Sharmi Shah

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EDUCATION

Massachusetts Institute of Technology (MIT)   **Cambridge, MA**
Master of Science in Mechanical Engineering (GPA: 5.0/5.0)   **Jun 2025**
Bachelor of Science in Mechanical Engineering with Robotics & Controls (GPA: 5.0/5.0)   **Jun 2023**

SKILLS

Mechanical Design and Manufacturing: CAD (Solidworks, OnShape, Fusion 360), FEA (Solidworks, Abaqus), Machining (Mill, Lathe, Waterjet, Bandsaw, Vertical Saw, Belt Sander), Prototyping (Laser Cutter, Rotary Laser Cutter, 3D Printer)
Electronics and Embedded Systems: PCB Layout (Altium), Embedded Programming (STMCubeX, Arduino, Mbed), Raspberry Pi, Electronics Prototyping (Soldering, Breadboarding, Function Generator, Oscilloscope, Multimeter, Logic Analyzer), Communications (SPI, I2C, CAN, UART, RS-485, Ethernet).
Programming Languages and Simulators: Python, MATLAB, Simulink, C++, LabVIEW, MuJoCo
Creative Software: Adobe Creative Cloud (Premiere Pro, Illustrator, Photoshop, After Effects)

EXPERIENCE

Sencilia (MIT MISTI)   **Groningen, NL**
R&D Intern/R&D Contractor   **Jun 2025-Present**
- Developed machine learning algorithms to improve the accuracy of IV infusion monitoring sensors for applications in neonatal ICUs (patent pending).
- Planned and executed benchtop tests using an environmental chamber to validate sensor stability, precision, and thermal behavior.
- Implemented a neural network in C++ on an ESP32 microcontroller and improved prediction time by 10x.
- Assembled sensor measurement boards with 50+ SMT components using a manual pick-and-place machine.

Biomimetic Robotics Lab   **Cambridge, MA**
Research Assistant - robotic tactile sensing   **Sep 2023-Jun 2025**
- Designed and developed a novel modular 36-taxel barometer-based tactile sensor module achieving ~500 Hz sampling rate in collaboration with Imperial College London.
- Automated high-frequency data collection on a custom 5-DOF gantry with Dynamixel actuators for large-scale data collection, handling actuator integration, calibration, and inverse kinematics.
- Improved contact force, location and high-sensitivity contact detection for tactile sensor via a recurrent neural network estimation model. Implemented performance-optimized model in C++ on an STM32 microcontroller.
- Developed and implemented a 'rolling controller' on an 8-DOF cable-driven manipulator; used improved tactile sensing and proprioception feedback only to execute object rolling and contact detection tasks.

Aurora Flight Sciences   **Cambridge, MA**
Robotics Engineering Intern   **May-Aug 2022, May-Aug 2023**
- Improved path planning algorithms in C++ to prevent unsafe bank angles for autonomous aircraft.
- Developed unit tests for route generation functions within a flight autonomy framework.
- Early-stage design for a multi-aircraft mission autonomy architecture.

MIT Engineering Systems Lab   **Cambridge, MA**
Undergraduate Student Researcher on PEARL – a floating solar powered AUV docking station   **Feb 2021-Feb 2022**
- Performed hydrodynamic simulations to identify the RAO (response amplitude operator), viable geometries, and masses for PEARL.
- Built a data acquisition pipeline for hydrophone sensing using shell scripts; applied signal processing and time-series analysis techniques to accurately monitor river traffic.
- Designed, fabricated, and integrated an autonomous anchor deployment system for PEARL.
- Machined 100+ components using mill, waterjet, vertical saw, and laser cutter to construct another PEARL unit.

AWARDS

- Selected participant for inaugural Touch Sensing & Processing Summer School   2024
- MIT-Imperial College London Global Seed Fund Recipient   2024
- IEEE Aerospace Engineering conference Charles M Fogg Conference Best Paper [MIT News Feature]   2023
- IEEE Aerospace Engineering conference Track Best Paper Award   2023
- NASA Big Idea Challenge Best Technical Paper Award   2022
- NASA Big Idea Challenge Finalist and Awardee [NASA Feature]   2022
- Pi Tau Sigma Mechanical Engineering Society   2021
- 2nd place in the de Florez competition for Innovations in Mechanical Engineering design   2021

PUBLICATIONS

[1] **S.M. Shah**, E. Chun, H. Kim, A. SaLoutos, D. Nguyen, T. Seo, S. Kim. "Constructing Contact Estimation Models for Barometric Tactile Sensors." Under Review ICRA 2026.

[2] GC. Lordos, M.J. Brown, Y. Chen, C. Meza, A. Liao, J.D. Rodriguez, A.S. Miller, **S.M. Shah**, A. Mehrotra, C. Cao, B.M. Bensche, J. Salazar, P. do Vale Pereira, O.L. De Weck and J.A. Hoffman. "WORMS: A Reconfigurable Robotic Mobility System for Extreme Lunar Terrain." *ASCEND 2022*, Las Vegas, Nevada, October 2022.

[3] GC. Lordos, M.J. Brown, K. Latyshev, A. Liao, **S.M. Shah**, C. Meza, B.M. Bensche, C. Cao, Y. Chen, A.S. Miller, A. Mehrotra, J.D. Rodriguez, A. Mokkapati, T. Cantu, K. Sapozhnikov, J. Rutledge, D. Trumper, S. Kim, O.L. De Weck and J.A. Hoffman. "WORMS: Field Reconfigurable Robots for Extreme Lunar Terrain." *IEEE Aerospace Conference 2023*, Big Sky, Montana, Mar 2023.