Gaurav Agarwal

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"Dream big, start small. But most of all, start."

Summary

I have 7+ years of experience spanning all phases of the software development lifecycle, with a proven track record of delivering results in diverse environments which includes cutting-edge aerospace R&D labs, agile startups, and large-scale enterprises. What drives me is to deepen my expertise, embrace state-of-the-art technologies, and contribute to forward-thinking organizations by developing technology-agnostic, innovative solutions in challenging and dynamic domains.

Education

P.E.S Institute of Technology, Autonomous Institute under VTU, Belgaum *Bengaluru, India*

B.E in Electrical and Electronics Engineering *Aug.'13 - May'17*

- GPA: 8.93/10.00
- Major Courses: Embedded System, Control Systems, Digital Signal Processing

Kerala Samajam Model School (KSMS) *Jamshedpur, India*

I.C.S.E, I.S.C in Pure Science with Computer Application *Mar'99 - May'13*

- ICSE: 93.4%, ISC: 88.75%

Technical Skills

Programming Languages	C, C++, Python, Bash, Go, Java, SQL, Matlab & Simulink, LaTeX
Embedded Development	Linux (Yocto, Buildroot), RTOS (DEOS, VxWorks, FreeRTOS), Device Drivers, BSP
DevOps & Tools	Git, GitLab CI/CD, Jenkins, Docker, Kubernetes, Doxygen, CVE, Polyspace, Postman
Communication Protocols	UART, SPI, I2C, CAN, ARINC, ADC, HTTP/HTTPS, REST APIs, WebSockets, TCP/IP, MQTT, FTP
Operating Systems	RTOS (DEOS, VxWorks, FreeRTOS), Linux (Ubuntu, CentOS, Yocto, Buildroot), Windows
Cloud & Networking	AWS (EC2, S3, Lambda), Azure, Nginx, Docker Swarm, Load Balancers, Reverse Proxies

Work Experience

Boeing India Pvt. Ltd. *Bengaluru, India*

Software Engineer 2 | Embedded & Avionics Systems *Nov'19 - Present*

- Designed, developed, and maintained architectures, requirements, algorithms, interfaces, and designs for **avionics** software systems across diverse product lines. Conducted feasibility studies, created robust architectures, and collaborated with cross-functional teams to ensure alignment with regulatory standards.
- Architected and integrated software components into fully functional systems leveraging **RTOS** or **Linux**-based platforms, utilizing a variety of programming languages and technologies. Conducted in-depth requirements analysis, architectural design, and peer reviews, ensuring full traceability and the delivery of maintainable, high-quality software solutions.
- Developed and maintained build infrastructure, platform services, middleware frameworks, real-time communication protocols, diagnostic tools, and mission-critical application software for **avionics** systems, ensuring high scalability, performance optimization, fault tolerance, secure data handling, and seamless integration across flight and hardware-in-the-loop simulation environments
- Configured custom hardware architectures and optimized Board Support Packages, including U-Boot, kernel, custom **Yocto** recipe-based root file systems, cross-compilation toolchains, and device trees, to enable efficient secure boot processes and enhance runtime performance for custom hardware platforms.
- Designed and implemented automated CI/CD pipelines with GitLab CI and Docker, streamlining build, integration, and deployment processes to ensure consistent and reliable software releases.

Team Indus (Axiom Research Labs Pvt. Ltd.) *Bengaluru, India*

Flight Software Engineer | Integrated Avionics | Command & Data Handling | Guidance, Navigation & Control *Jul.'17 - Present, **Intern**: Jan.'17 - Jun.'17*

- Developing software systems for **orbital**, **descent** and **surface** phases of the soft landing lunar mission, with onboard state estimation, autonomous attitude correction, lunar terrain feature tracking, active thermal and power control, interface drivers for sensors peripherals and other interfacing cards, with limited fault detection, isolation, and recovery.
- Writing, analyzing, and maintenance of software requirements for Lander **On-Board Computer(L-OBC)**, **Auxillary Flight Computer (L-AFC)** and Rover **On-Board Computer(R-OBC)**. Studying the feasibility with present architecture, providing solutions for each module development and final independent verification and validation.
- Design and testing of telecommand packet definition for the entire lunar landing mission: real-time, absolute time-tagged, patch, differential time-tagged, configurable block and event-based commands.
- Developing frameworks for running regression unit, interface and integration level of testing with auto code generation capabilities which involves sensor and other interface cards emulation using **Interface Emulation Card (IEC)**, board bring-ups for **Integrated Avionics Unit (IAU)**, and generate reports for each activity.
- Developed framework for **Processor in Loop Simulation (PiLS)** system emulating sensor and actuator electrical interfaces to IAU.

Academic Projects

Student Team Lead *Bengaluru, India*

PISAT- a nano-satellite project executed by **CoRI**, P. E. S. University launched aboard PSLV C-35 on 26th Sept'16 *Oct. 2014 - Dec. 2016*

- Involved in complete design, development, assembly, integration and testing phase of **PISAT**- a nano-satellite student project funded by ISRO and PES University. Worked in following subsystems under the expertize of ex-ISRO scientists:
- System Engineering: Subsystem level requirements collation, design and development life cycle, complete verification and validation for both hardware and software.
- OBC and ADCS: The subsystem included building real-time software for an imaging satellite in a component base manner which managed overall functionality such as attitude determination, control systems, telemetry and telecommand (RTE) on an Atmel **AT32UC3A0512** microprocessor with bare-metal architecture. Build test frameworks for scenario-based testing, open-loop and closed-loop simulations.
- Payload: Develop **NanoCam C1U** functionality, operations and test bench for a complete analysis of the setting of the camera parameters.
- Assembly, Integration and Testing: Build robust test system which emulated sensors, interface cards and ground software. It was used for Avionics bring ups, **On-board in Loop Simulation (OiLS)**, independent verification of telemetry, telecommand, payload interface and ground checkout.
- Mission Planning and Operations: Reviewing and making of the detailed design documents for CDR, PSR, PLR, the sequence of events, PISAT in orbit tracking and post data analysis.

Smart Energy Meter using Intel Galileo Gen2 *Bengaluru, India*

Open-ended Project, Intel IoT Labs, P. E. S. University *Jun'15 - Jan'16*

- An Intel IoT Platform Project where Galileo board sends the real-time computer power values to the server using MQTT protocol for the user to monitor the consumption
- Intel ThingSpeak Cloud is used as a server to upload the data and do further analysis via in-built MATLAB toolkit

Awards and Accolades

Jan'16	**APCOSEC'16- Asia Oceania Systems Engineering Conference**, Published a paper titled "Design of a student satellite -PISAT"	*Bengaluru, India*
May'16	**Bronze Award in System Engineering Challenge organized by INCOSE**, Presented a Paper Titled "Telemetry and telecommand for PISAT"	*Bengaluru, India*
Mar'13	**State Rank 1**, International Olympiad of Science and Mathematics, Silver Zone	*Jamshedpur, India*