



# YUVAL BANSAL

Senior Undergraduate  
Department of Mechanical Engineering  
Indian Institute of Technology Kanpur

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Examination	Degree/Certificate	Institute	Year	CPI/%
Graduation	B.Tech	Indian Institute of Technology Kanpur	2022-2026	7.8/10
Intermediate/+2	CBSE(XII)	Delhi Public School, Maruti Kunj, Gurgaon	2022	94%
Matriculation	CBSE(X)	Delhi Public School, Maruti Kunj, Gurgaon	2020	95.6%

## ACHIEVEMENTS

- Secured an **All India Rank 3046** in **JEE Advanced 2022**, conducted by IIT Bombay among 1.65 lakh shortlisted candidates.
- Secured an **All India Rank 3226** in **JEE Mains 2022**, conducted by National Testing Agency (NTA) among 10+ lakh participants.
- Won **Bronze Medal** at **Inter IIT Tech Meet 13.0** (IIT Bombay) in the problem statement by Albatross Energetics among 23 IITs.

## WORK EXPERIENCE

### Data Engineer Intern | [🔗](#) May'25 - Jul'25

Semusi Technologies

- Built **generic ETL Pipeline** with **PySpark**, automating extraction and transformation of related datasets from multiple databases like **PostgreSQL** and **MinIO** into single golden destination.
- Developed an **Ensemble Model** combining **Random Forest**, **Logistic Regression**, and **Gradient Boosted Trees**, and improved interpretability by training a surrogate decision tree to approximate ensemble decisions and generate rule-based explanations.
- Dockerized** the ecosystem for portability and reproducibility.
- Achieved high **ROC-AUC scores** for RF (0.94), LR (0.95), GBT (0.83) where the ensemble model reached **96% accuracy**.

### Energy Systems Simulation Intern | [🔗](#) Apr'24 - Sept'24

Energy Internet Corporation

- Formulated a model of air-compression energy storage system achieving compression of air from 1 atm up to **250 atm**.
- Simulated a **digital twin** of the system in **MATLAB Simulink** using **Simscape Fluids** along with a feedback control loop.
- Researched about hydraulic transformers to improve efficiency and designed a piston-transformer model achieving **40 atm**.
- Built interactive **PyGame** simulation with customizable parameters that can be used to design physical energy storage system.

### Technical Organizer WCEAM | [🔗](#) Jan'24 - Oct'24

World Congress of Engineering Asset Management 2024

- Coordinated technical operations of the conference with faculty from IIT Kanpur, IIT Kharagpur and University of Pretoria.
- Built a **website for the conference** and automated workflows for registration, submission of papers and raising sponsorships.
- Helped the conference receive **150 abstract submissions** and raise **Rs. 1 lakh** from registrations and various sponsorships.

## KEY COMPETITIONS

### Inter IIT Tech Meet 13.0, IIT Bombay | [🔗](#) Dec'24

Albatross Energetics

- Won **Bronze Medal** at Inter IIT Tech Meet 13.0 problem statement by Albatross Energetics, for IIT Kanpur among 23 IITs.
- Simulated the thermodynamic HVAC cycle with performance analysis in **MATLAB/Simulink** and demonstrated innovative solutions for safe operation under varying loads at **IIT Bombay**.
- Optimized energy efficiency through parameter tuning and control strategies, achieving average EER of 11.35 and ISEER of 3.33.

### Inter IIT Tech Meet 12.0, IIT Madras | [🔗](#) Dec'23

Solinas Product Design Challenge

- Represented IIT Kanpur in Inter IIT Tech Meet 12.0 and secured **fourth position** among the 22 participating IITs at **IIT Madras**.
- Designed an extendable agitator (1 m to 5 m) for applications of efficient sewage cleaning aiming to replace manual scavenging.
- Built 3D model in **SolidWorks** with Bluetooth-based control.
- Delivered a strong and portable agitator with 350 N-m torque bearing capacity, weighing 90 kg with a user-friendly design.

## RELEVANT COURSES

Theory of Mechanisms and Machines (A\*)  
Fundamentals of Computing (A)

Partial Differential Equations  
Fundamentals of Electronics

Linear Algebra  
Complex Variables

Applied Probability and Statistics  
AI/ML For Designers

## POSITIONS OF RESPONSIBILITY

### Institute Secretary, Events and Competitions | [🔗](#) Mar'25 - Present

Science and Technology Council, IIT Kanpur

- Elected as **Institute Secretary** of the **Science and Technology Council, IIT Kanpur**, to foster innovation and student engagement across technical domains while managing a budget of **Rs 18 lakhs** to strategically fund projects, competitions and events.
- Directed a 4-tier structure of **500+ students** in 12 clubs/societies and 6 teams, executing **60+ summer projects** and multiple other projects for 400+ sophomores with peer-led mentorship.
- Organized **Takneek**, the inter-hall technology festival, curating 50+ problem statements with faculty collaboration and achieved **100+ active participants** among freshers and sophomores.

### Coordinator, Robotics Club | [🔗](#) Mar'24 - Mar'25

Science and Technology Council, IIT Kanpur

- Led a team of **30 members**, strategically managed the annual budget of **Rs 4 Lakhs** and an inventory worth over **Rs 10 Lakhs**.
- Represented IIT Kanpur in prestigious robotics competitions including WRC, GujCOST Robofest 4.0, Techkriti, and Techfest.
- Led multiple robotics projects like **Maze Solver**, **Line Follower**, **Self-Balancing Robot**, **Inverted Pendulum**, and **Battlebot**.

## KEY PROJECTS

### Match Forecasting | [🔗](#) May'24 - Jul'24

Amex Campus Challenge 2024

- Predicted cricket match results using various **Boosting Algorithms** based on a primary dataset of over 900+ match data.
- Utilized three Secondary Datasets for making 18 additional features, and thereby multiple feature importance metrics.
- Deployed **Random Forest Classifier**, **Recursive Feature Elimination** and **Principle Component Analysis** for fine-tuning.
- Achieved **65.7%** accuracy on multiple unknown cricket datasets using the **LightGBM Boosting Algorithm** for classification.

### Sensor Integration and Visualisation in ROS | [🔗](#) May'23 - Jul'23

Robotics Club, IIT Kanpur

- Integrated sensor data from **GPS**, **Inertial Measurement Unit**, **Rotary encoders**, and **RPLIDAR** for autonomous navigation.
- Introduced to simulation on **Gazebo** using description formats like **URDF** and **SDF**, and implemented on **TurtleBot3** platform.

### Gyrobot: Self Balancing Robot | [🔗](#) May'24 - Jul'24

Robotics Club, IIT Kanpur

- Mentored 10 freshmen to build a **self-balancing two-wheeled robot**, implementing a **PID controller** on pitch data for stability.
- Processed real-time data from an **MPU6050 IMU sensor** and actuated motors to maintain vertical balance while locomotion.

### CWC Website Development | [🔗](#) Jan'24 - Apr'24

Community Welfare Cell, IIT Kanpur

- Built a website for the **Community Welfare Cell** of IIT Kanpur to make CWC more approachable to the campus community.
- Helped in spreading awareness about various wings and humanitarian activities carried out by CWC through the website.

## TECHNICAL SKILLS

- Languages:** C, C++, Python, Go, HTML, CSS, JavaScript, **LaTeX**
- Frameworks & Libraries:** ReactJS, NextJS, Numpy, Pandas, Matplotlib, PySpark, TensorFlow, PyTorch, OpenCV, Node.js
- Dev Tools:** Bash, Git, Docker, MongoDB, PostgreSQL, MinIO
- Simulation & Robotics:** ROS, Gazebo, RViz, Arduino, MATLAB, Simulink, Fusion 360, SolidWorks, AutoCAD, PyGame, PySim