

SURESH GANESEN

MECHANICAL ENGINEERING

CGPA: 3.85 / 4.00

CONTACT

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PORTFOLIO PORTAL

atomforgestudio.space

LOCATION

Kajang, Selangor, Malaysia

EDUCATION

Diploma in Mechanical Engineering

Politeknik Melaka

2024 - 2027

CGPA: 3.85 / 4.00

COMPETENCIES

CAD & PROTOTYPING

- SolidWorks, Fusion 360, Inventor
- AutoCAD, DXF Technical Drafting
- ASME Y14.5 GD&T & DFM Tolerancing
- FDM/SLS 3D Printing & Slicing

EMBEDDED & FIRMWARE

- ESP32 / ESP32-S3 / Arduino C++
- Sensor Fusion (IMU, ToF, Ultrasonic)
- I2C, SPI, UART, I2S Digital Audio
- Real-time Debouncing & Interrupts

EDGE AI & MACHINE LEARNING

- TensorFlow Lite Edge Inference
- Embedded Computer Vision
- Dataset Curation & Model Training

SYSTEMS & WORKSHOP

- Lathe Machining, CNC Milling
- TIG / MIG Arc Welding, Sheet Metal
- Pneumatic & Hydraulic (FluidSIM)

LANGUAGES

Bahasa Melayu: Professional

English: Professional

Tamil: Native

HONORS & AWARDS

Anugerah Ketua Jabatan

Head of Dept Award (Academic Excellence, 3.85 CGPA)

3D Printing Battle (Bronze)

State-Level Competition (Advanced CAD & Prototyping)

PROFILE SUMMARY

MECHANICAL ENGINEERING & IOT

Mechanical Engineering diploma student (CGPA 3.85 / 4.00, Politeknik Melaka) and Founder of Atom Forge Studio, specializing in 3D parametric CAD, embedded systems, and rapid mechatronic prototyping. Proven expertise building end-to-end physical hardware and IoT platforms spanning sensor-fusion assistive robotics, student wearable safety ecosystems, and precision mechanical fabrication. Recognized with a state-level 3D printing award and departmental academic honors.

FLAGSHIP PROJECT — FINAL YEAR PROJECT

2026 // ASSISTIVE ROBOTICS

Cane AI — Smart Assistive Walking Cane | Lead Hardware & AI Architect

Politeknik Melaka

- Architected an assistive smart mobility device using embedded computer vision and multi-sensor obstacle detection for real-time spatial awareness.
- Engineered around the XIAO ESP32-S3 Sense microcontroller paired with VL53L0X Time-of-Flight and JSN-SR04T ultrasonic transducers for layered proximity telemetry up to 3.0m.
- Deployed an on-device TensorFlow Lite (MobileNetV2, int8-quantized) edge inference pipeline to detect obstacles, tactile paving, signals, and hazards.
- Integrated multi-frequency audio alerts via DFPlayer Mini and dual-intensity ERM coin vibration motors; custom 18650 Li-ion power rail with MT3608 boost conversion.

KEY HARDWARE & ENGINEERING PROJECTS

R&D PORTFOLIO

ATOM-001: Smart Student Safety Badge & NFC Ecosystem | IoT & Wearables

2026

- Architected a full-stack ESP32-S3 student wearable with Firebase Cloud Firestore sync for instant fall detection (>2.8G) and cashless canteen payments.
- Engineered **AI Shield Sentinel** acoustic processing via INMP441 I2S microphone for verbal aggression detection with automated warning buzzer triggers.
- Modeled SolidWorks snap-fit casing engineered with strict 0.15mm DFM clearance tolerancing and IP54 dust protection.

F1-005: Aerodynamic Prototype Vehicle | Mechanical & CFD Design

2025

- Designed and fabricated a kinetic-powered race vehicle prototype with CFD-optimized front inverted wing and underbody Venturi diffuser to minimize aerodynamic separation.
- Integrated custom bronze sleeve bearing wheel mounts, achieving a verified 38% reduction in rotational drag compared to standard rolling hubs.

WIND-006: Sustainable Micro Wind Turbine Harvester | Renewable Energy

2024

- Engineered 3 cambered aerofoil rotor blades optimized for an ultra-low cut-in speed of 2.2 m/s and high Betz limit kinetic energy extraction.
- Coupled coreless DC generator with a Schottky full-bridge rectifier circuit to deliver 5.0V DC regulated USB power.

PROFESSIONAL CREDENTIALS & SAFETY

CERTIFIED

- CIDB Green Card (SICW)**: Active Registered Safety Personnel authorized for industrial and construction operations.
- Certified SolidWorks Mechanical Design**: 3D parametric part modeling, multi-body assemblies, and ASME Y14.5 GD&T drafting.
- Embedded Systems Certification**: Mechatronics Hub certified proficiency in microcontroller telemetry and hardware architecture.

ACADEMIC REFEREE

Mr. Muhamad Faiz Bin Jofri

Academic Advisor, Politeknik Melaka

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