Kelvin Jaramillo

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Ecuadorian Mechanical Engineer with good experience in electronics and programming. Strong foundation in with MATLAB, Simulink, python and java. Good understanding of sensors, motor drivers and computer vision.
I offer a good understanding on how the mechanical, electrical and software domain must be synchronized in time to form part of a high-tech system

EDUCATION

BSc University of Twente July 2021
Mechanical Engineer

Holland International Study Centre June 2021
Foundation Year

High school Mejia, Ecuador
Science

HONORS AND AWARDS

SENESCYT Scholar 2018
Obtained a 960/1000 in the standard university entry test, which gave me the chance for a Full scholarship for my bachelor in the University of Twente

PROJECTS EXPERIENCE

Mirror-manipulator
Feedforward controlled precision mechatronic system with leaf springs guidance

- SOLDIWORKS for designing and obtaining inertial properties for mathematical model
- Simulink for obtaining model from Bode plot response, tune PID feed forward parameters
- SPACAR (MATLAB package) to obtain properties of leaf springs

Robot to travel through maze
PID controllers - Distance sensors for self-guidance

- Distance sensor to avoid obstacle and self-guide
- Second order receiver with filters to listen to the goal transmitter that the robot must go to

Server-client Collecto board game (JAVA)

Virtual board game with Client-Server architecture with socket communication

- UML diagrams used to design the software with Object Oriented Programming
- Write protocol to receive clients and handle them in different threads
- Server send movements during play to the clients, so that they can update their boards as well
- Develop AI algorithm in three level: easy, medium and hard (min-max)

Collecto board game with PYTHON and OpenCV

Same board game than above but written in python and the goal of developing further the min-max algorithms and test speed with different board sizes

- MinMax algorithm
- Game developed with PyGame library and following Object Oriented Programming architecture
- OpenCV to interact with game through hand gestures
- multithreading used to for camera reading without stopping the main game

Robotic serial manipulator for SPE

2 DOF robotic manipulator with electromagnetic end effector.

- User interface with Unity 3D, user can pick the object to be moved to the desired position
- Socket communication with python, reliable, fast and easy to apply. The user can be in another place, because only the IP is needed to initialize communication
- Python used to perform inverse kinematics, trajectory generation and serial communication with the Arduino MCU
- Trajectory is built with acceleration and deacceleration to avoid losing the magnetic object. This makes it possible to move the object at very high speeds
- Simulink and serial communication used to find transfer function for both links and tune the PID controller
- PID controller hardcoded by hand, as well as the reading and sending data from python server

Cable driven robot for SPE

2 DOF parallel robot manipulator with electromagnetic end effector.

- Using the software arquitecture of the 2 DOF serial manipulator above new hardware is designed with goal of simplifying computations for the trajectory and inverse kinematics
- 4 cables, DC motors and pulleys are used to pull the end effector and make it follow the desired trajectory
- This robot performs better that the serial robot and is less complex
- Real model and computer models must need to be precise otherwise the cables are pulled the incorrect amount

NOTE: for more information and projects please check my website.

LANGUAGES

Spanish: Native Language

English: Fluent

SKILLS

Programming: Good foundation and experience in: PYTHON/ JAVA/ MATLAB. Read and understand C#, JavaScript/html, C++ & C

Modelling: I have made multiple projects (simple and complex shapes) using SOLIDWORKS.

Sensors/ Circuits and Electronics: good understanding and experience of the electrical domain after a 10-week course with practical exercises for sensors (distance, force, capacitive, resistance, motor drivers) and 1st and 2nd order electric circuits (amplifiers and filters).

INTEREST AND HOBBIES

- ROS (Robotic Operating System)
- Brushless motors (controllers and drivers)
- Dynamic/Mechatronic systems
- Design and prototype
- Logic coding for robotic systems
- Embedded systems
- FPV drones