Jorge Roa

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Profile

Motivated robotics and automation engineer with expertise in hardware, software, electronics, and electromechanical systems, passionate about leveraging AI to drive the future of automation and robotics. Experienced in CAD and 3D printing for prototyping and product development. Committed to continuous learning, innovation, and problem-solving. Proficient in working independently or leading teams to deliver cutting-edge technology solutions in fast-paced environments.

Education

08/2020 – 08/2022
College Station, USA

M.S. | Engineering Technology
Texas A&M University
Thesis: Design and Implementation of an Automated Asphalt Robotic Testing System

08/2017 – 08/2020
College Station, USA

B.S. | Mechatronics Engineering
Texas A&M University

01/2019 – 05/2019

Massachusetts Institute of Technology XPRO
An online additive manufacturing course on the fundamentals, applications, and business implications of 3D printing for design and manufacturing.

Publications and Awards

Co-Inventor on US Provisional Patent Application No. 63/421,360
Filed November 1, 2022, for "Automated Asphalt Testing Systems and Associated Methods"

09/2021

Ceramic Binder Jetting Additive Manufacturing: Effects of Powder Particle Size Distribution on Density.
Journal of Manufacturing Science and Engineering
https://doi.org/10.1115/1.4050306
- Collaborated with multiple PhD students to research and manufacture multimodal powder feedstock for Binder Jetting Additive Manufacturing.
- Conducted data collection through various experimental methods and analyzed analytical models to investigate the packing density of ceramic feedstock.
- Led and managed a team of 8 undergraduate students in designing, developing, and constructing a custom Binder Jetting 3D printer, aimed towards advancing research in biomedical applications of high-density ceramic parts.

08/2020

First Place SHELL-ECO Marathon Autonomous Competition
https://engineering.tamu.edu/news/2020/09/texas-am-engineering-student-team-wins-shell-eco-marathon-global-competition.html
- Participated as team leader for the Texas A&M Team. In charge of the PID controls of the simulated car. Software would be subscribed to ROS topics from values generated from path planning, perception, and control algorithms for an autonomous vehicle.
- Lead testing and optimization of the autonomous vehicle in Microsoft AirSim with Unreal Engine.

10/2021

First Place Techaton Engineering Competition
Placed first in a 36-hour competition by designing and successfully implementing a battery powered device to measure stress levels of a police officer during a traffic stop.

⬛ Work experience

08/2022 – present
College Station, TX, USA

Research Scientist
Texas A&M Transportation Institute
- Invented and patented an advanced automated robotic asphalt testing system, sponsored by TxDOT. Led hardware, software, and electronics development with exceptional results.
- Developed a complete Linux-based robotic software ecosystem, including a user-friendly Python3 and PyQt5 UI, IoT communication, multi-threading, and custom C++ machine control code. Implemented multidisciplinary projects on time, from prototype to product.
- Showcased hands-on design engineering expertise through CAD modeling, mechanical assemblies, complex electronics boards, protoboards, PCBs, and power electrical systems.

06/2021 – 08/2022
College Station, TX, USA

Graduate Research Assistant
Texas A&M University
- Conducted research on robotics and automation within the transportation sector, leveraging innovative technologies and robotics to transform manual testing processes into efficient, automated solutions.

01/2020 – 06/2021
College Station, TX, USA

Graduate teaching assistant
Texas A&M University
- Developed sensor feedback controls, path planning strategies, and maintained 30+ mobile robots while creating teaching materials, instructional videos, and software documentation; taught, supervised, and graded 60+ undergraduate students in five Mobile Robotics Laboratory sections.

01/2020 – 12/2020
College Station, TX,USA

Undergraduate Teaching Assistant
Texas A&M University
- Successfully instructed over 60 undergraduate students per semester in the Mobile Robotics laboratory, utilizing virtual teaching methods.
- Devised and implemented an innovative virtual platform for teaching mobile robotics remotely during the COVID-19 pandemic.
- Assisted with the development of course materials, grading assignments, and providing feedback to students.

⬛ Other Experience

Open-Source Mobile Robot Platform Collaborator
https://www.scuttlerobot.org/team/
- Designed and implemented sensor feedback controls for differential drive robot to optimize path planning. Wrote teaching manuals and produced instructional videos on YouTube for an open-source teaching platform
- Created comprehensive software documentation to facilitate user understanding and ease of use.