

Maksymilian Mroczkowski

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Website: https://maks-mroczkowski.github.io/Personal-Website/portfolio_Project.html

Github: <https://github.com/Maks-Mroczkowski>

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PROJECTS

Convolutional neural network for medical image classification [Link](#) :

- Identifies MRI (Magnetic Resonance Imaging) scans as either “no tumour “ or “meningioma”
- The model was created using Python and Jupyter notebook
- TensorFlow’s ‘sequential model’ was imported along with Matplotlib for data representation
- The algorithm was trained with 1000+ images sourced from a certified medical MRI database
- The data set was split into validation / testing data sets (80:20 training testing split respectively)
- OpenCV was used to process the images. Image compression and segmentation was used
- The final model achieved ~97% accuracy

Rapid prototyping of medical robotics with Imperial College London [Link](#):

- Our final robotic arm was capable of lifting a mass of ~150g and had a reach of ~500mm
- I was elected as team leader for the project (team of 3 members)
- Our finished robot was able to reach a distance ~20% greater than class average and placed first when competing with 8 other teams
- Individual components were designed using CAD (Fusion360)
- Manufacturing techniques such as 3D printing and laser cutting were used to create the parts
- 3 Servos were programmed using Arduino unos and a variant of C++
- 3 prototypes were created within a 3 month period

Research study titled “Assessing wrist loading patterns and muscle activation during handstands” at Imperial:

- The research study analysed the biomechanics of handstands in gymnastics to help diagnose reasoning for long term wrist pain and injury in gymnasts
- Electromyography was used to measure muscle contraction and responsiveness for force distribution analysis
- Matlab and Python were both used to plot, visualise and analyse the data received from the EMG’s
- With the help of Matlab, hypothesis testing and various other statistical methods were performed on the data
- Motion sensors were placed on the participants body to generate a computer simulated “skeleton” model
- I was involved with assisting the PHD student in charge of the study with the data analysis and collection, and due to my background in gymnastics I was also a participant of the study

Linear Regression model with Imperial College Data Science Society [Link](#) :

- Predicts housing prices and how housing prices may change with varying distance from the coast in California
- The model was created using Python and Jupyter Notebook
- A linear regression model was imported from Scikit-Learn
- Factors such as longitude and latitude, total bedrooms and house value were accounted for in the model
- Collaborated with 4 members, all members came from different degree backgrounds
- The final model achieved a 95% confidence when testing data was used (80:20 training testing split respectively)

Personal Website [Link](#) :

- I self-taught myself JavaScript, CSS and HTML using courses on Udemy and FreeCodeCamp
- I built a dynamic and responsive portfolio website using my self-taught knowledge in order to display my projects
- Recreated Youtube.com using HTML and CSS

Imperial College Business School team project:

- Elected team leader for a research project with Imperial College Business School (team of 4 members)
- I delegated tasks to each member weekly and ensured each member was following the team schedule
- I arranged daily zoom calls with my team to check on our progress and answer any questions or resolve any issues
- The project involved creating an innovative business idea ("Brain-Computer Interface headset for analysing the concentration of customers) and creating a value proposition, business model, lean canvas and video pitch
- The project spanned a 2 month period
- Our group achieved a first, a score of 71%

First Year Final Group Design Challenge:

- Our group was tasked with designing a bioengineering inspired sustainable plant pot
- The plant pot optimises ideal growth conditions for the plant by implementing a LED ring light source and the built in reservoir in the plant pot allows for the recycling of water
- The pot was designed using CAD (SolidWorks) and the final design was 3D printed
- 3rd angle orthographic projection drawings were made of the plant pot
- LTspice helped visualise and test the implementation of the electronic circuit we made for the LED ring light system

EDUCATION

Imperial College London, UK (2023-2026)

- B.Sc Biomedical Technology Ventures (Bioengineering)

Richard Huish College, UK (2021-2023)

- A-levels: Mathematics, Chemistry, Biology

SKILLS AND ADDITIONAL INFORMATION

Skills:

- Polish, English, Russian, Slovak
- Data Structures and Algorithms
- Python, JavaScript, C++
- Machine Learning
- HTML, CSS, Web development
- CAD (Fusion360 & SolidWorks)
- 3D printing, laser cutting, rapid prototyping, electronics

Additional Information:

- Member of Imperial college Gymnastics, Imperial College Boxing and Imperial College Data Science Society
- Often placed in charge of assisting with training and leading the warm up of ~30 members in both gymnastics and boxing
- Frequently employed by Imperial College London as a student ambassador
- As a student ambassador, I've presented academic showcases to 150+ prospective students as a part of Imperial's recruitment and outreach scheme
- I've participated in Q&A panels answering the questions of 80+ students
- I am part of Imperials "Mom & Dad" scheme in which I am a mentor to first year Biomedical Technology Ventures students
- I regularly meet and socialise with my tutees, during which I often help them with problem sheets and give advise
- I am a self-employed private tutor, I tutor a variety of students ranging from GCSE to A-levels. I teach mathematics, further mathematics, chemistry and biology at A-level. I also work with students with learning difficulties
- I am a private boxing and fitness coach, who regularly helps train clients one-on-one