Sheikh Usman Ali

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Education

Technical University of Munich — Munich, Germany
Master of Science - Communications Engineering (Nachrichtentechnik) — *Oct 2020 - Present*

Jacobs University Bremen — Bremen, Germany
Bachelor of Science - Electrical and Computer Engineering (Minor Intelligent Mobile Systems); CGPA 1.87 — *Aug 2017 - Jun 2020*

University of Aberdeen — Aberdeen, Scotland UK
Semester Abroad Erasmus - Computing Science — *Sep 2020 - Feb 2020*

Experience

Fraunhofer Institute for Integrated Circuits IIS — Nürnberg, Germany
Research Assistant · Positioning and Networks — *2019 - Present*

- **Smart Sensing and Analytics** `Python MATLAB SketchUp Oktal-SE SE-NAV` : MSc. Internship, built a Scikit-Learn & TensorFlow based Machine-Learning pipeline for classification of LOS/NLOS 5G & GNSS signal to further enhance positioning algorithm accuracy. Created Jupyter notebooks for ML-pipeline and documented data preprocessing. Performed ANOVA testing and PCA for feature selection. Migrated code for Kalman filter from MATLAB into python and ran unit-tests to verify and debug code execution.
- **Sensor Fusion and Localization** `Matlab C++ SketchUp` : Designed a new Positioning Referece Signal for 5G (3GPP Release 16) and compared the positioning accuracy of state of the art with LTE-based OTDOA multilateration. Implemented a MATLAB simulation using a statistical Channel model& Ray-tracing model of Indoor Office environment.Added PRS module to the company codebase using CI/CD pipeline. Built a GUI to visualize real-time TDOA simulation with mobile base stations.
- **Smart Sensing and Analytics** `Python MATLAB SketchUp Blender Spirent SimGEN Oktal-SE SE-NAV` : Assisted a team in developing a testbed for 5G - New Radio signalling. Preprocessed Bayern state survey data to generate a 3D model of the city for channel modelling. Executed moving & coverage simulations for 5G & GNSS networks. Performed remote-controlled tests using Sim-Gen via python scripts over TCP/IP for GNSS & 5G hybrid positioning.

Jacobs University Bremen — Bremen, Germany
Student Assistant · Cognitive Science Lab - Prof. Dr. Adele Diedrich — *Apr 2019 - May 2019*

- **Monte-Carlo Simulations** `MATLAB` : Developed and debugged a series of Monte-Carlo simulations in MATLAB for psychology experiments: Multiattribute attention switching (MAAS) model and Multi-stage sequential sampling models with finite or infinite horizon and variable boundaries. Implemented tests to verify the correct logic of developed simulations.

Projects

IoT Remote Lab `JavaScript nodejs JSON MySQL` : Created a smart weather monitor for automated gardening sprinklers using web of things standard from W3C. Incorporated APIs to fetch hourly weather forecast, store it in a 48 hour database and based on self-built weather model predict the rain to attain optimal plant growth.

Enterpreneurship `Python OpenCV C++` : Lead role head of technology in a diverse team. Engineered Anti-poaching startup to combat illegal Rhino poaching in South Africa. Designed innovative solutions using drones, ML, and CV to assist rangers. Collaborated with drone manufactorers and and space agency to devise a surveillance plan for tracking poaching incidents.

Embedded Systems Lab `C++ Embedded C` : Designed a light-Seeker Robot. Built a sensor using photo-resistors to determine direction of incoming light. Constructed a H-bridge that turns a Servo DC motor towards the light source. Researched a method to ramp the motor's acceleration to create a critically damped system.

Advanced Digital Design `VHDL C` : Created a VHDL based Universal Asynchronous Receiver/Transmitter (UART) using XILINX Synthesis tool on Spartan-3 Starter Kit Board. Built a driver for 7 Segmend LED to display hexadecimal codes.

Technical Skills

Languages: Matlab , Python , C++ , C , JavaScript , VHDL , SQL

Technologies: NodeJs , Linux , Embedded C , Web of Things