Gaurav Agarwal

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

Summary

Software Engineer with around 4 years of experience, having interest in hands-on development, end-to-end system design, and software architecture with a base in embedded systems, data structures, and algorithms, strong aptitude in problem-solving, and exposure to handling complete ownership of components and driving projects independently. Looking forward to expanding my domain and working on state-of-the-art technologies while contributing to the growth of a dynamic and progressive organization.

Education

P.E.S Institute of Technology, Autonomous Institute under VTU, Belgaum — *Bangalore, 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	C, C++, Python, Bash, Matlab & Simulink, Java and LaTeX
DevOps	Atlassian Tools, Jenkins, Docker, Gitlab, Doxygen, LCov, and Polyspace
Microcontroller Architecture	ARM, SPARC and AVR
Protocols	UART (RS232, RS422, RS485), SPI, I2C, ARINC, ADC, PWM
Operating Systems	RTOS (DEOS, VxWorks), Linux (Ubuntu, CentOS, Linaro), Windows

Work Experience

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

Team Indus Skywalker, Flight Software | Integrated Avionics | Command & Data Handling — *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.
- Interface drivers for protocol establishment with the **(L-OBC)**, **L-AFC**, **R-OBC**, other interfacing cards and sensors.
- Developed software system to perform an **autonomous lunar descent sequence**, with the onboard estimation of lander states, constrained landing site selection, targeted descent to the selected landing site and mode transition logic.
- 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 Lander OBC boot architecture, custom linkers, make system and maintaining different configurations for Atmel's RAD Hard **ATF697FF** - **SPARC V8** processor operated as bare metal with **Round Robin** scheduler
- 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.
- Developing and testing embedded applications for **L-AFC** and **R-OBC** which runs on barebones Linux. Building kernel, firmware for the SoC using Petalinux and Buildroot toolchain.
- Maintain a complete dashboard for Flight Software team for coverage on code development, documentation and post-tests analysis.
- Review Software artefacts created by the team members from time to time for **JPL** code compliance and **MISRA C - 2014** guidelines.

Academic Projects

Student Team Lead

Bangalore, 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** micro-processor 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

Bangalore, 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

Program Committees

TeamIndus Foundation

Bangalore, India

MEMBER *Aug'17 - Present*

- Invited to be a judge at "ASTRA Satellite Design Hackathon" organized by **SEDS VIT**, Vellore
- Organize and mentor school students for "Robotic workshops"
- Gave a guest lecture on "Lunar Exploration Challenges" at **NMIS**, Jaipur

Project Swanthana, Oracle Financial Services

Bangalore, India

VOLUNTEER *Jan'18 - Present*

- Organize activities for developmentally challenged kids in Swanthana

Collegiate Social Responsibility Club (CSR), P. E. S. University

Bangalore, India

CORE TEAM MEMBER *Aug'13 - May'17*

- Lead a team of 100+ individual for some social welfare activities like Blood Donation Camps, Medical Camps, Orphanage Visit, to name a few.

IEEE Student Branch, P. E. S University

Bangalore, India

CORE TEAM MEMBER *Jan'15 - Dec'16*

- Part of the 15-member core team responsible for organizing technical workshops, talks and designed yearly magazines.

Space Research Club (SPARC), P. E. S. University

Bangalore, India

SECRETARY, EVENT PLANNING AND EXECUTION *Nov'15 - May'17*

- Kickstarted an initiative for students to collaborate towards projects/competitions in the space domain, organize talks and workshops given by ex-ISRO experts.

Prakalpa PES Annual Exhibition, P. E. S. University

Bangalore, India

PRESENTER | ORGANIZER *Mar'14 - Mar'16*

- Poster presentions, showcase demo's of prototypes for Crucible of Reseach & Innovation, IEEE student branch.

PES Annual Cultural- Techno Fest AatmaTrisha, P. E. S University

Bangalore, India

EVENT ORGANIZER, TECHNICAL AND INFORMAL EVENTS *Mar'14 - Mar'16*

- Organized and hosted various technical and informal events.

Awards and Accolades

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