Aditya Saggar

Linkedin: https://www.linkedin.com/in/adityasaggar/
Github: https://github.com/average1129
Portfolio: https://average1129.github.io/portfolio/

Email : adityasaggar2911@gmail.com
Mobile No. : +49 15560817968

Research Interests

Satellite Communications and Networks

Global Navigation Satellite Systems

Software Defined Radio and Networks

Distributed Space Systems

Skills Summary

- **Languages**: C++, Python, C, Java, Unix scripting
- **Tools**: MATLAB, GNURadio, GIT, OMNET++
- **Areas**: Software Defined Radio, Wireless Communications, Networking,5G Systems[O-RAN], Timing & Synchronization[ITU-T G-8275.1], Precision Timing Protocol[IEEE 1588]

Experience

- **Newspace Research & Technologies** — Bengaluru, Karnataka
  Communications Engineer II — *Jan 2023 - Aug 2024*
  - **Swarm - Multi Network Integration**: Designed network architecture to enable heterogenous UAV swarming via INMARSAT and 4G networks concurrently, providing Command Control and content delivery remotely.
  - Networking for Cloud deployment of inter-networked flight control software.
  - **Communication Mesh Monitor: Monitoring & Automation for Cognition**: Designed and developed Communication Mesh Monitor(CMM), a cross layer cognitive network & radio platform for heterogenous swarms [Python and Java].
  - **Adaptive Video Streaming**: Developed and tested 2 separate approaches: 1) SNR-MCS based, 2) Error rate based based on available literature.
  - **Swarm EW Strategies Study**: Conducted study and tests on swarm based approaches for operations in Comm and GNSS denied environments.
  - **Radio Logging & Monitoring Software**: Developed network and radio logging software for multiple MANET modems, along with scripts for post mission analysis.
  - **Communications Operator**: Mission planning, operation and execution for communications for missions and demonstrations to special dignitaries, Indian Air Force, Indian Army, Directorate General of Quality Assurance, UAE Govt. Delegation, etc.
  - Test flights of multiple class of aircraft including: fixed wing, multi rotor, high altitude pseudo satellite and glider
  - Trained Indian Army Units across India
  - **Network Simulations & Testing**: Basic 3D and 2D simulations for comm. behaviour of swarm using OMNET++

- **Sardar Vallabhbhai National Institute of Technology** — Surat, Gujarat
  Research Intern - Advanced Communication Research Lab - Prof. Shweta Shah — *October 2022 - Jan 2023*
  - **SDR based GPS jammer and spoofer** : Characterization of GPS jamming and spoofing using gps-sdr-sim and PlutoSDR and BladeRF. Created basic MATLAB simulations
  - **SDR based Indian Region Navigational Satellite System Spoofer**: Developed IRNSS spoofer submodules for timing, ephemeris reading, PRN code generation, Subframe generation, and interleaving in C++, based on gps-sdr-sim and GPS & IRNSS SPS ICDs.

- **Larsen & Toubro Technology Services** — Mysore, Karnataka
  Communications Engineer — *Aug 2021 - Jan 2023*
  - **NEC O-RAN 5G Lab**: Lab setup and designed 5G & 4G testcases for Mavenir-NEC .
  - **5G :Synchronization as a Service**: Independently developed and pitched Top 20 submission in TechExpression (Org-wide Technical Competition)
  - **LTTS Next-Gen Networking Lab:**: Single Physical Point of Contact for Mysore 5G lab

- Bring up of 5G O-RAN timing networks: O-RAN timing configs : LLS -C1,C3,C4
- Extensive study of ITU-T G-8275.1, IEEE 1588 standards, and O-RAN WG4 working document
- Bringup of Servers for O-RAN and lab, OpenAirInterface eNodeB & UE, Bentel 550 Indoor RU, Fibrolan GM, net admin, cabling, etc.
- DPDK and FAPI Development, System Integration and bringup for O-DU Low-High with Radisys & Intel teams.

Advanced Level Telecom Training Centre, BSNL Remote
Telecommunication trainee *June 2020 -July 2020*
- **ITU certified Training Programme in Advanced Telecommunications**: Participated in 4 week long professional course covering fibre optic communications for backbone networks, and 2G,3G,4G: radio access, and core network design.

13 Base Repair Depot, Indian Air Force Palam, New Delhi
Engineering Intern *June 2019– July 2019*
- **Calibration Report Generator**: Developed application for digitization of Calibration Reports of communications & test equipment using PHP and MySQL
- **Communications Equipment Repair**: Conducted basic repair and common fault analysis of all IAF communication equipment- exposed to satellite, radar, optical and wireless technologies.

Millimetre Wave Research Group, Defence Electronics Application Laboratory Dehradun,Uttarakhand
Research Intern,Defence Research & Development Organization *Dec. 2018 – Jan 2019*
- **Design of Variable Frequency Generator using 8051 Micrntroller**: Implementation of different algorithms for variable frequency generation for 8051 microcontroller on uKeil simulator.
- Conducted comparitive frequency stability analysis for frequencies generated using different techniques.

ACADEMIC PROJECTS

Hybrid Crypto System[4096 bit RSA & 128 bit AES Encryption] L&TTS
C,gmplib,,tinyAES,sockets lib *Jun 2021*
- Designed system to generate 2048 bit prime number in multithreaded fasion
- File contents encrypted usig AES-128, and then AES-128 keys are exchanged using 4096 bit RSA keys, for secure and efficient key transfer.

Automatic Modulation Classification using Deep Learning SVNIT
Python,Keras,TensorFlow *Oct 2022 - Jun 2021*
- **BTech Final Year Project under Dr Kamal Captain**: Developed and tested wide variety of neural networks : CNNs, LSTM, CNN-LSTM, Attention Modules, Encoders, Dual Stream CNN for Automatic Modulation Classification of Unidentified Radio Signal based on RML2016b database by DeepSig, and work done by Tim O'Shea*[Convolutional Radio Modulation Recognition Networks, 2016]*
- Developed novel Dual Stream CNN-LSTM utilizing both amplitude and phase inputs for effective identification
- Able to corroborate results with cutting edge work in the field.

Instrument Landing System Localiser Receiver using SDR Airport Authority of India
GNURadio,C++,FFTW lib, Python *Sep 2021 - Feb 2022*
- **Reciever design for Localizer plane of Instrument Landing System**: Designed runway simulator and reciever using both time and frequency based algorithms. *[Implementation of portable ILS Localizer signal receiver using SDR, Chanan Leosrisook,2014]*

EDUCATION

Universität Bremen, Germany Oct 2024 - Present
Masters of Science: Space Science & Technology
- **Courses:** Communication Technologies for Space, Space Electronics, Control Engineering, Space Science and Exploration Missions

Sardar Vallabhbhai National Institute of Technology, India Aug 2017 - May 2021
Bachelor of Technology Electronics & Communication Engineering *GPA: 6.88/10*
- **Courses:** Satellite Communications, Wireless & Mobile Communications, Data Communication & Networks