

# SANJAY BHANDARI

Kathmandu, Nepal

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## Education

Institute of Engineering, Pulchowk Campus, Tribhuvan University

Oct 2018 – Mar 2023

Bachelor of Engineering in Computer Engineering

Lalitpur, Nepal

- Ranked **250<sup>th</sup>** in Entrance Exam 2075 BS out of nearly 18000 applicants.
- Graduated with **First Division**, achieving **79.38%**.

## Research Experience

NepAl Applied Mathematics and Informatics Institute

May 2023 – present

Research Assistant | Supervisor: Dr.Binod Bhattarai

Lalitpur, Nepal

- **Instance segmentation for Coronary Artery Segmentation and Stenosis Detection**
  - Achieved 2nd position in the ARCADE challenge at MICCAI 2023 despite utilizing robust Convnext-v2 and pseudolabelling to tackle limited data issue.
- **Out-of-Distribution (OOD) Detection in Gastrointestinal Images**
  - Developed a distance-based method for OOD detection in Gastrointestinal setting that utilizes distance information from both nearest and non-nearest clusters, outperforming state-of-the-art methods.
- **Test Time Augmentation for OOD Detection**
  - Created a plug-and-play test time augmentation-based OOD detection method, which significantly improved the performance of all previous OOD detection techniques.
- **Hallucination-Aware Gastrointestinal Multimodal Data Creation and Analysis with Large Vision Language Models**
  - Currently creating a comprehensive multimodal dataset based on the Kvasirv2 dataset to advance VLMs for GI analysis
  - Proposed a metric called GutHal, designed to effectively evaluate whether an LVLM generates hallucinated reports at a fine-grained level and addressing the hallucinations.

NepAl Applied Mathematics and Informatics Institute

Jun 2020 – Apr 2023

Research Intern | Supervisor: Dr.Binod Bhattarai

Lalitpur, Nepal

- Minor research activities involving literature review, data labeling, performing experiments, and assisting supervisors in brainstorming research ideas.

## Publications

- Bhandari, S. \*, Pokhrel, S. \*, Khanal, B. \*, ... Bhattarai, B., (2025). **Hallucination-Aware Multimodal Benchmark for Gastrointestinal Image Analysis with Large Vision-Language Models**. Medical Image Computing and Computer-Assisted Intervention 2025. [\[Paper\]](#)
- Bhandari, S. \*, Pokhrel, S. \*, Ali, S., ... Bhattarai, B., (2025). **NCDD: Nearest Centroid Distance Deficit for Out-Of-Distribution Detection in Gastrointestinal Vision**. Medical Image Understanding and Analysis 2025. [\[Paper\]](#)
- Bhandari, S. \*, Pokhrel, S. \*, Vazquez, E., ... Bhattarai, B., (2024). **Cross-Task Data Augmentation by Pseudo-label Generation for Region Based Coronary Artery Instance Segmentation**. Data Engineering in Medical Imaging, MICCAI 2024. [\[Paper\]](#)
- Bhandari, S. \*, Pokhrel, S. \*, Vazquez, E., ... Bhattarai, B., (2024). **TTA-OOD: Test-time Augmentation for Improving Out-of-Distribution Detection in Gastrointestinal Vision**. Data Engineering in Medical Imaging, MICCAI 2024. [\[Paper\]](#)
- Bhandari, S. \*, Pokhrel, S. \*, Vazquez, E., ... Bhattarai, B., (2023). **Convnextv2 fusion with mask R-CNN for automatic region based coronary artery stenosis detection for disease diagnosis**. arXiv preprint arXiv:2310.04749. [\[Paper\]](#)

## Professional Experience

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### Fogsphere (Redev AI Ltd), UK

Jan 2023 – present

*Computer Vision Engineer*

*Part time, Remote*

- Developed Climbing and Falling detection models for workplace safety through object detection and pose estimation.
- Testing and research optimization for use of ArcFace face recognition model.
- Tracking and Personal Protection Equipment Detection.

### Rara Labs, Nepal

Jan 2023 – Mar 2023

*Computer Vision Research Engineer*

*Remote*

- Worked in anomaly detection in public and private water sources, outlets and reservoirs.

## Projects

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### Stenosis Detection and Segmentation | *ARCADE 2023* [Github]

November 2023

- A research project focusing on detection and segmentation of stenosis in coronary arteries.
- Introduced the use of ConvnextV2 as backbone in Mask-RCNN pipeline.

### Video Upsampling of CCTV Footages | *Graduating Capstone Project* [PDF]

March 2023

- A research-guided Video Upsampling project for upsampling low quality CCTV videos.
- Implemented RD-BasicVSR model, derived from BasicVSR model for upsampling module.

### Sajha Aawaj | *Minor Capstone Project* [Github]

March 2022

- A Nepali Speech Recognition Project, also focused on Data Collection Portal for Nepali Speech.

## Teaching Experience

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### 4<sup>th</sup> Annual Nepal AI School (ANAIIS)

May 22 - June 1 2023

*Teaching Asistant*

*Certificate*

- Acted as Lead Instructor and Designed Lab Session on Active Learning and Data Augmentation under supervision of Binod Bhattarai, PhD.

### Locus 2022 AI Fellowship

*Instructor*

- Delivered lecture on AI fundamentals along with demonstration using python.

## Honors & Awards

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- Named researcher for 35,000 CHF grant on evaluation of Stenosis Detection in Nepal
- Runner up of MICCAI 2023 ARCADE challenge among 350 global participants
- Semester Excellence scholarship
- Semester-wise TU stipend for excellent academic performance

## Training & Certifications

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- Machine Learning and Convolution Neural Networks by Andrew NG (Coursera)
- Nepal Third Winter School in AI (NAAMII)
- Generative Adversarial Networks Specialization(Coursera)
- AWS Academy Graduate - AWS Academy Machine Learning Foundations, Cloud Foundations, Data Analytics

## Technical Skills

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**Languages:** Python, C++, Rust

**Technologies/Frameworks:** Pytorch, Scikit-learn, numpy, mmdetection, , matplotlib, Django

**Other tools:** Git, LaTeX, Shell Scripting, Docker, Linux Environment

## Extra-Curriculars

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### Event Organizer | *AI Hackathon & Hack-A-Week, Locus 2023*

- Organized a week-long hackathon **Hack-A-Week** and a two-day-long **AI Hackathon** as a part of LOCUS 2023.

### Football Player | *Pulchowk Campus*

- Winner of LOCUS 2020 Football competition.