

Samannoy Ghosh

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PROFESSIONAL STATEMENT:

I am a hands-on mechanical engineer with 8+ years of experience designing, prototyping, and testing mechatronic systems across robotics, UAVs, and medical devices. Skilled in CAD (SolidWorks), DFM, embedded integration, and full-cycle product development – from concept through validation. Experienced in leveraging mechanical design principles with electronic control to build reliable, scalable hardware for real-world applications. I thrive in fast-paced, cross-functional teams focused on iterative design and functional impact.

EXPERIENCE

Ph.D. Candidate, Rice University & University of Utah

(Jan '20-Aug '25)

- Designed and fabricated a **3D-printed ingestible robotic capsule** with embedded temperature sensing, BLE-based drug delivery, and optimized internal architecture for ~15 days of wireless sensing with onboard power
- Designed a novel **drug delivery mechanism** using cleanroom-deposited electroactive film, enabling on-demand remote actuation via custom Android App within ~25 minutes of system activation
- Prototyped an **electromechanical robot** using 3D printing and flex circuits, integrating ESP32, MOSFETs, power regulators, and linear actuators to **achieve autonomous gait adaptation over 54 training steps** using Q-learning
- Programmed and tested **embedded control logic for a continuous electrowetting system** – fabricated a wrist wearable 3D-printed pumping device and demonstrated prolonged actuation for up to 9 hours
- Engineered a **microfluidic ink mixing platform** for tunable in situ ink formulation; performed **OpenCV-based image analysis** of nanoparticle print patterns and trained ML classifiers (**SVM, Random Forest in scikit-learn**) to detect deposition features with up to 82% balanced accuracy
- Conducted materials characterization using **Scanning Electron Microscopy (SEM) and Stylus Profilometry** to analyze the thickness of printed drops; Performed **Fluorescence Microscopy** to image printed QD patterns
- Mentored and trained 240 senior-year students (across 4 semesters) in capstone execution, engineering communication, and industry-relevant product-focused development for real-world applications
- Created a web dashboard to display COVID-19 info scraping data from online sources (for Intro to Programming course) [Link](#)

Programmer Analyst, Cognizant Technology Solutions India

(Nov '17- Nov '19)

- Developed and deployed Salesforce-based web applications across 40+ APAC countries, improving accessibility and operational efficiency for healthcare training and B2B e-commerce platforms
- Coordinated with UI/UX, QA, and deployment teams to manage user acceptance testing, and go-live support for customized modules under fast-paced client timelines in Agile project environment

Undergraduate Researcher, Maulana Abul Kalam Azad University of Technology

(Aug '14- Nov '17)

- Built autonomous multi-terrain rovers and aerial surveillance and disaster rescue platforms under 10 lb., optimizing size, weight, and power to achieve about 20% more flight time than commercial RTF (Ready-To-Fly) kits
- Spearheaded development of a tethered aerial drop mechanism for a sub-3 lb. rover — leading CAD/CAM design, applying DFM principles, and overseeing prototyping, material selection, and field validation
- Led our project team to success in 15+ intra-city robotics competitions; awarded “Best Demonstration” at Kolkata Mini Maker Faire 2018 from among 200+ teams
- Mentored 20+ juniors on embedded programming, mechatronics integration, and system-level design for robotics fests and university showcase events
- Interned in basics of satellite broadcasting and high power AM/FM transmitters at All India Radio, Kolkata

Hands-on Projects and Prototyping

- Built a smart home automation prototype integrating voice and motion control, designed for user-centric assistive home use cases; focused on hardware-software interface and wireless control through Android app
- Assembled a palm-sized GPS/IMU-enabled PCB quadcopter; performed SMD assembly, soldering, and fabricated a custom PID tuning test fixture to validate flight control responsiveness
- Fabricated a custom flight control board tailored for tiltrotor and VTOL fixed-wing systems; Planned for hardware-in-the-loop testing before real-world flight test and validation
- Programmed a custom ground control station for real-time telemetry display from RC aircraft [Link](#)

SKILLS & ACTIVITIES

- **Embedded Systems:** Analog and Digital Circuits, Microcontrollers, Arduino, Raspberry Pi, ESP32, FPCB/PCB Design (Eagle), Power management Circuits, Sensor & Actuator Integration
- **Mechanical & Product Design:** CAD (SolidWorks), 3D Printing, GD&T aware, Design for Manufacturability,

- Mechatronic Systems Design and Assembly, Rapid Prototyping (FDM/SLA), Embedded Hardware
- **Programming & Data Analysis:** Python, Embedded C/C++, MATLAB, Java, Computer Vision, NumPy, Pandas, Scikit-learn, Data Visualization, Web Design (HTML, CSS, JS)
 - **Software Tools:** Microsoft Office, Adobe Illustrator, Visual Studio, Salesforce, Android Studio (basics)
 - **Technical Communication & Collaboration:** Mentoring, Project Management, Engineering Documentation, Technical Writing, Presentation Skills, Cross-Functional Teamwork

LEADERSHIP EXPERIENCES

Graduate Student Advisory Council, The University of Utah (Jan '20 – Present)

- Worked with team to address graduate school-wide policies, student resources, and finances
- Volunteered and helped with organizing Graduate Visitation Week for 5 years

Capstone and Robotics Team Leader, Institute of Engineering & Management (Jan '14 – Aug '17)

- Coordinated and collaborated with 4 members on 20+ robotics technical fest events
- Designed multiple ground rovers and mentored 20+ juniors on autonomous line follower robotics
- Conceptualized, designed, and led the capstone project on an autonomous hexacopter platform

Webmaster and Camp Organizer, IEM SPIE Student Chapter (Dec '15 – Dec '16)

- Organized 4 DST (Department of Science and Technology, India) sponsored 'Inspire' Science Camps to motivate high school students to take up careers in science
- Organized 2 Outreach Programs in rural schools to teach young students the basic principles of physics
- Designed and maintained online applications and web platform for the student chapter

TEACHING & MENTORING EXPERIENCE

Lab Instructor, Intro Design for Engg Systems (MEEN 1000) The University of Utah (Fall 2020)

Taught SolidWorks fundamentals and GD&T-ASME Y14.5 standards in hands-on lab setting to 100+ students

Teaching Assistant, Engineering Design I & II (MEEN 4000/4010), The University of Utah (Spring 2021, '22, '23, '24)

Guided 240+ students through project execution, design reviews, and technical reporting

Lab Instructor, Additive Manufacturing (MEEN 6011), The University of Utah

Trained students on FDM/SLA 3D printers and guided them through executing fabrication-based studies

Mentoring undergraduate volunteers, The University of Utah and Rice University

Mentored undergraduate volunteers in experimental design, prototyping, and hands-on research workflows

Graduate Mentor for RAMI Undergraduate Fellow, Rice University (Summer 2025)

Supervised the development of an adaptive microextrusion 3D printing platform, guiding hardware and software modifications to enable real-time adjustment of print parameters based on output pattern analysis

EDUCATION

Ph.D. in Mechanical Engineering, Rice University, Houston, TX, USA | [Google Scholar](#)

GPA: 4.0

Received fully funded offer for Ph.D. | RAMI Graduate Mentor

M.S. in Mechanical Engineering, The University of Utah, Salt Lake City, UT, Dec 2022

GPA: 3.747

Received Utah GSTAA travel award of \$500

B.S. in Electronics and Communication Engineering, MAKAUT, Kolkata, India, May 2017

GPA: 8.65 (out of 10)

Received 160,000 INR (about \$2000) funding as research grant (top 1% in college) | 3rd prize for innovative prototype demonstration in IEM National Entrepreneurship Network E-week (2014)

PUBLICATIONS & PATENTS

1. Ghosh, *et al.*, Gastric Resident Electronics for On-Demand Remote Drug Delivery, *In Preparation*, 2025
2. Ghosh, *et al.* [The continuous actuation of liquid metal with a 3D printed electrowetting device](#), *Med-X*, 2025
3. Ghosh, *et al.* [Diffusiophoresis-enhanced particle deposition for additive manufacturing](#) *MRS Comm.*, 2023
4. Ghosh, *et al.* [ML-enabled feature classification of evaporation-driven multi-scale 3D printing](#) *Flex. Print. Electron.*, 2022
5. Elder, Zou, Ghosh, *et al.* [A 3D-Printed Self-Learning Three-Linked Sphere Robot for Autonomous Confined-Space Navigation](#) *Advanced Intelligent Systems (Featured in Journal Cover)*, 2021
6. Kong and Ghosh, Diffusiophoresis-enhanced particle deposition for AM, **U.S. Patent Application 18/819,977, 2024**

CONFERENCE PRESENTATIONS

1. Diffusiophoresis-enhanced particle deposition for additive manufacturing In **The Minerals, Metals & Materials Society Annual Meeting & Exhibition**, Orlando, 2024 & **MRS Spring Meet**, Seattle, 2024
2. Feature Classification of Evaporation-driven Multi-scale 3D Printing in **The Minerals, Metals & Materials Society Annual Meeting & Exhibition**, San Diego, 2023
3. A 3D Printed Self-Learning Three-Linked Sphere Robot for Autonomous Confined Space Navigation, in **NSF EFRI**, Virtual, 2021