U.G.N. Kumara

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Education

University of Moratuwa – BSc. in Mechanical Engineering (3rd year undergraduate) Feb 2022 - Present

Projects

Automated Book Stocker

- Led a team of 9 individuals toward the goal of designing and developing a system to automatically store and retrieve books from a book shelf according to user input
- Data gathering and motor actuation was programmed using Arduino language with respective libraries
- Electric connections were simulated using online tools and then test models were built while using an iterative approach to fine tune actuator responses and sensor accuracy
- Entire physical system was modeled and assembled in detail using SolidWorks for communication purposes and it was used to identify practical problems that could occur when assembling it physically
- Major components were manufactured using available tools and the entire system was assembled, tested and presented to the evaluators successfully

Reverse Engineering of a Water Dispenser

- The product that was assigned, which is Refrigeration Chamber Enclosure was discovered to me made out of HIPS through several tests such as FTIR, density and hardness tests
- Dimensional data of the product was taken using standard metrology tools and they were used to produce a 3D model of the product in SolidWorks with great detail
- Product was proposed to reproduce using injection molding technique and dies required to obtain the desired shape were modeled using SolidWorks mold tools
- Fill and Pack simulation was conducted through SolidWorks plastics to observe the feasibility of manufacturing the product using injection molding and feasibility was confirmed by analysis of resulting 3D contour plots

Software Projects (Individual)

- Separate POS systems for communication and a mobile phone shop were developed using Java as programming language with MySQL employed as database management system.
- Several programmes to animate and visualize mapping of complex functions between complex domains were developed using Processing language.
- A programme to extract contours of images, turn them to a fourier sum through DFT algorithm and visualize redrawing of the image using fourier sums was developed using processing language and OpenCV
- Python programme to extract student results for different modules from pdf files, merge them into a one single dataset and calculate respective student's GPA and visualize results was developed using Jupyter Notebooks, pandas and Matplotlib
- MATLAB programme to calculate solutions to a given single and two DOF vibration problem (with initial conditions) and visualize the resulting motion was developed.

Skills

Engineering: SolidWorks, AutoCAD, Ansys Mechanical, Ansys Fluent, MATLAB, Simulink
Programming: C++, Arduino, Java, JavaFX, MySQL and Python, Processing, Javascript, CSS