Jacobus Matthee

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Education

08/2017 – present

B.S. in Mechanical Engineering | Spring 2021 | University of Texas at Arlington
GPA: 3.84
Recipient of Maverick Academic Scholarship
Recipient of Igor Fraiberg Endowed Scholarship

Technical Skills

- Proficient in MATLAB, Python, and C++
- Confident with 3D Computer Aided Engineering (CAE) concepts and software, specifically SolidWorks
- Well-versed in Finite Element Analysis (FEA) concepts and software, specifically ANSYS
- Experienced with Arduino microcontrollers, DC motors, sensors (sonar, encoders, etc.) and other electromechanical devices
- Comfortable with Linux Operating System environment
- Experienced with open-source robotics software and middleware, including the Robot Operating System, Gazebo, and RViz

Work Experience

01/2021 – 05/2021

Research Assistant
Guidance and Control of Autonomous Systems Laboratory | University of Texas at Arlington
- Designed and built an unmanned ground vehicle for lidar mapping and testing applications
- Utilized LeGO-LOAM (Lightweight and Ground-Optimized Lidar Odometry and Mapping) algorithms to develop a point cloud map of the area where the ground vehicle is being driven around in
- Communicated effectively to ensure that all involved parties were regularly updated with progress reports

06/2020 – 01/2021

Undergraduate Researcher
Aerospace Systems Laboratory | University of Texas at Arlington
- Created URDF model of lab rovers for successful simulations to be conducted within the Gazebo environment
- Utilized ROS middleware to successfully operate off-road model rovers and acquire experimental data
- Collaborated with graduate students as needed on projects that involve unmanned vehicle systems, path planning and obstacle avoidance algorithms

01/2019 – 01/2021

Student Associate/Tutor
I.D.E.A.S. Center | University of Texas at Arlington
- Facilitated daily STEM tutoring/mentoring sessions with students
- Employed interpersonal skills to explain engineering concepts to students from a variety of backgrounds and learning styles

Projects

Unmanned Ground Vehicle with Lidar
- Built a six-wheeled ground vehicle for object-avoidance applications
- Integrated multiple sensors – including a Velodyne VLP-16 lidar, IMU, and multiple encoders – for successful localization and mapping to take place within the testing area
- Strengthened knowledge of ROS and how to utilize it for efficient data collection and communication between the platform's different software components
- Developed practical electronics-related skills such as soldering and effective battery management

Simulation Model | Unmanned Ground Vehicle

- Modelled an unmanned ground vehicle in SolidWorks and created the needed URDF model for simulations to be conducted
- Utilized kinematics and dynamics principles to accurately simulate rover behavior when certain velocity or position inputs were provided to the vehicle

Senior Design Project | Stair-Climbing Robot | Testing Platform

- Led the Electronics team in developing a testing platform where all hardware components and software could be tested, integrated, and refined before being implemented on a final robotics platform
- Programmed and implemented a basic obstacle-avoidance algorithm for the platform using data from ultrasonic sonar sensors