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Project Portfolio

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# Design and manufacture oriented

## Project 1 – Bedside table

**Date:** 2013-2014

**Type:** Mechanical design and manufacture - carpentry

**Learnt:** Basic design and measurement. How to use various woodworking hand and machine tools. How to manufacture different types of joints (e.g. dovetail). Finishing techniques.

**Pictures:**

A wooden table

Description automatically generated A wooden box

Description automatically generated

A picture containing indoor, wall, floor, shelf

Description automatically generated

## Project 2 – Tax returns assistant programme

**Date:** 2016-2017

**Type:** Software design and coding

**Learnt:** How to design and build software. How to search for help and overcome software problems. Practical implementation of Object Oriented programming (OOP) in Java. How to build a graphical user interface (GUI). Basic communication with client regarding needs.

**Pictures:**

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

## Project 3 – Wardrobe

**Date:** 2019

**Type:** Mechanical design and manufacture – carpentry

**Learnt:** Identification of some types of wood. Processes to recycle and refurbish old materials. How to use more complex machine tools for woodworking (e.g. mill). How to select tools and processes based on needs. Manufacture design.

**Pictures:**

A wooden door

Description automatically generatedA picture containing building, indoor, floor, chair

Description automatically generated

A picture containing indoor, floor, wall, table

Description automatically generated A picture containing indoor, wall, floor, table

Description automatically generated

## Project 4 – General machining

**Date:** 2018 - present

**Type:** Mechanical design and manufacture - metalworking

**Learnt:** How to perform basic metalworking tasks on the mill and lathe. Hand tools for metalworking. Basic TIG welding. Interpreting mechanical drawings. Devising manufacture methods and managing manufacture. Teaching practical tasks to others.

**Pictures:**

A group of people riding on the back of a motorcycle

Description automatically generatedA picture containing person, ground, outdoor

Description automatically generated

Note: Placeholder picture only (made a similar part but took no pictures).



## Project 5 – F:SAE maps importer

**Date:** Late 2018 – early 2019

**Type:** Software and algorithm design and coding

**Learnt:** Using MATLAB to solve a complex, open-ended problems. How to use vectors in programming applications. Integrating software with pre-existing software. Using MATLAB toolboxes.

**Pictures:**

A close up of a map

Description automatically generated

A close up of a logo

Description automatically generated

## Project 6 – EG Whiter oil box and vise booster

**Date:** Early 2019

**Type:** CAD design and CNC manufacture

**Learnt:** How to perform proper parametric design in Creo Parametric. CNC machine programming, setting and operation. Full practical mechanical design including design for manufacture. Routine (oil box) and non-routine (vise booster) design.

**Pictures:**

### Oil box

A picture containing building, indoor, ground

Description automatically generated A close up of an engine

Description automatically generated

A close up of text on a whiteboard

Description automatically generatedA screen shot of a computer

Description automatically generated

A picture containing indoor, building, case

Description automatically generatedA close up of a machine

Description automatically generated

### Vise booster

A close up of text on a whiteboard

Description automatically generated A close up of text on a whiteboard

Description automatically generated

A close up of text on a white background

Description automatically generated A picture containing text

Description automatically generated

A picture containing indoor, floor

Description automatically generated A picture containing indoor, table

Description automatically generated

## Project 7 – F:SAE upright bracket testing jig

**Date:** Early 2019 - present

**Type:** CAD design, mechanical drawings, manufacture management.

**Learnt:** Design for testing. Producing drawings in Creo Parametric. How to specify requirements and communicate methods to inexperienced machinists. Teaching manufacture.

**Pictures:**

A screen shot of a computer

Description automatically generated A picture containing indoor

Description automatically generated

## Project 8 – M019 gearboxes

**Date:** Early 2019 - present

**Type:** Manufacture design and management

**Learnt:** Communication for manufacture. Making effective timelines and budgets for a multi-thousand-dollar critical subsystem. Effective team and outsourcing communication and collaboration. Delegation.

**Pictures:**

A picture containing indoor, floor, object, table

Description automatically generatedA picture containing indoor, wall, floor

Description automatically generated

A close up of a box

Description automatically generated

## Project 9 – Warman design and build competition robot

**Date:** Early 2019 - present

**Type:** Mechatronics design and manufacture.

**Learnt:** Practical electronics design, wiring and soldering. How to use an Arduino microcontroller and motor controllers. How to use a laser cutter. How to perform mechanical design in a team.

**Pictures:**

**A close up of a map

Description automatically generated** A picture containing table

Description automatically generated

**A close up of items on a table

Description automatically generated A picture containing indoor, wall

Description automatically generated**

## Project 10 – M020/M021 F:SAE Chief Engineer

**Date:** Mid 2019 – Feb 2021 (one of the longest serving Chief Engineers)

**Type:** Integration, management and mechanical design.

**Learnt:** How to manage a design team. Establishing higher-level design goals

### Project management and systems

Table

Description automatically generated

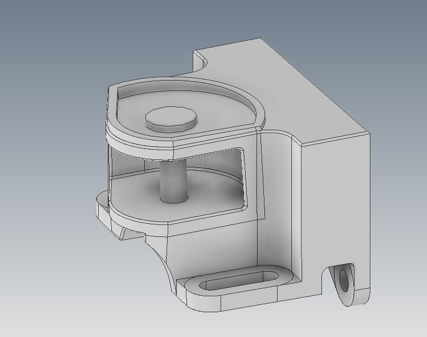
Autodesk Vault  
  
Systems design and integration   
  
Graphical user interface, website

Description automatically generated  
  
A picture containing LEGO, toy

Description automatically generated  
  
A picture containing text, toy

Description automatically generated

3D printed Ti64 brackets: design and manufacture

 A picture containing diagram

Description automatically generated  
A picture containing text, dryer

Description automatically generated A picture containing businesscard

Description automatically generated  
Diagram, engineering drawing

Description automatically generated

Project 11 – Autonomous F:SAE car  
**Date:** 2021

**Type:** Research and mechatronics design

**Learnt:**

**Pictures:**

(See other report)

Research, communication and presentation oriented

## Project 1 – Eureka science communication competition

**Date:** 2015

**Type:** Science and business communication

**Learnt:** How to establish a sound business case. How to communicate scientific knowledge to a non-scientific audience. Applying scientific knowledge to a novel design. Answering scientific application questions.

**Pictures:**

A group of people standing in a room

Description automatically generated

<https://www.youtube.com/watch?v=rkIjMVVjMQ4>

## Project 2 – Monetary policy challenge

**Date:** 2017

**Type:** Business and economics communication.

**Learnt:** How the world economy works and what role legislation plays in this. How to research current economic facts and produce a succinct business case. Managing a team of presenters. How to verbally integrate contributions and answer economic questions.

**Pictures:**

A group of people on a stage

Description automatically generated

## Project 3 – Thropy debating

**Date:** 2018

**Type:** Debating

**Learnt:** How to present a logical and well-reasoned argument. Improvisation and thinking on the spot. Preparation under time-pressure.

## Project 4 – F:SAE business presentation

**Date:** 2018 & 2019

**Type:** Business pitch and management consulting.

**Learnt:** How to pitch an engineering design to a varied audience. How to manage research. Incorporating humour for dramatic effect.

**Pictures:**

A group of people standing next to a person in a suit and tie

Description automatically generated

## Project 5 – F:SAE Chief Engineer Presentations

**Date:** 2020 & 2021

**Type:** Engineering design reviews and sponsor pitches

**Learnt:** How to present engineering designs for review, how to present to sponsors to entertain and inspire cash flow.

**Pictures:**A picture containing graphical user interface

Description automatically generated