RAYAAN GHOSH

MECHANICAL ENGINEERING UNDERGRAD

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EDUCATION

Jadavpur University

B.E. Mechanical Engineering *Nov 2020-present*

Overall CGPA - **8.68**
Relevant Coursework
Fluid Mechanics, CFD, Structural Mechanics, Aerodynamics, SI Engine, Hydraulic Control Systems, Thermodynamics, Heat Power Cycles.

Salt Lake School

Higher Secondary (I.S.C.) *Apr 2018-Mar 2020*

Overall Percentage - **91.3**
Relevant Coursework
Science with Biology.

SKILLS

Programming Languages

Python | C/C++

Machine Learning Frameworks

Scipy | Tensorflow | Sci-Kit Learn | NumPy | Pandas | ONNX | OpenCV

Simulation Software

Solidworks | MATLAB | Ansys Fluent | Ansys Workbench

CERTIFICATIONS

- **Stanford Supervised Machine Learning: Regression and Classification** (Coursera)

INTERESTS

- Music
- Aerodynamics
- Artificial Intelligence
- Vehicle Dynamics

PROFILE

Adaptable and inquisitive, I thrive in challenging environments. A problem solver with a keen eye for detail, I approach tasks with dedication and a desire to learn. Strong communication skills enable me to collaborate effectively within teams. My proactive nature and passion for innovation drive my pursuit of excellence.

WORK EXPERIENCE

Flight Physics Mentee

Airbus *June 2023-Aug 2023*

- Worked as the **flight physics** team mentee to develop a **quadcopter model** for **no-control, longitudinally stable** forward flight.
- Used **OpenVSP** software to model several quadcopter models and determined flight stability through **aerodynamic analysis**.
- Wrote **Python** code to **simulate** the **flight trajectory** and **dynamic stability** of our quadcopter model in using **Matplotlib** library.
- Wrote a **fast iterator tool** to quickly test out different quadcopter **geometries** from the **computer terminal** in a **programmatic** way.

Research Intern

Indian Institute of Science, Bangalore
AMMPL Lab *June 2023-July 2023*

- **Simulated** a **multi phase Eulerian** model for **solidification** in **Ansys Fluent** CFD software.
- Modeled **Gaussian grain nucleation** for solidification using **experimental** parameters.
- Wrote **UDF macros** in **C language** for modeling **exchange phenomena**, **grain transport** and **grain growth equations**.
- **Validated research** paper results using the model to simulate **casting** of **Al-4Cu** material.

PROJECTS

Thermal Analysis and Design of a Cleanroom

Jadavpur University - Semester 5 Minor Project
Supervisor - Dr.Swarnendu Sen

- Conducted **literature review** to identify constructional and ventilation/airflow components of a **cleanroom HVAC** system and documented them.
- Conducted **market research** and evaluated **design criteria** for designing **ducts**, **heat transfer** for the cleanroom.
- Designed the cleanroom and calculated **heat load** of the structure assuming 50x50x10 feet dimensions.
- **Optimized** for the cheapest cost.

Spechio Face AI - CNN leveraged Skin Analysis and Product Recommendation Engine

- **Full stack web application** to detect facial skin tone and skin type parameters (dry , oily, acne prone, sensitivity) leveraging pretrained **EfficientNet CNN** architecture model.
- **Recommend** skincare products based on the **extracted parameters**.
- **One click user flow** from scanning face to getting personalized beauty products.
- Techstack- **Python, Sk-learn , OpenCV, ONNX ,Tensorflow, FastAPI** (backend), **React.js, Next.js** (frontend)

Neural Network powered Autonomous line follower robot

- Designed and constructed a **robot** using **Arduino UNO** with a cardboard body, 200 rpm 3-12V dual shaft motor wheels, and an **8-sensor IR array**.
- Developed a **neural network** (8 input nodes, 1 hidden layer, 2 output nodes) to **guide the robot's turns** based on IR sensor input.
- **Trained** the model using manual dataset to follow black lines
- Techstack- **Jupyter Notebook, Scikit Learn, TensorFlow, Numpy, Pandas.**