Rishu Kumar Singh

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Education

- **Indian Institute of Technology(IIT) Patna** — Patna, India
  BTech in Electrical and Electronics Engineering. **CPI: 8.23** — *Aug 2023 - May 2027 (Expected)*
  - **Relevant Coursework:** Data Science, Probability and Statistics, Introduction to AI/ML, IoT

RESEARCH AND EXPERIENCE

- **AI-NLP-ML Research Lab IIT Patna**
  Undergraduate NLP Research Intern under Dr. Sriparna Saha — *December 2024 - Present*
  - Improved customer support by creating "CompSense," a commonsense-aware Mixture-of-Experts LLM, and a 2.1k-dialogue dataset "GrieveStream". Boosted complaint triage accuracy by up to 28% (achieving 0.78 F1).

- **Zarle Infotech**
  GenAI and ML Intern — *April 2025 - Present*
  - Created an AI-powered voice assistant and dynamic scheduler to personalize student learning. Improved study planning, motivation..

ACHIEVEMENTS

- Ascended into the National level among **top 25 Teams** of India for Asia's Largest Oldest Robotics Competition (IIT Delhi, ABU Robocon), surpassing more than 150 initial participating team
- **Inter IIT Tech Meet 13.0** – Enhanced Chandrayaan-2's CLASS data resolution from 12.5km to 1.25km
- JEE Advanced AIR 6613 – Top **0.5%** out of 1.2 million+ candidates

Projects

- **DenoiseNet-Comparative Analysis of DnCNN vs.U-Net on CBSD68** — **Source Code**
  Tools: TensorFlow/Keras, Scikit-learn, Numpy, Pandas, Python — *March 2025*
  - Developed and optimized DnCNN and U-Net models on the CBSD68 dataset ($\sigma = 35$) , achieving a 2.6 dB PSNR gain over traditional methods and a 5.6% SSIM improvement via hyperparameter tuning.
  - Built an automated evaluation pipeline generating 200+ visualizations and reports, reducing model selection time by 80% and enabling research-grade insights.

- **PillVision - Instance Segmentation of Pills using YOLOv8** — **Source Code**
  Tools: PyTorch, Ultralytics YOLOv8, imgaug, OpenCV, imageio, PIL, numpy, skimage — *February 2025*
  - Built a YOLOv8 segmentation model with 300% dataset growth, achieving high detection accuracy and scalable training.
  - Automated data pipeline with 80% efficiency boost by developing an end-to-end workflow for data preparation, augmentation, and partitioning into 75% training, 15% validation, and 10% testing datasets, significantly reducing manual effort.

- **VidIQ - Video Intelligence and Quality Analysis** — **Source Code**
  Tools: Python, OpenCV, Keras, Scikit-learn, Numpy, Scipy — *January 2025*
  - Developed ML-based video quality modules (e.g., MotionIntensity, Flickering, MosquitoNoise), improving analysis accuracy by 20%.
  - Created predictive LSTM modules for detecting flicker, noise motion artifacts, enhancing detection by 25%

Skills

- **Programming Languages:** Python, C++, SQL, MATLAB, HTML, CSS
- **ML AI Frameworks:** TensorFlow, PyTorch, Keras, Scikit-learn, Hugging Face Transformers, YOLO, OpenCV, NLTK
- **Data Analysis Visualization:** Pandas, NumPy, Matplotlib, Seaborn, Power BI, Tableau, Excel
- **DevOps Cloud Deployment:** MLFlow, Docker, Kubernetes, CI/CD, AWS, Azure, Flask, Streamlit
- **Research Methodologies Algorithms:** Statistical Modeling, ARIMA, LSTM, CNN, Reinforcement Learning

Certificates

- Udemy: Generative AI with Langchain and Huggingface
- Udemy: ML, DL, NLP, Data Science Bootcamp

Position of Responsibility

- **Technical Secretary**, Students' Gymkhana 2024-25, IIT Patna : Managed operations of 16 tech clubs; led 15+ workshops, tech talks, and hackathons.
- **Sub-Coordinator**, Celesta, Techno-Management Fest, IIT Patna : Spearheaded national-level Celesta events with 30+ teams; managed end-to-end logistics, operations, and sponsor engagement.