Luis M. Pimentel

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United States Citizen

Education

Georgia Institute of Technology, Atlanta, GA — January 2022 - present
Master of Science, Computer and Electrical Engineering — GPA: 4.00/4.00

Georgia Institute of Technology, Atlanta, GA — August 2017 - December 2021
Bachelor of Science, Computer Engineering, Minor in Robotics — GPA: 3.71/4.00

Georgia Tech Lorraine, Metz, France — August 2019 - December 2019
Study Abroad Program

Technical Skills

Programming Languages: Python, C++, C, MATLAB.
Robotics: ROS/ROS2, Gazebo, PX4-Autopilot
Software: Linux, Git, PyTorch, Python ML & Scientific tools/libraries, Google Cloud
Hardware: Robotics sensing technologies: camera, LIDAR, IMU; embedded systems and microcontrollers; strong electronics and prototyping skills
Communication: LaTeX, Jupyter, Git/Wiki documentation, design proposals, technical & research posters, technical & research writing

Selected Coursework

Machine Learning: Math Foundations of Data Science, Machine Learning , Deep Learning, Statistical Machine Learning*, Probabilistic Graphical Models*
Control Systems: Signals and Systems, Feedback Control Systems, Control System Design, Linear Systems and Controls* (IP), Networked Control and Multiagent Systems* (IP)
Robotics: Robotics and Autonomy, Robotics and Perception, Computer Vision
Other: Programming HW/SW Systems, Engineering Software Design, Digital Signals Processing, Digital Design

* indicates graduate level; (IP) In Progress

Professional Experience

Graduate Research & Development Intern — **Sandia National Laboratories**
Summer 2019, Summer 2020 - present — Albuquerque, NM
Manager: Dr. Julie Parish, **PI:** Dr. Zahi Kakish

* Designed and developed new multi-copter platforms with increased computational capabilities, and expanded the sensor suites for advanced autonomous flight. Contributed to establishing robotics infrastructure for an indoor multi-agent experimental test-bed.
* Developed software infrastructure for performing physical and simulated experiments aiding in the research and development of autonomous algorithms. Aided in implementing several algorithms related to optimal control, path planning, trajectory generation, and intelligence-aided navigation.
* Currently researching and developing multi-agent algorithms for advanced perception, navigation, and control using control using techniques from Control Systems and Deep Reinforcement Learning.

Undergrad Research & Development Intern — **Georgia Tech Research Institute**
Summer 2018 — Atlanta, GA
Manager/PI: Chris Roberts

* Designed and developed a custom communication system using four STM32 embedded systems. This system used a custom communications protocol to transmit/receive messages through radio frequencies.
* Developed software applications to identify security vulnerabilities within the hardware devices and peripherals.

Research Experience & Projects

Perception Software Lead — **Georgia Institute of Technology**
Spring 2021 - Fall 2021 — Atlanta, NM
PI: Dr. Micheal E. West

* Sponsored culminating design project with the task of designing an Autonomous Surface Vehicle (ASV) with the capability of eliminating plastic pollution in rivers.
* Integrating autonomous capabilities of an ASV for plastic detection, localization, and autonomous navigation. Integrated an underwater stereo camera for plastic detection and localization using real-time deep learning based object detection algorithm and 3D point-cloud data.

Undergraduate Research, Special Topics — **The Dream Lab, Georgia Tech Lorraine**
Fall 2019 — Metz, France
PI: Dr. Cedric Pradalier

* Wrote a software driver for operating an autonomous 1/10 th scale racecar robot used for control and state estimation research.
* Integrated the software and hardware components for state estimation through an Extended Kalman Filter using an RGBD camera, GPS, and IMU.

VIP Active Safety for Autonomous and Semi-Autonomous Vehicles — **Georgia Institute of Technology**
Atlanta, GA
Fall 2017 - Spring 2019
PI: Dr. Panagiotis Tsiotras

* Managed students on the team in setting semester goals, tracking progress, and communicating progress to PI.
* Built and maintained the hardware of three AutoRally platforms: 1/5th scale racecar robots used for research applications in autonomous control and perception.
* Built ten 1/10th scale racecar robots and developed software applications for an autonomous navigation stack using ROS to implement SLAM, path planning, and trajectory generation in simulation and hardware using onboard sensors such as IMU, LIDAR, and stereo cameras.

Workshop Papers

[W1] **Scaling Multi-agent Reinforcement Learning via State Upsampling**
Luis Pimentel*, Rohan Paleja*, Zheyuan Wang, Esmaeil Seraj, James Pagan, and Matthew Gombolay
In Proc. RSS Workshop on Scaling Robot Learning (RSS22-SRL), 2022

Leadership & Service

Boxing Club at Georgia Tech: Fall 2018 - Spring 2021
Founder and former President of Georgia Tech's first amateur college boxing team competing through USA Boxing and USIBA. Developed core club organization and operations, leading to growth of over 100 members within two semesters since founding. Organized team competition at the 2019 USIBA National Tournament in Syracuse, New York. Organized the 2020 USIBA National Tournament in Atlanta, GA, hosting over 20+ universities (cancelled due to COVID-19).

Georgia Tech Eta Kappa Nu (HKN): Spring 2021 - present
International IEEE honor society where I am involved in social, corporate, and service events.

Georgia Tech RoboJackets: Fall 2017 - Spring 2018
Worked in the software development and integration of sensors for race cars used in autonomous racing competitions. Competed in the 2018 Sparkfun Autonomous Vehicle Challenge in Boulder, Colorado, and the 2018 International Autonomous Robot Racing Competition in Toronto, Canada.

Honors & Awards

Sandia National Laboratories Employee Recognition Award 2021
Georgia Tech Tower Award 2017-2020
Georgia Tech Best New Organization of the Year Award – Boxing Club 2019
1st Place – Sparkfun AVC Speed Demons Competition (RoboJackets) 2018
Martin Marietta Scholarship 2018
GCAA Scholarship 2018
Hispanic Heritage Youth Award (Gold – Engineering) 2017
Hispanic Scholarship Fund Scholar 2017