# Aniketh Ramesh

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## RELEVANT EXPERIENCE

**Stellar Advanced Concepts** **Jul. 2024 – Present**
*Lead Robotics Engineer* *London, United Kingdom*

Stellar AC is an **engineering consultancy** focused on designing and prototyping shape adaptive technology, compliant systems, nature inspired robots with the complementary AIs, sensor integration and control algorithms.

- **Project manager** of the Morphing Wing **Drone project**, I **oversee the design and prototyping** of the flight demonstrator
  - **Leading a team** of PhD Students, Interns and Researchers
  - **Setting timelines** for the project,
  - **Draft Market research reports** and comparative metrics trade-off analysis reports to identify niches and cost-benefit trade-offs to streamline drone design.
  - **Source components** to design drones, set-up lab equipment.
  - **Set up lab operating procedures**, drafting rules for safe use and disposal of batteries, solder stations, 3D printers and flow test chambers
- **Designing a flight controller** for the world's first fully retractable morphing wing drone.
  - Calibrating and **programming** the servos for span control, wing morphing and roll control.
  - **Designing** the ailerons and the V-Tail to ensure the **drone** can execute different **manoeuvres** optimized for take-off, cruising and landing.
  - **Mapping the wing** and **V-Tail control** to the RC, and range-**testing TX and RX** comm system.
  - **Conducting flight trials** to determine the drone's specifications under different weather conditions
  - **Interfacing** off-the-shelf IMU, Servo Encoders and Camera **with a Raspberry Pi**.
  - **Developing** an **Inertial navigation System** and a **model predictive control system** for the drone.
  - Using a Raspberry Pi with C++, Python for data analysis.

**Extreme Robotics Laboratory, University of Birmingham** **Aug. 2024 – Present**
*Doctoral Researcher* *Birmingham, United Kingdom*

Robotics **PhD** with a **specialisation** in **Multi-Robot Mission control** for Hybrid UGV-UAV teams. Developed a diverse, **interdisciplinary skillset** including ML, Navigation Control, Interaction Design and Human Factors engineering. Demonstrated a **keen ability to facilitate research projects** from conception to prototyping, leading industry demos and user studies. Created a **track record** of working in highly interdisciplinary, collaborative teams with independent initiative and continual learning.

- Skilled in the **research and development** of semi-autonomous systems, and human robot interaction.
  - Developed, maintained and optimised **variable autonomy control algorithms** for UGVs and UAVs.
  - Created the '**Robot Vitals and Robot Health Framework'**, a **1st-of-its-kind** framework to assess robot performance in real time using robot operation data.
  - Developed **mission control interfaces** and control architectures for single and **multi-robot missions** in challenging environments.
  - **Designed and conducted experiments** with **85 participants** to investigate several qualitative and quantitative parameters of human-robot interaction, particularly for remote robot missions. Analysed results using ANOVA, Paired T Test and the Wilcoxon test in Python using Pandas.
  - Gained **extensive experience in designing user interfaces** in Unity and RViz to explore the relation between operator cognitive workload, trust, and transparency, scalability with robot mission performance.
  - **Analysed** over 500GB of robot operation **time series data** to evaluate and improve robot guidance control strategies for **human robot teaming** like shared control, adaptive automation and mixed initiative systems.
- Leading **Client Demos and Public Outreach** for the Lab. Links: [1], [2]

- Successfully **led 14 client demos** to Manufacturing centres and Government Agencies and pitched how **my research can be used for remote asset monitoring**, autonomous robot triaging and multi-robot management. **50% of my demos** have contributed to **successful** collaborations and funded grants.
- Disseminated research findings in **6 published papers** in **prestigious robotics conferences (SMC,IROS,HRI,RAL)** in total and presented them to diverse audiences of 10-100 people at **conferences and invited talks**.
- **Led cross-disciplinary team** for UK Robotics Festival, overcoming scheduling challenges and tight deadlines. Organised, planned and executed the livestream and Q&A for the robotics showcase by my lab
- **Facilitated brainstorming sessions** to rally the team, develop storyboards, integrate different technologies and set up mock-up scenarios for demos.
- Gained **experience in team management**, conflict resolution.

**Turing Data Study Group** **September 2021**
*Facilitator* *Birmingham, United Kingdom*

- **Led an interdisciplinary research group** to **develop a machine learning model to automate** dark field microscopy (DFM) based vascular perfusion index calculation. [Link to report]
  - Used a **Kanban to split work** between subgroups, and **track progress** in a simple and transparent manner.
  - Gained **significant experience** in team **management**, research study development and **conflict resolution**.
- Used **OpenCV and PyTorch** for developing a dark field microscopy scan quality assessment tool. Condensed each **3 second video into a single image representing** the **optical flow** and used a 3-layer **convolutional neural network** to build a perfusion index classifier.
- **Collated and Compiled research findings**, experimental results, methodology from the team members into a final **report**, along with recommendations on using **GANs to augment training data**.

## EDUCATION

**Extreme Robotics Laboratory, University of Birmingham** **April 2020 - Present**
*PhD in Robotics* *Birmingham, United Kingdom*

- Total Citations: 49
- H-Index : 4
- I10 Index: 2

**University of Bristol** **Sept 2018 – Sept 2019**
*M.Sc. Robotics* *Bristol, United Kingdom*
Graduated With **Merit**

**Amrita School of Engineering** **July 2012 – July 2016**
*B.Tech Electrical and Electronic Engineering* *Bangalore, India*
Graduated With **Distinction**

## TRAINING, SKILLS & INTERESTS

- **Training:** Cambridge Ellis Machine Learning Summer School (July 2022), Multi-Robot Systems Summer School, CTU Prague (2022)
- **Technical Skills:** C++, Python, ROS1/2, MAVROS, DDS, PX4, Ardupilot, Unity, SLAM
- **Soft Skills:** Technical Liaison**,** Research and Development, Leadership, Facilitation, Technical Communication
- **Interests:** Live looping music, learning new instruments, collecting records, reddit, philosophy.