Maksymilian Mroczkowski

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Website: Link **Github: Link** **LinkedIn: Link**

PROJECTS

.png Image Processing Algorithm Link
•Extracts and decodes metadata (e.g., width, height, bit depth) and image pixel data using zlib decompression
•Implements advanced PNG filter algorithms (Sub, Up, Average, and Paeth) to reconstruct pixel data accurately
•Allows selective saving of images emphasizing individual RGB channels (red, green, or blue) in a customizable format
•Re-encodes and saves modified images in a compressed, CRC-validated PNG format
•Coded in Python, following Object-Oriented Programming principles

Convolutional Neural Network for Medical Image Classification Link
•Leveraged deep learning frameworks such as TensorFlow and Keras to design, train, and evaluate a convolutional neural network optimized for distinguishing brain tumor categories (e.g., "no tumor," "meningioma")
•Processed 1000+ MRI images from a certified medical database for model training and evaluation
•Incorporated tools like Matplotlib for visualizing data distributions, model performance metrics, and training progress
•Automated data preprocessing using OpenCV and TensorFlow to clean directories and filter non-image files
•Achieved ~97% accuracy on test datasets

Rapid Prototyping of Medical Robotics (Imperial College London) Link
•Led a team of 3 to design, prototype, and build a robotic arm capable of lifting ~150g with a reach of ~500mm
•Achieved a reach ~20% greater than the class average, placing first among 8 competing teams
•Collaborated with senior industry professionals to deliver well-documented, tested, and functional code
•Designed individual components using CAD (Fusion360) and manufactured parts through 3D printing and laser cutting
•Programmed 3 servos using Arduino Uno and C++, ensuring smooth and precise operation
•Iteratively developed 3 prototypes over a 3-month period

Research Study: "Assessing Wrist Loading Patterns and Muscle Activation During Handstands" (Imperial):
•Contributed to a biomechanics research project aimed at diagnosing causes of long-term wrist pain and injury in gymnasts
•Used electromyography (EMG) to measure muscle contraction and force distribution during handstands
•Analysed and visualised EMG data using Python and MATLAB, performing hypothesis testing and applying statistical Methods on the data
•Integrated motion sensor data to create a computer-simulated “skeleton” model of participant movements
•Assisted with data collection and analysis under the guidance of a PhD researcher, leveraging both technical expertise and firsthand experience as a study participant due to a background in gymnastics.

Linear Regression Model for Housing Price Prediction (Imperial College Data Science Society) Link
•Developed a linear regression model in Python (using Scikit-Learn) to predict housing prices in California and analyse price variation with proximity to the coast
•Incorporated features such as longitude, latitude, total bedrooms, and house value into the model for accurate predictions
•Collaborated with a diverse team of 4 members from different academic backgrounds
•Achieved 95% confidence on testing data with an 80:20 training-testing split

Personal Portfolio Website Link
•Self-taught JavaScript, CSS, and HTML through Udemy and FreeCodeCamp courses
•Designed and developed a dynamic, responsive portfolio website to showcase personal projects and skills
•Recreated the front-end of YouTube using HTML and CSS to apply my web development skills

First-Year Final Group Design Challenge: Bioengineering-Inspired Sustainable Plant Pot
•Collaborated with a team of 6 on designing a sustainable plant pot that optimizes plant growth using an LED ring light And a built in water recycling reservoir
•Designed the pot using CAD (SolidWorks) and produced a 3D-printed prototype
•Created third-angle orthographic projection drawings to detail the design specifications
•Utilised LTspice to model and test the electronic circuit 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

Student Ambassador (1/9/2024 - ongoing)
•Represent Imperial College London in outreach and recruitment efforts
•Presented academic showcases to 150+ prospective students and participated in Q&A panels for 80+ students
•Supported the 2024 undergraduate Biomedical Technology Ventures interviews
•Helped host multiple university taster and open days

In2Science Mentor (1/12/2024 - ongoing)
•Volunteer with In2Science, an organization aimed at empowering students from disadvantaged backgrounds to pursue careers in STEM
•I meet with my tutees on a monthly basis to provide academic support, discussed potential career aspirations, and share personal experiences to encourage personal and professional enrichment

Extracurricular Activities
•Active member of Imperial College Gymnastics, Boxing, and Data Science Society
•Frequently lead warm-up sessions and assist with training for ~30 members during gymnastics and boxing sessions

Mentorship
•Mentor for first-year Biomedical Technology Ventures students through Imperial's "Mom & Dad" scheme
•Regularly meet with tutees to provide academic and personal guidance, including assistance with problem sheets

Private Tutoring
•Self-employed tutor specialising in A-level mathematics, further mathematics, chemistry, and biology. I work with a range of students including those from disadvantaged and low income backgrounds and those with learning difficulties

Boxing and Fitness Coaching
•Provide one-on-one private boxing and fitness training to clients, helping them achieve personal fitness goals

Skills:
•languages : Polish, English, Russian, Slovak
•Strong grasp of data structures and algorithms
•Python, JavaScript, C++
•Machine Learning : Experienced with model development and data analysis
•HTML, CSS, Proficient in front-end technologies and creating dynamic websites
•CAD (Fusion360, SolidWorks), 3D printing, laser cutting, rapid prototyping, electronics