Anshul Jain

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OBJECTIVE

Driven and hardworking professional with a strong foundation in Engineering Mathematics, Physics, and System Design. As a Graduate Aerospace Engineer and passionate educator, I am eager to take on new challenges that allow me to utilize my skills in strategic planning, training and development, relationship building, and project management. Proven ability to lead cross-functional teams, mentor peers, and simplify complex technical concepts into accessible lessons and hands-on demonstrations. Committed to showing up as my authentic self, following my passions, and adding meaningful value to every role I undertake. Seeking teaching opportunities where I can use my background and expertise to inspire curiosity, analytical thinking, and a lifelong love for learning in students.

EDUCATION

- **University of Colorado Boulder** — Aug 2023 – Dec 2025
  Master's in Aerospace Engineering Sciences — *Boulder, CO*
- **R. V. College of Engineering** — Aug 2019 – Apr 2023
  Bachelor's in Aerospace Engineering — *Bengaluru, India*

Programming and Tools: MATLAB, Simulink, Python, C, C++, JavaScript, R, VS Code, Git, GitHub, Canvas.

CORE COMPETENCIES

- **Mathematics:** Calculus, Linear Algebra, Matrix Algebra, Eigenvalue Analysis, Differential Equations, State-Space Modeling, System Identification, Curve Fitting, Transfer Function Analysis, Optimization, LQR and Feedback Design, Probability, Statistics, Gaussian Transformations, and Numerical Simulation.
- **Physics:** Rigid-Body Dynamics, Rotational and Translational Motion, Torque Analysis, Fluid Resistance, Aerodynamics, Control Systems, Frequency-Domain Methods (Bode, Nyquist, Stability Margins), and System Stability Analysis.
- **Instructional Skills:** Curriculum Planning, Lesson Preparation, Classroom Facilitation, Student Guidance, Academic Support, and Educational Communication.
- **Technical Tools:** MATLAB, Simulink, Python, C, C++, JavaScript, Git, VS Code, Canvas.

TEACHING EXPERIENCE

- **Teaching Assistant** — Aug 2023 – Oct 2025
  University of Colorado Boulder — *Boulder, CO*
  - Taught undergraduate laboratories including **EBIO 1110: Biology and Society**, and **EBIO 1230/1240: General Biology**, guiding 50+ students through experiments that connected theoretical and real-world biological and mathematical principles.
  - Developed and implemented lesson plans, lab manuals, and problem sets that simplified complex concepts into intuitive, hands-on learning experiences.
  - Trained students on lab safety procedures and proper operation of biological laboratory equipment, ensuring a safe and productive environment.
  - Communicated regularly with students and faculty to coordinate testing accommodations, address course-related concerns, and resolve academic or logistical issues.
  - Maintained and updated course Canvas pages, announcements, and discussion boards to build a strong virtual learning presence and improve student engagement.
  - Monitored student performance and participation through grade tracking and feedback systems, identifying learners needing additional support or guidance.
  - Gathered student feedback through mid-semester check-ins and end-of-term evaluations to assess teaching effectiveness and improve course delivery.
  - Collaborated with faculty and departmental staff to enhance instructional quality, ensure accessibility compliance, and promote a positive learning culture.

- **Mentor, Recovery Subsystem Engineer** — Oct 2019 – Aug 2022
  Team Antariksh, R. V. College of Engineering — *Bengaluru, India*
  - Mentored junior team members in the principles of **aerodynamics, fluid mechanics, and system modeling** by connecting theory with real-world rocketry applications.
  - Guided students through the design and analysis of **dual-parachute recovery systems**, explaining concepts such as drag force, lift generation, pressure distribution, and momentum transfer.
  - Led workshops demonstrating how parameters like parachute diameter, mass, and air density affect terminal velocity and stability during descent.
  - Supervised CFD and experimental tests to validate theoretical results, helping students interpret data and refine their understanding of physical principles.
  - Developed visual explanations and calculation templates to enhance comprehension of recovery dynamics and stability criteria.
  - Derived analytical relationships between drag coefficient and Reynolds number to assess performance under varying flow regimes.
  - Documented design iterations, test results, and analytical findings in technical reports to support subsystem validation and team knowledge retention.
  - Encouraged teamwork and scientific reasoning by fostering a collaborative environment focused on applying physics to practical engineering problems.

PROJECTS

Automatic Control Systems – Spacecraft Attitude Control Projects   Jan 2024 – May 2024
University of Colorado Boulder   *Boulder, CO*

- Analyzed spacecraft mockup frequency-response data to derive mathematical models representing rotational dynamics through curve fitting, transfer-function formulation, and Bode/Nyquist interpretation.
- Translated frequency-domain characteristics into state-space representation to study system stability, controllability, and observability using matrix algebra.
- Designed and optimized feedback and observer controllers via pole placement and LQR principles, quantifying system behavior through eigenvalue analysis, damping ratios, and bandwidth metrics.
- Simulated time-domain responses under step and sinusoidal inputs to illustrate control trade-offs between response speed, actuator saturation, and dynamic stability.

Attitude Determination and Control Module   Aug 2023 – May 2024
University of Colorado Boulder   *Boulder, CO*

- Applied principles of rotational dynamics and rigid-body kinematics to design a CubeSat attitude control system meeting sub-arcsecond pointing requirements.
- Derived and implemented mathematical models based on Euler's equations of motion and feedback stability analysis to evaluate control performance.
- Developed a Digital Sun Sensor model in C++ using the Basilisk framework to simulate sensor-based attitude estimation under realistic illumination conditions.
- Collaborated with team members to analyze inertia tensor effects, control torque interactions, and system stability trade-offs through simulation-driven discussions.

Speed Control of a Brushless DC Motor using LQR   May 2022 – June 2022
R. V. College of Engineering   *Bengaluru, India*

- Formulated the dynamic model of a brushless DC motor using differential equations representing voltage–current and torque–speed relationships.
- Designed and implemented a Linear Quadratic Regulator (LQR) in MATLAB to minimize state error and control effort under varying load conditions.
- Analyzed system stability, transient response, and steady-state accuracy through eigenvalue placement and performance metric evaluation.
- Collaborated with peers to interpret the effects of feedback gain tuning on overall control efficiency and physical system behavior.

Mathematical Image Modeling   May 2022 – June 2022
R. V. College of Engineering   *Bengaluru, India*

- Developed mathematical models in MATLAB to animate images by transforming pixel brightness distributions using Gaussian functions.
- Applied concepts of probability, normalization, and curve fitting to analyze the effect of mean and variance on image intensity patterns.
- Explored correlations between spatial frequency content and visual perception to interpret image transformations mathematically.
- Collaborated with peers to evaluate numerical results and optimize model parameters for smoother intensity transitions.

RESEARCH EXPERIENCE

Co-Author, 73rd International Astronautical Congress   Nov 2021 – Sept 2022
Team Antariksh   *Bengaluru, India*

- Vageesha S, Darpan B, Trisha A, Anshul Jain, Greeshma A, Rithwik R, "Study of Drag Characteristics of a Parachute for landing on planets and moons with different atmospheric conditions and its optimization using gases with varying properties".

AWARDS AND RECOGNITION

SAARTHAKA Trust Scholarship   Jan 2020
R. V. College of Engineering   *Bengaluru, India*

- Awarded for securing **Rank 1 in Aerospace Engineering (2019)** among all first-year students.

E-Summit Business Marathon – 1st Place   July 2022
R. V. College of Engineering   *Bengaluru, India*

- Ranked **1st out of 32 teams** for developing a service-based transport solution addressing damaged road infrastructure in hilly regions during monsoon conditions.

VOLUNTEER EXPERIENCE

Emcee – Faculty Development Program (FDP)   May 2022
R. V. College of Engineering   *Bengaluru, India*

- Coordinated a 5-day FDP on Machine Learning applications in Aerospace Engineering, facilitating sessions, managing logistics, and ensuring smooth communication between faculty and participants.

Emcee – RSS Vishwa Sangh Shibir   Dec 2015
Rashtriya Swayamsevak Sangh   *Indore, India*

- Served as the Tamil-language Emcee for the international conference, engaging with delegates from 45+ countries after rapidly acquiring conversational proficiency in the language.

LANGUAGES

- English: Professional Proficiency

- Hindi: Native Proficiency