# **KARTIKEYA BECTOR**

📞 (332) 250-3066 🖾 bectorkartikeya@gmail.com 🛅 linkedin.com/in/kartikeya-b/ 🔗 kartikeyabector.com

#### SKILLS

<b>Design:</b> Fusion360, SolidWorks
Microcontrollers: Arduino, RaspberryPi
Software: Simulink, Jira, Confluence, Git, AWS
Coding: MATLAB, Python, Bash, C++

Prototyping: 3D Printing, Laser Cutting Hardware: Linear Actuators, Servo motors, Stepper motors, I2C/SPI sensors **OS:** Windows, Linux, Unix Communication Protocols: Serial, RS232, I2C, SPI, Ethernet

### **EXPERIENCE**

### **Quadrus Medical Technologies**

**R&D** Engineer

White Plains. NY Feb 2023 - Present

Skills: Fusion360, 3D printing, MATLAB, Python, C++, Bash, Linux, Git, Simulink, Arduino, RaspberryPi, 12C, Controls, System ID

## CoVent20: Emergency Smart Ventilator

- Led system-level integration of hardware and software sub-systems embedded firmware and algorithms of flagship ventilator
- Integrated I2C/SPI-based sensors and actuators with embedded microcontrollers for real-time prototype
- Automated integration/testing, reducing iteration time by 90%, to meet strict deadlines for Series A demo
- Worked with CTO for system identification (physiology, sensor delays, actuator dynamics), improving simulation-to-hardware accuracy
- Worked with co-founders to develop real-time parameter estimation (RTPE) & spontaneous breathing algorithms using sensor data and advanced optimization techniques - conference paper on RTPE algorithm accepted for presentation
- Assisted senior leadership to draft NIH SBIR Grant proposal worth \$500K+ for groundbreaking ventilator work

#### DRWave: Medical Device Data Acquisition (DAQ) System for the ICU

- Translated customer needs and ISO standards into system requirements; collaborated with software development team to develop automated test protocols for PFMEA and OC of \$100K+ worth of DRWave boxes
- Built data processing, analysis and deidentification pipeline for HIPAA compliant data totaling ~10TB on AWS
- Coordinated with internal software and global hardware vendors to define clear project milestones, track progress, and timely develop and deliver Real-Time Clock Dongle
- Led product design, prototyping, and integration of RTC into DRWave software
- Established KPIs to measure reliability improvements, achieving a 300% increase in RTC reliability
- Conducted root cause analysis (RCA), CAPA improving system reliability from 50% to 95%

#### Single Compartment Test Lung: Lung Emulator for Off-the-Shelf Medical Balloons

- Spearheaded mechanical design and build of Test Lung 90% cheaper than market alternative to test non-standard patient cases
- Developed a 5%-error resistance mechanism (servo motor) and compliance mechanism (stepper motor) using Arduino
- Managed **3 summer interns** to conduct open-loop experiments and improve system-integration based on first-principles design

#### Vimaan Robotics, Inc.

Mechatronics Intern (R&D Department) Skills: Jira, Confluence, SolidWorks, Python, C++, Arduino, OpenCV, 3D printing, Laser Cutting

- Collaborated across departments, using SolidWorks (GrabCAD Workbench for version control) for complex assembly, component design, BOM and prototyping (GD&T/DFMA); participated in weekly sprints, managing project milestones using Jira and maintaining project documentation on Confluence
- Collaborated cross-functionally to design electro-mechanical testing rigs for robotic CV applications, with Arduino-controlled systems; performed subsystem bring-up, calibration and tuning
- Improved efficiency of image data collection by 90% using Python-based automation scripts (OpenCV)
- Created Python simulation tool for rapid validation of lighting subsystem designs reduced iteration cycles from 2 days to 2h
- Conceptualized modular in-house lighting solution (50% cheaper) using Python simulation tool, optimizing for thermal and electrical management

#### **EDUCATION**

#### **Columbia University** M.S. Mechanical Engineering (Robotics and Control Track), GPA: 3.64/4.00 Sep 2021 – Dec 2022 Coursework: Mechatronics, IoT, Human-Centered Design, Data Science; Awards: Best IoT Project - City Nav Bike Jacket

#### Delhi Technological University (DTU)

B. Tech (Mechanical Engineering), GPA: 7.7/10.0

Awards: Research Excellence Award for contributing to 6 research papers over 2 years in advanced manufacturing and composites

Santa Clara, CA Jun 2022 - Aug 2022

New York, NY

Delhi, India

Aug 2017 - Jul 2021