Satish Panda

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EDUCATION

Bachelor of Technology, Indian Institute of Technology Kanpur

- Cumulative Performance Index: 9.53/10. Expected Graduation: May 2026
- Majors: Electrical Engineering and Computer Science, 5-year Program.

Secondary and Senior Secondary Schooling, Jawahar Vidya Mandir, Ranchi, India

- Class X: 97.6% Class XII: 98.2%

RESEARCH EXPERIENCE

Research Interests

- Algorithms, Machine Learning, Game Theory, Distributed Environments

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IUSSTF-Viterbi Researcher, USC Viterbi School of Engineering (May 2025-present)

- Faculty Mentor: Prof. Evi Micha. On-Site from May-July, Los Angeles, CA, United States. Topic: Proportional Fairness in Clustering. Previous work studies three Offline clustering domains -Classical and Transferable Centroid and Classical Non Centroid.

Project Milestones and Current Work: Manuscript in preparation

- Proved **Impossibility** of clustering guarantee for the natural extension, Transferable Non Centroid. Changed the project course to **Online** Centroid clustering.
- Gave **Existential** and **Constructive** proofs of Online constant order approximation of exact clustering with single recourse for small and large ratios of # agents to # centers.
- Gave **Constructive Exact** Online Clustering in Line and Tree Metrics with recourse 1 and 2 respectively with constant order relaxation on min coalition size for group fairness.

Undergraduate Project, Computer Science and Engineering IITK (Aug 2025-present)

- Faculty Mentor: Prof. Sunil Simon, CSE IIT Kanpur. Topic: Distributed Planning Models.
- Modeling distributed planning environments where each agent has its own objective, controls a set of personal propositions, and is unaware of the truth values of the other's propositions unless communicated by broadcast. Agents have a partial view of the current global state.
- Agent objectives are specified in a restricted LTL specification language incorporating nested epistemic modalities to model communication actions. Questions of decidability and learning.

Course Project in Probabilistic Machine Learning (Jan 2024-Mar 2024)

- Faculty Mentor: Prof. Piyush Rai, CSE IIT Kanpur. Topic: Online Federated Learning.
- Explored various techniques of aggregrating client data to variationally infer a global gaussian giving good estimates of the true mean(on the ridgeline manifold).
- Used Low rank instead of Diagonal covariance in Laplace approximation to observe tradeoff between dimensionality vs better cross covariance approximation of the top k components.

INDUSTRY INTERNSHIP

Architecture Intern, Texas Instruments, Bangalore, India (May 2024-Jul 2024)

- Topic: Addressing Scheme for Mixed Radix, Re-Configurable and Conflict-Free FFTs
- Architecture : addition and modulo concepts on **mixed-base** element indexing, addressing. All factors of max allowable input length (**multiple** prime factors) are valid input lengths.
- Design key: stage-wise pattern of element indexing and tuple formation inherent to FFTs.
- Previous implementations always used multiple/duplicate memories. Proposed **in-place** memory scheme requires a single memory block of size of max input length. Offered full time role to design optimized micro-architectures leveraging innate algorithm properties.

RELEVANT COURSE PROJECT

CHIRON Framework: Compiler Design (Jan 2025- Apr 2025)

- Turtle language teaching compiler with a simple AST and IR developed by Prof Subhajit Roy, IIT Kanpur. Original version does not support variable scoping, functions, threading.
- Augmented grammar to allow for function calls, threading (multiple turtles drawing at once), and added the corresponding AST nodes and visitor functions. Augmented Interpreter to support variable scoping, functions, threading and concurrency.

RELEVANT COURSEWORK AND TECHNICAL SKILLS

- Algorithms, Algorithmic Game Theory, Theory of Computation, Compilers
- Probabilistic Machine Learning and Geometric Models, Statistical Signal Processing, Probability and Statistics. Communication Systems, Information and Coding Theory
- **Programming:** C, C++, Python, Verilog HDL, Javascript. **Architecture:** MIPS, x86

SCHOLASTIC ACHIEVEMENTS

- **Academic Excellence Award** each year of my undergraduate course at IIT Kanpur.
- **JEE** Advanced - Admissions to Indian Institutes of Technology - All India Rank **935 (2021)**.
- **KVPY** national fellowship - All India Rank **771 (2021)**.
- **NTSE** national fellowship - Organized in 2 stages **(2019)**.
- Selected for Indian Contingent to *International Astronomy Olympiad by being among the **top 35** participants in **INAO** - Indian National Astronomy Olympiad. **(2020)**.

  *International Astronomy Olympiad canceled for 2020 due to COVID-19 Pandemic.

EXTRACURRICULAR

- Formal instruction in Hindustani Classical Music(Vocals) and certified in intermediate level.
- Events Organizer for the 2024 IITK spring cultural festival - Techkriti.
- Member of IITK Counseling Service as Sophomore Academic mentor to a group of 30 freshmen to acclimatize them to the academic environment and help navigate first year courses.