

MANIDEEP REDDY TAMMA - R&D Robotics Engineer

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Edinburgh, Scotland, UK

PERSONAL STATEMENT

An industrial research engineer specialising in medical robotics, with over four years of hands-on innovation across firmware safety architecture, wireless protocol design for regulated medical devices, soft pneumatic actuation and pressure waveform-based sensing. As Bioliberty's first full-time engineer, has shaped design decisions on safety critical firmware, BLE communication for medical devices and production engineering that has scaled the flagship product from prototype to 100+ commercially deployed units. Named co-inventor on an international PCT patent and contributor to FDA-registered products recognised at the 2026 MedTech Breakthrough Awards. Driven by engineering innovation that improves the lives of people recovering from stroke and neurological conditions.

KEY ACHIEVEMENTS

- Co-inventor on international PCT patent WO2025190946A1, "Soft Robotic Assistive Device," contributing novel engineering concepts including pressure-waveform-based motion sensing, undesired-movement detection for spasticity safety and adaptive parallel/series gas pump configurations, the technical foundations of Bioliberty's FDA-registered Lifeglov and Lifehub products. (WIPO, 2025)
- Awarded Best Group Project by Cranfield University and Ocado Technology for the Robot Receptionist, delivered during the MSc Robotics programme. (Cranfield University & Ocado, 2022)
- Awarded Top Performer and prize money of Approx. 1000 GBP, by IIT Madras for the best project built from e-waste under sustainable engineering. (IIT Madras, 2018)
- Awarded Best Engineered Project and prize money for Approx. 300 GBP by CVR College of Engineering for the CNC Pen Plotter. (CVR College of Engineering, 2018)

EDUCATION

MSc Robotics (Distinction): Cranfield University, Cranfield, UK **Oct 2021 – Sep 2022**

IMechE-accredited programme meeting the academic requirement for Chartered Engineer (CEng) registration.

- Modules: Fundamentals of Robotics, Robotics Control, AI and Machine Learning for Robotics, Programming Methods for Robotics, Human-Robot Interaction, Machine Vision for Robotics, Psychology Ethics and Standards.
- **Individual Thesis:** "Real-Time 3D Environment for Low-Latency Collaborative Tele-Robotics Applications" -- industry collaboration with the Manufacturing Technology Centre (MTC). Designed a real-time 3D rendering architecture for sub-100ms-latency tele-robotic control using Point Cloud Library, OpenGL, Qt5 and TCP/IP networking under C++ STL 11/17.
- **Group Project (Best Project award):** Co-architected a Pal Tiago-based hotel receptionist robot for DoubleTree by Hilton MK and MK 5G, integrating SLAM-based autonomous navigation, computer vision and natural language processing on ROS.

BTech Mechanical Engineering: JNTU Hyderabad (CVR College of Engineering), India **Sep 2014 – May 2018**

- Modules: Engineering Mechanics, Thermodynamics, Heat Transfer, Fluid Mechanics, Materials Science, Manufacturing Technology, Computer-Aided Design, Mechanical Vibrations, Design of Machine Elements.
- **Final Year Project:** Smart Surveillance Mobile Robot using IoT -- designed a multi-terrain robot architecture integrating Raspberry Pi 3B and Arduino for embedded control, camera-based vision and IoT-based remote command, combining mechanical chassis fabrication with embedded software development.
- **Second Year Project (Best Project in college, Jan 2018):** CNC Pen Plotter -- designed the mechanical system and developed firmware to convert digital drawings into physical hard copies.

CAREER HISTORY

Bioliberty Ltd: Edinburgh, UK -- Robotics Engineer (R&D) **Apr 2023 – Present**

An Edinburgh-based medical soft-robotics company (approx. 35 employees) building AI-enabled wearable rehabilitation devices for stroke recovery. Raised approx. £11.9M including a £7.7M Series A. Products that are FDA-registered and deployed across major US rehabilitation networks.

- Led Projects Naur and Pare, the internal R&D programmes from which the invention in PCT patent WO2025190946A1 emerged, becoming one of seven named co-inventors. Contributed engineering concepts including pressure waveform-based motion sensing (replacing discrete sensors), undesired movement detection for spasticity safety and adaptive pneumatic pump configurations - now the technical core of the company's flagship products.

- Designed and built the firmware safety architecture (Project Pascal) for Lifehub's entire pneumatic system, defining the test sequencing logic, failure thresholds, diagnostic outputs and safe-state recovery now used to validate and service every Lifehub unit before and after clinical deployment.
- Led the engineering design and development of the Lifehub production system, building the software and database from scratch (with collaborative hardware integration) for firmware deployment, device tracking, automated in-line testing and clinical-grade traceability, scaling the product from prototype to over 100 commercial units in active US clinical use.
- Made the technical design decisions for the Bluetooth Low Energy stack, balancing medical grade reliability, power optimisation and data integrity and completed Bluetooth development certification to lead the work. The stack now runs in every deployed Lifehub unit.
- Currently engineering the firmware architecture for the next generation of Lifeglov, building on the FDA registered product line.
- Served as mechatronics engineer on the £435,000 Innovate UK Biomedical Catalyst grant (Dec 2023, ref. 10071274), engineering the machine learning and data collection architecture for the soft robotic glove.

Space Resources Laboratory Ltd: Cranfield, UK -- R&D Engineer

Sep 2022 – Mar 2023

A CubeSat subsystem provider (structures, power, attitude control, payloads, propulsion).

- Designed and fabricated a proof-of-concept magnetorquer module (Project Ampère) for 3U CubeSat attitude control, combining additive manufacturing with fabrication and validating magnetic moment performance against design targets via FEMM electromagnetic analysis.
- Researched and designed control architecture for a 3U CubeSat platform, successfully delivering of grant-funded R&D milestones.

Volador FlyTech: Milton Keynes, UK -- Control System Engineer (R&D)

Apr 2022 – Nov 2022

An ultra-light Electric Vertical Take-Off and Landing (EVTOL) aircraft startup developing autonomous urban mobility.

- Designed control and autonomous navigation safety subsystems for an ultra-light EVTOL aircraft, integrating vision-based sensors with OpenCV, ROS and Pixhawk Cube Orange flight controllers to enable autonomous flight behaviours.
- Designed and built two generations of brushless DC motor test rigs (ATmega328P, then Raspberry Pi Pico/4B), enabling systematic propulsion-efficiency measurement and failure point characterisation.
- Developed scaled drone prototypes using DJI Naza V3 and Pixhawk Cube Orange controllers, and integrated DJI Tello platforms for computer-vision testing.

Self-Employed (Upwork): Hyderabad, India -- Mechanical Design Engineer (Freelance)

Apr 2020 – Mar 2022

Freelance consultancy delivering mechanical design, additive manufacturing and robotics solutions for clinical, industrial and consumer clients.

- Designed and manufactured a single hand operated syringe holder for TechnoSmiles dental practice, identifying a clinical need and delivering a working medical device from concept to clinician deployment.
- Engineered the mechanical housing and integration software (ROS, C++, Python) for a portable LiDAR scanning unit, enabling mobile 3D mapping for client deployment.
- Developed firmware (ATmega328P, C++) and a Bluetooth communication stack for Carbonado Backpacks' connected motorcycle backpack.

Futuristic Labs: Hyderabad, India -- Mechanical R&D Engineer

Jul 2021 – Sep 2021

A smart kitchen appliance startup developing connected induction cooking technology (now CookWithSemi).

- Researched thermal sensor placement for an induction cooking vessel, conducted thermal simulations in Fusion 360 to benchmark performance, and integrated firmware on STM32 microcontrollers.

Nuclear Fuel Complex (Dept. of Atomic Energy): Hyderabad, India -- Junior Design Engineer (Intern)

May 2018 – Jun 2018
Government of India nuclear fuel manufacturing facility under the Department of Atomic Energy.

- Redesigned the cooling mechanism for billet manufacturing during fuel-rod-shell production, improving process efficiency by approximately 20% and saving an estimated 30 man hours per month while increasing production quality.

PATENTS & PUBLICATIONS

- **Patent (PCT):** Quinn S., Bradley C., O'Hanlon R., Armstrong R., Carter H.C., **Tamma M.R.**, Maclean M.J. (2025). "Soft Robotic Assistive Device." WIPO Publication WO2025190946A1. Filed 11 Mar 2025; published 18 Sep 2025. Priority GB2403589.1 (12 Mar 2024). Assignee: Bioliberty Ltd.

RECOGNITION & INSTITUTIONAL ENDORSEMENTS

- Featured alumni profile on Cranfield University's official Aerospace Blog (Mar 2024), written by Cranfield staff and used in active recruitment for the MSc Robotics programme.
- Listed on Space Resources Laboratory's official team page 'The Crew Who Make It Happen' and named in the company's 4th-anniversary LinkedIn post.
- Tour de 100-endurance cycling, finished 140th worldwide (HDOR, 2021).

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Firmware & Embedded:** STM32, Nordic 52832 (BLE), ARM Cortex M4, ATmega328P; Embedded C/C++ (11, 17, 20), Python 3; Robot Operating System (ROS); Linux and real-time systems.
- **Libraries & Tools:** OpenCV, SLAM, Point Cloud Library, Git/GitHub, CMake, Boost, Eigen3, Qt5, LabVIEW, FEMM electromagnetic analysis.
- **Mechanical & Hardware:** SolidWorks 2023, Fusion 360, CATIA, AutoCAD; additive manufacturing, CNC, Altium PCB design.
- **Certifications:** Aerial Robotics (University of Pennsylvania), Nordic nRF Connect SDK, Bluetooth Low Energy Fundamentals, C++ Templates and STL, Git and GitHub.
- **Languages:** English (fluent), Telugu (native), Hindi (fluent).
- **Memberships & Volunteering:** Member, Water of Leith Conservation Trust (Edinburgh), UKSEDS Olympus Rover competition (Cranfield, 2022), completed a half marathon for Chest Heart and Stroke Scotland, raising over £375 (plus Gift Aid) against a £300 target (2026).
- **Interests:** Bio-inspired robotics, medical robotics for accessibility, additive-manufacturing prototyping, endurance cycling (Audax 200–300km events) and digital art (arttme.com).