Kedar More

Robotics and Controls Engineer

A professional Robotics and Controls engineer with a background in Mechanical Engineering. An innovative person with a passion for learning the latest technological advancements.

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WORK EXPERIENCE

Controls Engineer
Muller Technology

06/2021 - Present *Fort Collins, CO*

Leader in providing custom solutions for thin-walled plastic packaging.

Achievements/Tasks

- Created programs for custom assembly line machines as quoted by the top manufacturers of the packaging industry on OMRON Sysmac Studio (PLC and HMI).
- Developed a new system of HMI pages which could visually take you to the parts of machine you want to supervise and make the required changes. This drastically improved the user experience of the technicians working on it.
- Worked on Staubli 6-axis robots to fulfill the speed requirements for some applications with a lot of products going through the process which reduced the time by 20%.
- Certified with Staubli CS9 Programming Level 1 (Staubli Robotic Suite and safety).
- Certified with OMRON Mobile Robot Programming and Fleet Management.

Teaching Assistant (CAD and Manufacturing)
University of Colorado, Boulder

08/2020 - 05/2021 *Boulder, CO*

Achievements/Tasks

- Conducted lab sessions with 25 undergrad students for ‘CAD and Manufacturing’ course and thought Solidworks from a basic to advanced level.
- Provided hands-on training to the students on CNC Lathe and Mill machines using techniques like turning, slotting, parting, absolute and incremental precision measurements to make aluminum products.
- Analyzed the final year projects through presentations and contributed some ideas for future development.

EDUCATION

Master of Science in Robotics and Control
University of Colorado, Boulder

08/2019 - 05/2021 *3.66 / 4*

Courses

- Algorithmic Motion Planning
- Feedback Control
- Linear Systems
- Advanced Robotics

Bachelor of Engineering in Mechanical Engineering
Mumbai Univesity

06/2015 - 05/2019 *7.2 / 10*

SKILLS

Omron PLC and HMI | Staubli Robotic Arms Safety and Coding | Solidworks | Python 3 (numpy matplotlib, pandas) | C++ | OpenCV | Tensorflow | Keras | MATLAB | Omron AMR | Robot Operating System (rospy, roscpp) | PID

PERSONAL PROJECTS

Stabilize a Single Rotor at an input angle

- Constructed an assembly for an arm to rotate freely about an axis at one end and the other equipped with a single rotor.
- Programmed and studied the effects of different controllers such as P, PI, PID on the stability of the device.
- Created a model-based controller called variable PD and tested it to get a decrease in percent overshoot and settling time.

Path Planning Algorithms in python3

- Bug Algorithms: Bug1, Bug2, Tangent Bug.
- Continuous: Potential Functions.
- Discrete: Wavefront.
- Sampling Based: Probabilistic Roadmaps, Rapidly exploring Random Tree, A*, Dijkstra's.

Visualize and Control a virtual Inverted Pendulum with a single Motor Input

- Utilized Robot Operating System (roscpp) to simulate the motion of an Inverted Pendulum. The two nodes represented the controller and the physical pendulum.
- Setup the controller to take continuous feedback from the visualizer and give torque output to the motor.
- Tuned the controller with a PID control to best suit the physical pendulum and its perturbations.
- Perturbation angle can vary from -180 to 180 degrees.

Cockroach inspired Robot

- Designed a 6-legged robot which could be controlled using only 2 motors. The design was inspired by the motion of a cockroach that it undertakes while in search of food and while attacking its enemy.
- Applied a path planning algorithm called Bug1 to reach a source of light from a certain point in an obstacle environment.
- Bug1 is inspired by the food sensing ability of a bug and the tactile sensors in its antennae.

ABU Robocon

- Participated in Asia-Pacific competition ‘ABU Robocon’ and lead a team of 7 mechanical engineers to complete the tasks while working closely with the electronics and coding team.
- Frisbee throwing robot (manually controlled, frisbee could be thrown at a desired location accurately)
- Ball swinging robot (autonomous, used pneumatic systems)
- Quadrupedal robot (autonomous, used linear actuators and accelerometer for feedback)