Hansini Rajesh

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Education

Cornell University — Ithaca, NY
MPS in Applied Statistics — *Aug 2025 – May 2026*

Vellore Institute of Technology — Chennai, India
Bachelor of Technology in Computer Science — *Sep 2021 – May 2025*

Projects

Panel Projection Modeling (CDC/National Center for Health Statistics) — Jan 2026 – Present
R, Python, Survey Weighting, Statistical Modeling

- Developing a statistical weighting framework to align commercial survey panel estimates with National Health Interview Survey (NHIS) benchmarks.
- Modeling and adjusting for coverage, selection, and mode bias across multiple survey panels and data collection modalities.
- Benchmarking revised health estimates against public-use NHIS data across demographic subgroups and implementing reproducible R/Python pipelines with variance and reliability estimation.

Deep Learning for Multi-Frequency SZ Component Separation — Jan 2026 – Present
Python, PyTorch, CMB / SZ Astrophysics

- Exploring deep learning approaches for separating Sunyaev–Zel'dovich (SZ) signals from CMB and astrophysical foregrounds in multi-frequency sky maps.
- Implementing prototype architectures in PyTorch and generating simulated CMB, SZ cluster, and foreground maps to create initial training and evaluation datasets.
- Running preliminary experiments and comparisons with classical component separation methods (e.g., ILC, matched filters) to assess feasibility and guide future model design.

AI-Powered Indoor Navigation for the Visually Impaired — Jan 2025 – May 2025
iOS, Swift, ARKit, YOLOv8, A Pathfinding*

- Built an on-device AR navigation prototype for visually impaired users, combining Apple ARKit with real-time scene understanding.
- Integrated a YOLOv8 object detector to identify indoor obstacles from the camera stream and trigger speech-based hazard alerts.
- Implemented A* pathfinding on vectorized floor plans to generate turn-by-turn routes and evaluate navigation success rate and path deviation under dynamic obstacles.

Publications

Multi-Modal Driver Behavior Analysis and Speed Estimation using Fusion of Computer Vision and In-Car Sensor Data — Apr 2024
IEEE – Co-author

- Proposed a multi-modal sensor fusion framework integrating computer vision and in-car sensor data for driver behavior analysis.
- Designed deep learning models for vehicle speed estimation and driver state classification.
- Demonstrated improved accuracy and robustness over unimodal approaches using study-defined error and agreement metrics for speed and behavior labels.

Experience

Student Researcher, Applied Statistics — Jan 2026 – Present
Cornell University — *Ithaca, NY*

- Clean and analyze large, real-world datasets in R and Python, including EDA, visualization, and development/validation of statistical and machine learning models for applied research projects.
- Collaborate with faculty and graduate students on experiment design, reproducible workflows, and documentation.
- Recent work includes assisting on *LLM versus LL.M.: Comparing Human and AI Coding of Constitutional Law*, an empirical study comparing large language models with LL.M. students in coding hundreds of constitutional variables across global constitutions.

Software Engineer Intern — Sep 2023 – Dec 2023
Punt Review — *Dubai, UAE*

- Contributed to the early-stage design and development of Punt Review, a consumer web platform, focusing on core user-facing pages.
- Built and tested responsive front-end components using HTML, CSS, and JavaScript to reduce UI defects before launch and improve behavior across devices.
- Worked closely with the founding team to iterate on user flows and interface layouts aimed at improving usability and task completion in pre-launch tests.

Technical Skills

Programming: Python, R, SQL, C, C++, Java, JavaScript
Machine Learning / Data: Pandas, NumPy, Scikit-learn, PyTorch, PySpark, Data Modeling, Data Wrangling, Statistical Analysis, Quantitative Analysis, Tableau, Power BI, MATLAB
Workflow: Git, Jupyter, VS Code, Docker (basic)
Certifications: Data Science for Engineers (NPTEL), AI & ML (Google Developers)