



This portfolio contains detailed information about some of my projects and work experience in the design and development of products

## ReadyDock (Now called iCleanse)

iCleanse is a start-up that builds UV-C disinfection stations. I started of my career as an engineer here. Due to a lean staff, I held a wide array of responsibilities. I have briefly listed a few of these responsibilities below

### Product development

I extensively worked on the Swift XL and Swift 5X products to resolve service issues and optimize them for production. I have listed some key responsibilities

- Implemented design changes in product using CAD software like Solidworks.
- Adopted the FMEA methodology to improve on the design process to improve assembly and future serviceability of the product.
- Catalogued and recorded all service issues in the products to date. This data was later used to generate a service based revenue stream.
- Developed software features to improve the service life of the swift product

### Production and supply chain management:

After getting accustomed to the product, I worked in a team to manage the production and procurement of parts. Some of my related responsibilities are as follows.

- ♦ Updated the Bill of materials after every production run to reduce costs.
- ♦ Communicated with manufacturing companies and other suppliers in price negotiations.
- ♦ Planned production runs in a team of two and secured the necessary inventory for future production runs.

### Other responsibilities:

- Directly dealt with customers from different backgrounds to help resolve service issues.
- Developed testing equipment, plans and protocols to increase testing and assembly efficiency.



Swift XL



Swift 5X

## PRODUCT DESIGN AND DEVELOPMENT | WALLET DESIGN

Project was for partial fulfilment of Graduate Course on Mechatronics System Design

**GOALS:** The primary of goals of the project were to learn and adopt a set of methodologies and quality tools in the development of a product. The project was focused on adopting a holistic and systematic approach which would take into consideration user inputs, manufacturability and serviceability of a product.

### **IMPORTANT TOOLS USED:**

**Quality Function Deployment:** This tool was used to involve customer requirements and concerns into the design and service aspects of the product

**Failure mode affect and analysis:** This tool was used to identify and eliminate potential product and process failures or defects. The risks in a product were assessed with its severity, occurrence and detection.

**Design of Experiment:** Purposeful changes were made to the product's features in order to observe changes in desired outputs like service life, etc. Based on the information gained from the DOE (Design of Experiment) performance and cost effectiveness were improved

**Other Tools used:** Product brief, Voice of the customer, Pugh matrix, Morphological chart, etc.



Wallet prototype built using the methodology

## Autonomous gear shifting in bicycles

Project was for partial fulfilment of Graduate Course on Mechatronics system design

Project involved 100+ hours of combined work.

**DESCRIPTION:** The main goal of this project was to develop an autonomous gear shifting system for a bicycle. The system also calculated the optimal gear combination based on the cadence (Pedalling rate) being sensed. With the increase or decrease of cadence, the system tried to reach an optimum cadence of 80 by changing the gears in-order to do so. The motors were programmed for a specific angular deflection for every gear shift in order to replicate the twist shifters on the bicycle. I have highlighted some skills I used for the project below.

### **FABRICATION/MACHINE SHOP EXPERIENCE**

We designed a pulley system to reduce the torque required to change the gears by 75% of the original value. Some skills used in the process are mentioned below.

**3D printing:** We used SolidWorks to design some parts and then 3D printed them using the makers space.

**Fabrication:** Laser cutter, Ban saw, lathe, threading tools, drills etc., were used to create other subassemblies.

