Kunal Kumar Sahoo

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EXPERIENCE/INTERNSHIP

- **Indian Institute of Technology** — Gandhinagar, IN
  Research Intern (Part-time) — *Aug 2024 - Present*
  - Developing vision-enabled deep reinforcement learning policies to enable an anthropomorphic robotic arm to learn generalized object manipulation movements.

- **Indian Institute of Science** — Bangalore, IN
  Research Intern (Full-time) — *May 2024 - Aug 2024*
  - Developed a deep reinforcement learning-based framework for optimizing urban traffic flow through signal coordination using graph modeling. This project, sponsored by Bharat Electronics Ltd., is set for deployment in Chandigarh city, managing over 40 traffic signals.

- **S.S.B.I. Digital** — Remote
  Generative AI Intern (Full-time) — *April 2024 - Present*
  - Integrated open-weight LLMs and RAG techniques for advanced document processing and querying. Scaled the data ingestion pipeline to handle diverse document formats and increased the volume by 50x. Successfully delivered 10+ client applications to date.

- **PhysioAI.Care** — Remote
  Computer Vision Intern (Part-time) — *December 2023 - February 2024*
  - Developed a custom deep learning model for real-time posture monitoring using state-of-the-art pose estimation, and optimized APIs to reduce video stream and inference latency.

- **Jio Platforms Limited** — Remote
  R&D Intern (Full-time) — *June 2023 - August 2023*
  - Implemented skeletal rigging for 3D character animation, including automated bone placement on deformable meshes and the application of skinning algorithms for precise vertex weighting and mesh deformation.

- **Indian Institute of Technology** — Kharagpur, IN
  Research Intern (Full-time) — *May 2023 - June 2023*
  - Developed an end-to-end explainable AI system for identifying a person's native language from non-native speech patterns. This solution has been recognized by the NPTEL team and is slated for adoption on their platform.

EDUCATION

- **Pandit Deendayal Energy University** — Gandhinagar, IN
  Bachelor of Technology - Computer Engineering; CGPA: 9.75 — *2021 - Present*

PROJECTS

- **caRLa (Transfer Learning, Computer Vision, Deep Reinforcement Learning):** Leveraged pre-trained neural networks for feature extraction from dashboard camera feeds and applied deep reinforcement learning algorithms to autonomously drive a car in a simulation environment.

- **Obstacle Detection System (Computer Vision, Edge AI):** Developed a simple ROS-integrated program to identify multiple obstacles using YOLOv8 and estimate their depths using MiDAS. Deployed the program on NVIDIA Jetson NANO and developed ROS Subscriber around it.

- **Coloring GAN (Deep Learning, Computer Vision, Image Processing):** Developed a custom GAN architecture with a pretrained Res-U-Net backbone to efficiently colorize grayscale images with minimal training data. Reduced computational complexity by 33% through channel reduction transformations.

- **Selective In-Painting (Deep Learning, Computer Vision, Generative AI):** Developed a custom web application to perform image in-painting using Stable Diffusion on specific segments of the image achieved using SAM.

PUBLICATIONS & PATENTS

- **Conference Paper:** Explainable AI Driven Deep Learning for Accurate L1 Identification from L2 Speech. *Accepted at 28th International Symposium on Frontiers of Research in Speech and Music, 2024.*

- **Journal Paper:** PoseCor: Integrating Sustainable Development and Health Care 4.0 with Deep Learning for Real-Time Pose Detection and Correction. *Submitted to IEEE Access, under review.*

- **Provisional Product Patent:** Modular Device for Multi-Terrain Autonomous Driving for Unmanned Vehicles *Published. Application No: 202321038021*

- **Provisional Design Patent:** IoT-Based Intelligent Posture Monitoring System *Published. Application No: 202321037990*

SKILLS

- **Technical:** Python, C/C++, SQL, PyTorch, TensorFlow (Keras), FastAI, Flask, OpenCV, LangChain, Streamlit, Ollama
- **Soft Skills:** Executive Presentation, Project Management, Time Management, Public Speaking, Team Collaboration
- **Areas of Interest:** Data Science, Business Intelligence, Machine Learning, Deep Learning, Cloud Computing, MLOps

HONORS & AWARDS

- Top Machine Learning Voice (**top 3% profile**) on LinkedIn - April 2024
- Led the team in IRoC-U 2024 Rover Challenge by ISRO and secured a place in **top 148 teams**. - February 2024
- Received prototype development grant of **INR 225K** from Govt. of Gujarat. - November 2023
- Received cumulative prize money of **INR 150K** in RoboFest-3.0. - August 2023
- **Runner-up** in EnCode hackathon on Autonomous Driving Challenge sponsored by Bosch. - January 2023