

Pranav Shrikant Page

☎ +91 9370255659 • ✉ pranavpage33@gmail.com • 🌐 pranavpage.github.io

Education

IIT Bombay

B.Tech + M.Tech, Electrical Engineering

Mumbai

2018–2023

CPI: 9.20/10, **Specialization:** Communications and Signal Processing, **Minor:** Computer Science

Publications and Patents

- **P. S. Page**, A. S. Siyote, V. S. Borkar, and G. S. Kasbekar. “Node Cardinality Estimation in the Internet of Things Using Privileged Feature Distillation.” *IEEE Transactions on Machine Learning in Communications and Networking*, vol. 2, 2024. [DOI]
- **P. S. Page et al.** “Distributed Probabilistic Congestion Control in LEO Satellite Networks.” *Proc. 15th Intl. Conf. on Communication Systems & Networks (COMSNETS)*, Bangalore, India, 2023. [DOI]
- Y. Sharma, A. Marathe, V. Bhalerao, V. Shenoy, G. Waratkar, D. Nadella, **P. S. Page et al.** “The Search for Fast Transients using CZTI.” *Journal of Astrophysics and Astronomy*, 2021. [DOI]
- **P. S. Page**, S. Jeurkar. “Low Cost Bio-waste Fuel Briquettes and Method of its Manufacturing Thereof.” Indian Patent No. 378827, filed July 8, 2016, granted October 7, 2021.

Work Experience

Carnot Technologies

Data Scientist

Mumbai

Aug 2024 – Present

- Developed the **Fleet Analytics Platform** for owners of 10–500 tractors, combining real-time telemetry with alerts and usage stats; integrated with **ERP systems** used by sugar mills, aggregators, FPOs, and plantations to improve uptime and operational efficiency.
- Contributed to the **OEM Intelligence Suite** built on data from over **30,000 OEM** and **15,000 aftermarket tractors**; merged telemetry with **rainfall, weather**, and **cropping patterns** to identify **user behavior clusters**, define **personas**, and analyze **market composition** for OEM clients like **Mahindra** and **Swaraj**.
- Trained ML models for **harvest detection** (78% accuracy using SAR imagery) and **high-yield farm classification** (70% accuracy); deployed in a tool used by sugar mills in India for planning and procurement.
- Deployed **Beckn-compliant APIs** for tractor rental discovery on the UKI network; partnered with an agri advisory startup to enable in-app access and support live transactions.
- Built an internal **Text2SQL assistant** with a **Streamlit chat UI** for querying production databases. Used vector search over curated queries, business terms, and schemas to construct prompts; generated SQL via LLM and returned results with automated summaries and charts.

Qualcomm

PHY Modeling Engineer

Bangalore

Jul 2023 – Jul 2024

- Contributed to PHY design for upcoming Qualcomm Wi-Fi chips targeting **AP/STA** devices, modeling **packet boundary detection, symbol timing**, and synchronization algorithms under evolving **IEEE 802.11** standards.
- Implemented and optimized receiver algorithms in **C++**, achieving a **0.5 dB sensitivity gain** in a key edge case by refining coarse and fine symbol timing logic.
- Collaborated with systems,RTL and validation teams to translate PHY algorithms into silicon
- Maintained and improved modeling infrastructure using **Jenkins CI, Perforce**, and custom scripts; supported clean builds, code quality enforcement, and multi-trunk workflows across teams.

Scholastic Achievements

- **Advanced Placement (AP)** distinction in Physical Chemistry — awarded to top 11 of 1023 students.
- Selected in the top **1% nationwide** in **INPhO** and **INChO** Olympiad stages for International representation.
- Secured **AIR 275 in JEE Advanced 2018** and **AIR 250 in JEE Main 2018**, among over a million candidates.
- Awarded the **KVPY Fellowship** (SA 2017, SX 2018) by IISc with AIRs **318** and **402**.
- Recipient of the **NTSE Scholarship** by NCERT — awarded to top 1000 students nationwide.

Research Experience

IIT Bombay, EE Department

Node Cardinality Estimation in Wireless Networks

Prof. Gaurav Kasbekar, Prof. Vivek Borkar

Jan 2023 – Jul 2023

- Proposed a **Privileged Feature Distillation (PFD)** method using a **teacher-student neural network** for node count estimation in IoT/RFID networks.
- Enabled fast estimation using real-time features; extended to **heterogeneous networks** with $T \geq 2$ device types.
- Achieved up to **94% lower MSE** than prior state-of-the-art (SRCs, T-SRCs) on real and synthetic datasets.

IIT Bombay, EE Department

Routing in Satellite Networks

Prof. Gaurav Kasbekar

May 2022 – Aug 2022

- Proposed a **distributed probabilistic congestion control** algorithm to minimize end-to-end delay in **LEO satellite networks**, using only local traffic state from neighbors.
- Developed a custom **discrete-event network simulator** in **Python 3**, similar in functionality to ns-3, to evaluate routing performance under dynamic load and buffer constraints.
- Demonstrated up to **5.1 ms lower delay** vs. the Datagram Routing Algorithm (DRA) at high input rates—comparable to one-hop propagation delay.
- Analyzed system behavior under varying buffer sizes; showed that the proposed algorithm outperforms DRA

IIT Bombay, Physics Department

Compton Imaging and Reconstruction

Prof. Varun Bhalerao

Jan 2021 – Apr 2022

- Simulated **hard X-ray imaging experiments** for astrophysical sources using **MEGALib** (built on **GEANT4**) to model photon interactions in **CZT detectors**.
- Demonstrated feasibility of imaging in an upcoming mission by developing a custom **Compton back-projection algorithm** in **C++** with **OpenGL** for 3D visualization and event reconstruction in lab conditions
- Presented findings at the **40th Annual Meeting of the Astronomical Society of India**, March 2022.

Technical Skills

- **Machine Learning & Modeling**: Built production ML pipelines for time-series forecasting, SAR imagery classification, and **knowledge distillation**-based student-teacher models using **PyTorch** and **TensorFlow**; implemented Text2SQL workflows and AutoML for decision support.
- **LLM Applications & Tooling**: Designed internal chatbot using **LangChain**, **FAISS**, and **ChromaDB**, with prompt templating, schema/business-term retrieval, and gold-query examples; handled SQL generation, validation, and charting.
- **Data Engineering & Analytics**: Built analytics layers and dashboards using **PostgreSQL**, **Plotly**, and **Metabase**; integrated telemetry analytics with ERP systems and Beckn APIs for real-time agri-intelligence.
- **Cloud & Infrastructure**: Deployed APIs and internal tools with **FastAPI** and **Docker** on **AWS** (ECS, Lambda, EC2, S3, **CloudWatch**) and **Azure**; managed infrastructure with **Terraform** and CI/CD with **Jenkins**.
- **Development Tools & Languages**: Proficient in **Python**, **C++**, **SQL**, **Bash**, **OpenGL**; experienced in **Linux** systems for scripting, debugging, and deployment; version control with **Git**, **GitHub**, and **Perforce**.
- **Domain-Specific Tech**: Worked with **Beckn Protocol** (UKI), **Wi-Fi PHY modeling** (IEEE 802.11), **LEO satellite routing**; developed geospatial intelligence tools for agri-tech and IoT platforms using real-time telemetry.

Side Projects & Highlights

- Invited by the **Indian Air Force** to **Sulur Air Force Station** to collaborate with industry leaders on **technology indigenization** and operational challenges, following open challenge submissions to the IAF and Indian Army.
- Won **Gold Medal** at the **Inter-IIT Tech Meet 2022** for solving ISRO's challenge on **automated solar flare detection** in X-ray time-series data.
- Designed and built a **solar vegetable dehydrator** to preserve nutrients post-harvest and reduce crop wastage — aimed at low-cost deployment for increasing farmer income.
- Developed and patented a method to manufacture **low-cost bio-waste fuel briquettes** using sugarcane factory by-products (bagasse, sawdust, coal dust); designed for **clean combustion** and **low-emission rural energy** applications. Patent granted in 2021.
- Served as a **Convener of Krittika – The Astronomy Club**, leading **stargazing sessions**, maintaining telescopes, and organizing dark-sky observation trips.
- Mentored juniors at IIT Bombay as an **Institute Student Mentor**, **Department Academic Mentor**, and **Teaching Assistant** — supporting academic and lab-based learning.