Sarthak Das

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Experience

IoT Developer (Mumbli); Shoreditch, London, (June - Sept 2022)

Programmed in C and Shell to create a help aid the installation process for acoustic measuring devices. Developed a pipline automatically configuring with Devialet Speaker systems API with Mumbli's becon technology, using a PID system to help venues and co-working spaces to generate the chosenvibe (Db level reading) of the area.

Dream Team (Imperial Collage London and Nick Munro); Kensington, London, (April 2022 –)

Created moulding and manufacturing techniques for a modular chocolate design. Worked with chocolate suppliers to develop a manufacturing and supply line to meet shipping requirements.

Undergraduate Teaching Assistant (Imperial College London); Kensington, London, (April 2022 –)

Assist teaching 1st year students at Imperial with their computing module assignments, teaching them Python, HTML, CSS, and JavaScript to help them create their own web-app.

Student Expert (Idea Lab); Kensington, London, (March 2020 –)
Managed maintenance of various equipment including CNC machines, IOT 3D printer farm, laser cutter. Training of assembling tooling equipment and day-to-day maintenance and debugging of software issues on the IOT system. Also assisted on encouraging students build and create personal projects and helping them in unfamiliar areas.

Grants Institute (Imperial Collage London); Kensington, London, (July - September 2021)
Built a high throughput sampling and cleaning system to allow for discretized sampling of an area to obtain concentration maps of pollutants. Repurposed a 3D printer wrote G Code controlling external electronic systems and electronics using Python and Raspberry Pi. Managed the electrical certification of the robot. Allowing studies to pinpoint the origin of pollutants in a fraction of the time, while presenting data in a format that can be overlayed with real-world data.

HSSMI and DETC; Stratford, London, (Jun - Aug 2017 & Jun - Aug 2018)
Developed a CAD to VR gaming engine pipeline, to help increase the work flow speed to viewing models in VR from hours to minutes, using Python to automate software such as Unity, Steam, Fusion 360.

Capgemini; Canary Wharf, London, (Aug 2018)
Used machine learning and developed correlation models to find and predict future correlation trends on large economic data sets.

Skills

Programming

HTML/CSS/JavaScript
SQL
Python (Computer Vision, ML, Flask)
Arduino(C/C++)
Go
Shell
Postman
Raspberry pi & ESP8266
G Code
MATLAB
MAX MSP

CAD and Rapid Prototyping

Fusion 360 (Generative Design and Sculpt)
Solidworks (FEA and CFD)
Adobe Illustrator and InDesign
Cura/Prusa Slicer
FDM printing
Keyshot

Education

Design Engineering MEng at **Imperial College London** (2020 -)

Modules Include: Robotics, Data Science, Industrial Design, Engineering Mathematics, Computing, Electronics, Gizmos, Solid Mechanics.

Present (Currently obtaining a first)

Westcliff High School for Boys (2013 – 2020)

A-Levels
A*- Computing
A* - Product Design
A - Maths
B - Physics

Notable Projects

BLOK-1 (Tangible Block Based Music Builder)

BLOK-1 (BL-1) is a multi-instrumental grid-based beat builder, allowing users to place blocks on a grid and for it to then recognize the blocks ID and position in the grid, using resistor ID's to identify the block and 84 'mico-voltmeters' to identify the location. Real time music processing was developed using C# and MAX MSP, utilizing multithreading and interrupts. The product was developed in line with industrial standards, with the injection molded design for the case, and PCB layout. This product allows music to be interacted in a more tactile way allowing children to develop a deeper understanding for the way sheet music translates

https://youtu.be/FgdZ7Vpq9qs

D-Light (6-Axis cabled parallel robot for drawing holograms with long exposure photography)

D-Light uses 8 stepper motors to move and end effector in 6 axis. Programmed in C# on an Arduino Mega; designed and optimized inverse kinematic algorithms for speed and space efficiency. Human interaction is done by utilizing an array of potentiometers to form a multi-dimensional joystick for natural and intuitive control.

https://youtu.be/F-UlYid7JYM

Digital Whiteboard (Low-cost smartboard using a Wii remote)

This project was to develop a new way of creating a cheap interactive smartboard to help give schools access to the technology without breaking the bank. This idea used a Wii remote that was repurposed and that communicated to a Raspberry Pi via Bluetooth to track the location of a pen. Using computer vision and AI for a complex but automatic calibration of the projector to screen.

https://youtu.be/XX-92G2blEU

Blakiston (Anti-Interference Turret)

This was a project in collaboration with Leonardo which sponsored us for the EES competition. I took the role of project manager and a lead in the programming department that allowed a system that could detect incoming threats and deploy a range of detergents to repel the threat while also noticing the owner. Used a Raspberry Pi, and Arduinos for a turret that will detect enemies through AI, and Lidar to detect moving threats. The case and housing was 3D printed and laser cut. This project won Innovation Award by Leonardo and won the national Technology, Design and Innovation Awards by the MTA 2019.

https://youtu.be/zaLumOOrBDA

Other Projects

- **Electric Dual Motor Skateboard**; Design and manufacture, ESC programming, soldering.
- **Web app Sudoku Solver**; JavaScript, rest-API applications, Front and Backend, property based testing
- **Quizai**; Uses ML to identify student topic weaknesses, and dynamically generate tests to help improve their weaknesses. Technology stack: Flask, SQLAlchemy, Python, MongoDB, Bootstrap.
- **AI Powered Gym App**; Uses AI prediction based of different exercises to recommend weights and track user muscle wear.
- **Virtual Classroom**; Programmed a VLE system for education. Won Essex Entrepreneurship Prize 2016
- **Custom Racing Drones**; Construction, wiring, PDE turning and flying, race for Imperial
- **Music Reactive RGB Lights**; Raspberry pi that streams music via Bluetooth with real-time frequency analyzing it change RGB strip
- **Self Balancing Segwey**; Using a custom built PID controller to balance a 2 wheeled robot while dancing to music