

Mahat Parthiban

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Education

BSC Physics with Data science - Queen Mary University of London (*Ongoing, final year*)

- Final Project with CCMP on barocaloric material synthesis

A-Levels - Simon Langton grammar school for boys (*Sept 2020 - July 2022*)

- ABCC in Product design, Computer science , Maths , Physics
- A* EPQ artifact , *Designing an electric guitar*

GCSE - Simon Langton grammar school for boys (*Sept 2015 - July 2020*)

- 9 GCSEs including triple science
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Work Experience / Past projects

Bsc Physics final project , *Synthesising DABCO Oxalate for use in Barocaloric cooling systems.*
(ongoing)

- Worked in the wet chemistry lab, synthesising DABCO Oxalate using the layered solvent crystallization method, experimenting with different concentrations and ratios.
- Learned about the physical and chemical properties of crystalline structures and the physics behind caloric cooling methods.
- Performed PXRD analysis and analyzed data from differential scanning calorimetry
- Performed basic lab practises such as microscope use, writing risk assessments and learning about occupational health and safety.

Research coding project on Power system harmonics

(September 2024 - December 2024)

- Performed a long form research report on comparing different methods of identifying harmonics in power systems.
- Used python to create two algorithms, one using linear interpolation and the Fast Fourier Transform and one using the Lomb-Scargle method to create frequency spectrums to identify major harmonics in a set of real world data.
- Compared the two methods and evaluated the use cases for each.
- Calculated THD values for the data set and compared the efficiency and accuracy of each algorithm when exposed to non-uniformly sampled data

Private Tutor (GCSE and A-Level computer science, Python)

(*Ongoing since Sept 2023*)

- Demonstrated the ability to work without supervision, create my own schedule and keep up to date with the current academic material.

- Effectively communicated complicated academic topics to a younger audience.

Crossrail group project (EDT industrial cadets gold)

(January 2021)

- Designed a hypothetical high speed train line between Sydney and Canberra as an education project overseen by the engineers responsible for the Crossrail project.
- Created plans for a 15 stop train service by considering population data, budgets constraints and looking at the usage of existing railway lines.
- Calculated the feasibility of constructing multiple tunnels, overseen by an expert in TBMs.
- Calculated approximate construction costs and times and dealt with basic construction logistics such as types and amounts of equipment needed.
- Handled an additional task of keeping the project as environmentally friendly as possible and conducted research into creating an artificial island using the soil removed as part of the tunnel boring process.
- Selected to represent the school and the project as a whole at a national engineering conference that was canceled due to covid.

A- Level Design project (designing and making a portable electric guitar) (September 2021 - June 2022)

- Designed and built a fully functioning electric guitar that was capable of being easily disassembled and packed into a standard size carry on bag for commercial flights
- Created and followed my own workflow using Gantt charts
- Did extensive primary and secondary research and conducted market research to identify problems with existing products and identified problems with a client.
- Conducted destructive and non destructive materials testing to identify appropriate materials.
- Conducted research into traditional luthiering techniques, interviewed professional luthiers.

Technical Skills

Coding

- Proficient in Python 3 (Pandas, Numpy, SciPy, Matplotlib, Seaborn)
- Basic C++ skills
- R data analysis and manipulation

Design and Modelling

- Fusion 360 modeling for production and simulation , orthographics and designing for scale
- 2D design, designing for laser cutting and CNC applications
- Woodworking skills , (Luthiering) specializing in guitar fabrication and repair
- Machining skills including metal and wood lathes, laser cutters, 3 axis CNC, Resin 3D printing and routers
- Proficient in Blender, modeling for digital applications, Hard surface modeling, basic animation and simulation skills.

