Harsh Mathur

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A tinkering enthusiast seeking to develop a culmination of skills in research and industry, all the while interrogating the workings of the world

EDUCATION

Duke University – Pratt School of Engineering | GPA: 3.825 **August 2022 - May 2026**

- Computer Science (B.Sc); Mechanical Engineering (B.Sc) – Aerospace Certificate
  - Computer Architecture **CS250**, Elements of Machine Learning, Graph Analysis with Matrix Computation
  - Mechatronics & Systems Controls - information processing, transient response analysis, signal-flow graphs
  - Solid Mechanics/Dynamics, Material Sciences, Aerodynamics

TECHNICAL SKILLS

Embedded Systems: C, Arduino, MIPS Assembly; Processes: Java, Python, R, SQL,VBasic, Git, Heroku; Web Stack: ES6, MongoDB, Express, Next, Node, Django. Mechanical: Matlab, LabView(PID); Game Dev: Unity; APIs: PyTorch, Autodesk 3D, Passport OAuth, mysql

RELEVANT EXPERIENCE

- **Backend Developer, Materials Data Repository MATD^3 | Duke Ab Initio Materials Simulation** **October 2024 - Present**
  - Developed optimization protocols in the open source MATD^3 directory, an **NSF-DMREF** funded project
  - Refactored installation code and starter configuration file for installation streamlining, boosting collaboration potential
  - Awarded the maintenance position of the open source project assisting the growth, outreach, and accessibility of development
- **Engineering Intern – Trio Labs** **June 2024 - September 2024**
  - Developed a Node.js web-application implementing the Autodesk Viewer API designed to isolate and view complex assemblies
  - Initiated the construction of an indigenous inventory management system utilizing Visual Basic for process automation
- **User Experience Engineer, GMetri XR (gmetri.com)** **October 2020 - February 2021**
  - Ideated, programmed, and deployed VR modules for multinational companies' engagement exercises – **Paypal, Accenture**, etc.
  - Developed data-driven design for VR-retail experiences for clients, including renowned fashion designer Manish Malhotra
  - Designed innovative VR integration boosting engagement rates by 2x-3x directly handled projects worth ~$38,000

PROJECTS

- **Streams - A Project Management App:** Designed and implemented a React.js application implementing MaterialUI and Google Charts API refactored to visualize the flow of a project through a sankey diagram; Created a multi-user dashboard environment with varying features for admin/user
- **Automated Certificate Generator:** Developed a Node.js application implementing pdf-lib API to generate certificates for participants at InYPT; Optimized server-side implementation by unlinking file created in the server domain after fulfilling client-requested promise
- **Fiedler Cut of Airline Networks Graphs:** Implemented scipy, networkx, and plotly for analysing the fiedler cut of various airline networks in the US; demonstrated the connectivities of airways and connected numerical metrics to interactable 3D graphs
- **flappyRasgulla - A Flappy Bird Clone:** Learned Unity through a WebGL Player implementation of Flappy Bird™, designed custom sprites to replace the bird with rasgulla (Bengali delicacy), tweaked physics metrics to synchronize with the new geometries
- **Windtunnel Project** - Designed and developed website utilizing EJS, BootstrapUI, and Express serving the plans for a self-fabricated wind tunnel backed with research references

HONOURS & AWARDS

- Awarded Duke Mechanical Engineering SMIF Innovation Grant for Material Science Research in Soft Robotics **(2024)**
- Appointed Engineering Student Government's Director of Tech - Designing web facilities for Pratt's Student Body **(2024)**
- Shortlisted for MIT Climate and Energy Prize, 2023; selected for presentation from a pool of 100+ startups **(2023)**
- Awarded the Bee-Keng Scholarship at Duke University's Pratt School of Engineering amount $300,000 over four years **(2022)**
- Top 20 Projects among 1000+ submissions; received India's only Mechanical Grand-Award-IRIS; Team India – ISEF **(2020)**
- Undergraduate Teaching Assistant - Control Of Dynamic Systems (Spring, 2025) | Laboratory Calculus - II (Spring 2024)

Mission Statement - I call myself a tinkering *enthusiast* because I'm curious to learn and apply them in areas that better lives. I spent my freshman summer in Manzini, Eswatini building a bridge over the life-taking Ngwempisi river. My sophomore summer was spent at a metal 3D printing firm that engineers parts at the micron scale for healthcare devices. I learned more about happiness, teamwork and purpose than I could have imagined from these experiences, and I'm excited to apply them in every venture that lies in my future.