

# 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: 3.806

(2022-2026)

- 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

**Skills** - Embedded Systems: C/C++, Arduino, MIPS Assembly; Processes: Java, Python, R, VBasic; Full-Stack Web Dev: React.js/MERN Stack, Figma; Mechanical Design - CAD: Solidworks, Ansys (Fluent), Fusion 360, Autodesk Suite, VR/XR: GMetri Engine, Unity

## RELEVANT EXPERIENCE

- **Backend Developer, Materials Data Repository [MATD<sup>3</sup>](#) | Duke Ab Initio Materials Simulations** (2023-Present)
  - Developed optimization protocols in the open source MATD<sup>3</sup> 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** (Summer, 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](http://gmetri.com))** (Gap Year, 2020-2021)
  - 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
- **Hardware Engineer – Duke Hyperloop** (2022-Present)
  - Developed software and embedded system for automated friction testing apparatus for flywheel braking mechanism
  - Fabricated the arduino microcontroller sensor array and control systems for braking and linear induction motor actuation

## DESIGN/ENGINEERING PROJECTS

- **Undergraduate Laboratory Assistant – Soft Robotics Lab | Pratt Engineering** (2023-Present)
  - Developed methods of fabrication of liquid matter channels embedded in stretchable polymers for soft robotics
  - Designed [linear actuation](#) machine utilising CAD, programmably actuated via arduino embedded system
- **Quality Control Manager, Nyawoluhle Bridge – [Engineers in Action](#) (DukeEngage)** (Summer, 2023)
  - Constructed and oversaw construction of the **longest suspended bridge** (122.2 metres) in Eswatini, Africa
  - Assisted in the dimensioning, surveying, technical design, and material flow strategies for structural components
- **Independent Aerodynamics Research – Turbulence Reduction/Wind Tunnel Design** (2019-2023)
  - Developed the [Windtunnel Project](#) website and repository of building plans for an open-circuit test apparatus for aerodynamics
  - Collaborated with India's finest research institution – IISc, Bangalore on analysis, [application](#), research methodology

## 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 - Developing 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)

## ACADEMIC PUBLICATION

Mathur, Harsh. "Low-Cost Method Qualitatively Verifying the Role of Blowing Jets in Improving Airflow across Airfoils Experiencing Flow Separation." *Journal of Emerging Technologies and Innovative Research* 8, no. 12 (December 31, 2021): 48–53.

**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.