Guangping Liu

Nov 19, 2023

CONTACT
INFORMATION

Malden, MA, USA   Tel: (+1)7814989879
GitHub, My Profile   liu.guangp@northeastern.edu

EDUCATION

Northeastern University, Boston, MA, USA   09/2021 – 05/2023
Master of Science in Mechanical Engineering
GPA:3.76/4.0

Nanchang Institute of Technology,Jiangxi, China   09/2017 – 07/2021
Bachelor of Engineering in Mechanical Design, Manufacture and Automation
GPA: 3.17/4.0 (top 15%)

RESEARCH
INTERESTS

Assistive Robotics, Robot Control, Exoskeletons and Prosthetics

RESEARCH
EXPERIENCE

MATLAB App for treadmills: COM tracking and self-pacing control
Northeastern University,Boston,MA   05/2022 – 05/2023
Guided by Prof. Seungmoon Song

- Developed a MATLAB-based Graphical User Interface (GUI) to dynamically control treadmill speeds, achieving real-time synchronization with subjects' walking paces and tracking Center of Mass (COM) movement, culminating in a self-paced treadmill for research purpose.
- Established communication between instrumented treadmill sensors and MATLAB using a C++-based Software Development Kit (SDK), accessing force-plate data in real time.
- Implemented a self-pacing algorithm using a Sliding Window Kalman Filter and a feedback controller to estimate subjects' forward COM positions and velocities, adaptively adjusting treadmill speeds.
- Created a Kinect model to estimate lateral COM movement during steady walking, validating model precision against Qualisys Motion Capture System.

PROJECT
EXPERIENCE

Turtlebot-based SLAM and AprilTags Detection(Python/ROS)
Northeastern University, Boston, MA   03/2023 – 04/2023

- Established communication between a Turtlebot, equipped with an inertial measurement unit (IMU), a Raspberry Pi and a remote PC, leveraging Robot Operating System (ROS) for sensor data transmission and reception.
- Implemented simultaneous localization and mapping (SLAM) using multiple packages, including GMapping, move_base, and explore_lite to enable efficient robot navigation through various environments, obstacle avoidance, and occupancy map generation, with real-time updates visualized in Rviz.
- Developed a Python script to transform AprilTags from the camera frame into the map frame, providing a map of an unknown environment with 7/7 tags.

Feature Attribution in Predicting Survival on the Titanic(Pytorch)

Northeastern University, Boston, MA   11/2022 – 12/2022

- Implemented a neural network model to predict survival on the Titanic.
- Implemented integrated gradients, with PyTorch to estimate the importance of each feature in the model, finding the most important feature related to survival rate.

DC Motor Control by Simulink and Arduino IDE(Python/Arduino)

Northeastern University, Boston, MA   10/2022 – 11/2022

- Constructed Simulink code with a feedback control system to adjust the position of a DC motor, and compared experimental results with Simscape simulations.
- Developed and implemented an embedded code using Arduino UNO to regulate the speed of a motor, reducing the error rate, and significantly enhancing overall performance.

SKILLS

- Languages: Chinese (native), English (proficient)
- Programming: Python (Numpy, Pandas, SciPy, Pytorch), C/C++
- Software: ROS, MATLAB (Simulink, Simscape), SolidWorks, AutoCAD, Arduino IDE
- Operating Systems: Windows, Linux

HONORS AND REWARDS

- 2017 2018 Merit Student of the Year (2%). 2017 2021 Three times of the 2nd Class Scholarship (8%), two times of the 3rd Class scholarship (15%) NIT.
- Down-Type Cross-Type Small Parking Space won the 3rd prize of Jiangxi Mechanical Innovation Design Competition.
- Rotary Lifting Parking Device Set won the 1st prize of the 8th National Mechanical Innovation Design Competition for College Students.
- Published a utility model patent named A Parallelogram Rotating Lifting Mechanism with A Crank Slider and A Triangular Upright Post.
- Massage Assistant Robot won the 1st prize of the 2nd Siemens Cup in NIT.