# JIAMING LAI

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## EDUCATION

**University of California San Diego**, College of Electrical and Computer Engineering 2019.09–present
- M.S. in Intelligent Systems, Robotics, and Control
- GPA: 3.86/4.00

**Zhejiang University**, College of Control Science and Engineering 2015.09–2019.07
- B.Eng. in Automation
- GPA: 3.79/4.00

## SKILLS

**Programming/Software:** C++/C, Java, Python (NumPy, Pandas, scikit-learn), PyTorch, TensorFlow, MALTAB, ROS, Git.
**Strengths:** Knowledge of robotics, machine learning algorithm and deep learning techniques. Experience in neural spike trains and ECoG neural data analysis, software development for robotics system and embedding system.

## RESEARCH EXPERIENCE

**Research Assistant** | Advisor: **Prof. Vikash Gilja** (Associate Professor, **UCSD**) 2020.03–present
**Brain-machine Interfaces: Transfer Learning for Decoding Electrocorticographic Signals in Finger Flexion Experiments**
- Developed frequency power **feature engineering** on electrocorticographic (ECoG) neural data from sensory-motor cortex.
- Developed **multi-task** BMIs network for mapping spatio-temporal patterns in ECoG signals to finger trajectory regression and movement intent identification: a fully convolutional aligner for exacting **latent space** and a decoder for learning temporary feature propagation.
- **Transferred** the BMIs network across **multiple users**, improved the **performance** and **robustness** using domain adaptation.

**Research Assistant** | Advisor: **Prof. Guofeng Zhang** (Professor, **Zhejiang University**) 2019.02–2019.06
**Indoor Environment Mapping Based on Turblebot2 and Kinect2**
- Experimented with ORB-SLAM algorithm in 5 laparoscopic video datasets.
- Built **autonomous mobile robot system** based on Turblebot2, Nvidia Jetson TK1 and Microsoft Kinect2.
- Developed embedding system software on Jetson TK1 to navigate Turblebot2, analyze image and depth information from Kinect2 and build OctoMap 3D occupancy grid map by using ROS and C++. Achieved grid map **real-time** building.
- Optimized system software to improve **scalability** and **extensibility** for future growth.

**Research Assistant** | Advisor: **Prof. Rong Xiong** (Professor, **Zhejiang University**) 2017.10–2018.05
**ZJUDancer: Robot Team for KidSize Soccer Competition of RoboCup Humanoid League**
- Developed motion planning software for walking and kicking action for soccer robot using ROS and C++.
- Experimented software reliability with simulation using Gazebo and succeeded to deploy in **5** robot system.
- Achievement: our team achieved KidSize Soccer Competition **2nd Place** in RoboCup 2017 and 2019.

## PROJECT

**UCSD ECE276A: Sensing & Estimation in Robotics** 2020.01–2020.04
**Lidar+IMU Simultaneous Localization and Mapping (SLAM) with Particle Filter**
- Developed **particle filter** SLAM method to localize robot position and generate occupied map, by using IMU odometry data and 2D Lidar scan. Experimented in 5 datasets.
- Optimized software and increased **computational efficiency** by at least **70%**.

**Visual Simultaneous Localization and Mapping (SLAM) with EKF Filter**
- Developed **visual-inertial SLAM** method to generate IMU trajectory and landmark map: predicted IMU pose given IMU observation, projected visual features to world frame as landmarks given stereo camera observation and finally performed joint update of IMU pose and landmarks using **Extended Kalman filter**.
- Experimented in 3 large scale datasets, optimized and achieved **3x faster** computational performance.

## TEACHING EXPERIENCE

**Teaching Assistant** for ECE225A: Prob & Stats for Data Science by Prof. Alon Orlitsky 2020.09–2020.12