

Bilal Sabugar

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Gender: Male **Date of birth:** 07/04/2007 **Place of birth:** India **Nationality:** Indian

ABOUT ME

Second-year B.Tech student in AI & Robotics and Co-Founder & CTO of Aetheron Labs LLP. Hands-on experience in robotic systems, embedded electronics, mechanical design, and hardware integration, with research internship experience at IIT Gandhinagar. Interested in robot control, autonomous systems, and applied AI.

EDUCATION AND TRAINING

[01/07/2025 – Current]

B.Tech in Artificial Intelligence & Robotics

Atlas SkillTech University

City: Mumbai | **Country:** India

[01/04/2024 – 01/02/2025]

Higher Secondary Certificate (Class XII – Science)

Divine Life School

City: Ahmedabad | **Country:** India | **Level in EQF:** EQF level 4

[01/02/2022 – 01/02/2023]

Secondary School Certificate (Class X)

Rumi English Medium School

City: Himatnagar | **Country:** India | **Level in EQF:** EQF level 3

STARTUP & INNOVATION

[01/05/2026 – Current]

Co-Founder & CTO | Aetheron Labs LLP

Co-founded Aetheron Labs LLP, a robotics startup developing robotic systems for industrial automation and material handling. Lead technical development across software, embedded electronics, mechanical design, and hardware integration.

- Co-developed S.L.A.B. V1, a working AGV prototype with app-controlled mobility and lifting.
- Guide development of the next version, with planned omnidirectional mobility, robotic gripping, autonomous navigation, and docking.
- Coordinate prototyping, component selection, testing, and integration across mechanical, electronics, and software systems.

Link:

https://aetheronlabs.in

RESEARCH & PROFESSIONAL EXPERIENCE

[01/06/2026 – 31/07/2026]

Robotics Research Intern | IIT Gandhinagar Robotics Lab

- Developed the OSRS Ball Balancer from single-axis vision-based balancing to 2D pitch-roll control with dual load-cell tactile sensing.
- Built Python control pipelines integrating OpenCV, Intel RealSense, HX711 load-cell interfaces, and Dynamixel actuators.
- Implemented PD/PID control, online system identification, adaptive gain scheduling, and mechanical backlash compensation.

Link: https://github.com/TeamOSRS/OSRS

PROJECTS

[05/01/2026 – Current] **VIER | Robotic System for IV Training and Automation**

Developing a robotic platform with a 5-DOF arm and a 1-DOF forearm support for intravenous procedure training on a phantom. Integrating stepper motors, magnetic encoders, and embedded control. Planned capabilities include inverse-kinematics-based motion, closed-loop positioning, and recording trainee movements for performance assessment.

[29/09/2025 – 20/12/2025] **NOVEXA | 18-DOF 3D-Printed Hexapod Robot**

Designed and built a 1-meter-class hexapod robot using Fusion 360 and 3D printing. Developed inverse-kinematics-based Tripod, Ripple, and Wave gaits using Arduino Mega and PCA9685 servo drivers. Integrated MPU6050 IMU and ultrasonic sensing for stabilization and obstacle detection, with separate power supplies for servos and control electronics.

[11/05/2026 – Current] **Raven | Drone-Based Intrusion Detection and Alert System**

Developing a drone swarm comprising one master hexacopter and six modular tricopters for intrusion detection and surveillance. The planned system deploys drones to explore assigned sectors, detect intrusions, issue alerts, and return to the master for docking. Current work focuses on system design, docking mechanisms, mission coordination, and simulation.

[25/02/2026 – Current] **S.L.A.B. | Shelf Loading Autonomous Bot**

Co-developed a material-handling AGV prototype with app-controlled movement and lifting. Contributed to software, embedded electronics, and hardware integration. Currently developing the next version, with planned omnidirectional movement, robotic gripping, autonomous navigation, and docking.

[11/05/2026 – Current] **T.H.O.M.A.S. | Autonomous Maze-Solving Robot**

T.H.O.M.A.S is an autonomous maze-solving robot developed as an AI & Robotics coursework project. It uses Q-learning and MuJoCo simulation to learn navigation through line sensors without access to a map. Trained and tested across different maze layouts, the project is now moving to physical hardware, including mechanical design, electronics, and control system integration.

SKILLS

Programming & Scripting
JavaScript | Embedded C | Python | SQL | NoSQL

Robotics & Embedded Systems
MAVLink | Embedded Systems Fundamentals | Robotics Prototyping | Sensor Integration | Arduino Programming

Computer Vision & AI
OpenCV | Image Processing | Yolov5 | Computer Vision Fundamentals

Tools & Platforms
Firebase | Android Studio | Visual Studio Code | Git | Arduino IDE | GitHub

CAD, Design & Fabrication
Mechanical Design | Assembly Design | Fusion 360 | Parametric Design | CAD Modeling

3D Printing & Fabrication
3D Printing | Rapid Prototyping | Slicer Software | Additive Manufacturing

Simulation
MuJoCO

PUBLICATIONS

[2026] **Fabrication of a 3D Printed Hexapod for All Terrain Adaptive Locomotion**

Reference: B. Sabugar, A. Jadav, A. Veera and R. Henry, "Fabrication of a 3D Printed Hexapod for All Terrain Adaptive Locomotion," International Journal of Innovative Research in Technology (IJIRT), vol. 12, no. 11, pp. 12393–12396, 2026.

Co-authored a research paper on the design and development of NOVEXA, an 18-DOF 3D-printed hexapod robot for terrain-adaptive locomotion. Contributed to mechanical design, fabrication, inverse kinematics, gait generation, embedded control, sensor integration, and experimental validation.

Authors: Bilal Sabugar, Aditya Jadav, Archie Veera, Rabinder Henry | **Journal Name**: International Journal of Innovative Research in Technology (IJIRT) | **Volume, Issue and Pages**: Vol. 12, Issue 11, pp. 12393–12396 | **Publisher**: IJIRT Publications

Link: https://ijirt.org/publishedpaper/IJIRT199344_PAPER.pdf

LANGUAGE SKILLS

Mother tongue(s): Gujarati

Other language(s):

English

LISTENING C1 **READING** C1 **WRITING** B2

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2

Hindi

LISTENING C1 **READING** B2 **WRITING** A2

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

CERTIFICATIONS AND WORKSHOPS

[18/09/2025 – 28/11/2025] **Robotic Arm Control & Kinematics Workshop | IIT Gandhinagar**

Completed practical training in 3-DOF robotic arm control, forward and inverse kinematics, rotation matrices, and embedded programming.

[10/08/2025 – 10/08/2025] **Advanced Drone Technology (Air Taxi) Workshop | I-STEM, IISc Bengaluru**

Participated in practical training covering drone architecture, air taxi systems, propulsion, and flight control fundamentals.

ACADEMIC PROGRAMS & SUMMER SCHOOLS

[20/05/2025 – 30/05/2025] **AI & Robotics Summer School | Atlas SkillTech University**

Completed a practical program covering robotic systems, mechanical design fundamentals, and control principles.

[01/02/2026 – 31/03/2026] **Winter Internship Technical Training Program | India Space Lab**

Completed training in drone technology, CanSat and CubeSat systems, rocketry, remote sensing, GIS, and disaster management.