

Usama Saqib

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Summary

I am an Embedded Systems Engineer with knowledge and experience in sensor integration. I am currently part of Audio Analysis Lab at Aalborg University, Denmark, where I am a final year PhD student with a research interest in signal processing for robots and drones. Over a span of several years, I possess a unique mix of hardware and software engineering skill sets that are very useful to industry.

Key Skills and Competencies:

- Software Development experience in C, Python, MATLAB
- PCB layout in EagleTool, KiCAD
- Knowledge of microcontroller, FPGA programming
- Experience in PCB testing

Publications

- Sound based Distance Estimation for Indoor Navigation in the Presence of Ego-Noise [Published, EUSIPCO 2019] [\[LINK\]](#)
- An EM Method for Multichannel TOA and DOA Estimation of Acoustic Echoes [Published, WASPAA 2019] [\[LINK\]](#)
- A model-based approach to acoustic reflector localization using robotic platform [Published, IROS 2020] [\[LINK\]](#)
- An Expectation-Maximization method to acoustic echoes localization [Published, EURASIP 2020] [\[LINK\]](#)
- Detecting Acoustic Reflectors using a Robot's Ego-Noise [Submitted, ICASSP 2021]
- Acoustic Spatial Mapping for Mobile Robots [Submitted, ICASSP 2021]
- A Framework for Acoustic Reflector Localization and Mapping [In Process, IEEE Transaction on Robotics 2020]

Employment History:

May 2018 – Present – PhD Fellow

Aalborg University, Denmark

Supervision and Teaching Responsibility:

- Supervising and Mentoring undergraduate students on their final year design project
- Teacher assistant on Physical Interface Design course
 - Helping students with assignments, course content and course project

Research Topic: Sound processing for Robots and Drones

- Design and programming of robotic system using ARM Cortex microcontroller
- Programming experience in Digital Signal Processors using 32 bit microcontrollers

- Using MATLAB and advance signal processing to create simulations and models of sound
- Implementing Beamforming techniques
- Python for data representation and visualization

Nov 2017 – Mar 2018 – Embedded Systems Engineering

Geointeractive Pyt Ltd, Sydney, Australia

Designing an innovative robotic system to monitor and map sewers using computer vision application

- Programming sensor networks for robotic platform to capture data using STM32 microcontroller
- Hardware design prototyping as well as PCB layout for effective hardware performance
- Embedded Linux programming to capture, analyze and compute incoming data
- Embedded computer vision interfacing with mobile robot

Feb 2017 – June 2017 – Hardware Engineering Consultant

Kodama World, London, U.K.

A video gaming system startup

- Provided consultancy on hardware development using digital and analog circuitry
- PCB development using EagleTools
- Sourcing low power components to design a power efficient module and to reduce the size of production board

Jul 2015 – Dec 2016 – System Test Engineer:

Vinaya Technologies Ltd, London, U.K.

An IoT start-up specialising in wearable technology. Launched two products **Altrius1** and **Altrius X**.

- Python GUI development of testing tools i.e. script routines, data analysis, LiPo battery capacity simulation
- Responsible for executing RF consumer product R&D i.e. antenna efficiency testing
- Modifying Embedded hardware to test RF and data analysis on Bluetooth range and signal strength using Python library SciPy and Panda
- Hardware assembly of components i.e. SOP packages, PCB layout using **Altium**
- Consult with manufacturers to ensure problem free production and optimal design.
- Prepare all the technical documentation, drawings and BOMs for printed circuit assemblies required for product manufacture

Oct 2014 – Jul 2015 – Hardware Engineering Intern:

Vinaya Technologies Ltd, London, U.K.

As a hardware engineering intern, I was responsible for documenting, testing and researching components, production test beds and Antenna design & evaluation. Moreover, I was also responsible for

- Executing test cases, documenting results and defects.
- RF testing and data analysis on Bluetooth range and signal strength using **Python** library
- Hardware assembly i.e., soldering PCBs, test beds and troubleshooting production hardware.

Jan 2013 – Oct 2013 – Logistic & Store Coordinator:

Emirates Airline, Dubai, U.A.E.

- Receiving, inspection, binning, issuing and delivery of aircraft materials using SAP software,
- tooling and equipment for main base and line maintenance operations,
- dispatch of aircraft materials, tooling and equipment as per shipping request,
- supporting the main store in planning and sourcing of spares, tools and materials

Education & Qualification:

2018 – 2021 – Sound Processing for Robots& Drones, Aalborg University, Denmark.

Designing a sound processing algorithm for indoor map generation for mobile robots

- Using MATLAB and advance signal processing to create simulations and Models
- Python for data representation and visualization
- Design of robotic systems using Robot Operating System (ROS)
- Programming experience in Digital Signal Processors using 32 bit microcontrollers

2013 – 2015 - Embedded Systems Engineering (MSc, 2:1), University of Bedfordshire, U.K.

MSc Project:

- A Mobile Robot with vision based obstacles detection and avoidance [[LINK](#)]
- ZigBee and 6LowPAN [[LINK](#)]

2007 – 2011 - Electrical Engineering (BSc), American University of Sharjah, U.A.E.

BSc Project:

- An Adaptive noise cancellation filters using DSP technique implemented on FPGA.
- Avionic Sensor Module [[LINK](#)]

Languages:

- **English:**
 - Excellent - Speaking, reading and writing fluently
- **Danish:**
 - Beginner - Taking Danish language classes
- **Urdu:**
 - Native Speaking, reading and writing fluently

Volunteer Experience:

- **Hemani Group, Dubai, U.A.E** – feasibility report for charity hospital in Dubai.
- **UNICEF, Sydney, Australia** – Working as a fundraiser and promoter
- **Red Cross, Dubai, U.A.E.** – Working as a fundraiser and promoter
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Referees:

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