auxiliary system capable of tracking and tagging the tumor location and displaying it onto the vision of the endoscope installed on an OpenManipulator-X robot arm.
    - Achieved a low operative error by aligning the Unity virtual scene of the patient's tumor with the real scene captured by the endoscope controlled by the robot arm, providing a solution to helping the doctors locate the tumor inside the patient's body and reducing the risk of surgical accidents due to doctors' wrong judgment

Selected Projects

- **Analysis of Shared Vehicle Fleet for On-demand Urban Mobility**: Developed a demand prediction and supply regulation system for shared autonomous vehicle fleets within different Traffic Analysis Zones(TAZ). (Jun '19)
- **Decentral Smart Grid Control though Machine Learning Techniques**: Employed machine learning algorithms on a simplified model for the decentral smart grid control system to realize autonomous control, and eliminated some assumptions that over-simplifies the existing model. (Jan '19)
- **iCARE App Development**: Collaborated with front-end engineers to develop an App called iCARE, which is designed to detect user's age through his or her interaction with the mobile phone, so that the phone can automatically operate on appropriate modes for people of different ages accordingly (e.g. operates on the mode that blocks visits to adult-only websites when the phone is used by a teenager). (Jun '18)

Extra-curricular Activities

- **Teaching Assistant**: ECE 470 - Intro to Robotics (UIUC)
- **Teaching Assistant**: ECE 342 & 343 - Electronic Circuits (UIUC)
- **Teaching Assistant**: ECE 313 - Probability with Engineering Application (ZJU)

Honors and Awards

- UIUC Dean's list in 2019-2020 academic year.