

PRANAV POUDEL

Montréal, Québec, Canada

Education

Polytechnique Montréal

Ph.D. in Computer Engineering · 4.0/4.0 · Supervisor: Prof. Hervé Lombaert

Sep. 2025 – present

Montréal, Canada

IOE Pulchowk Campus, Tribhuvan University

*B.E. in Computer Engineering · First Division · 75.87%
Program duration extended by nationwide COVID-19 campus closures.*

Nov. 2017 – Mar. 2022

Lalitpur, Nepal

Awards and Scholarships

T.U. Free Scholarship

2018–2020

Merit-based award for the top 20 students by semester GPA, earned across 2nd, 4th, and 6th semesters, IOE Pulchowk Campus.

Annual Nepal AI School (AN AIS) Scholarship

2019

Full scholarship (registration and travel grants) to ANAIS — one of South Asia’s leading AI schools; awarded to the top 15% of participants by merit.

Fusemachines AI Scholarship

2019

First cohort recipient of program (Top 250 participants from 1000s of applications) for the Fusemachines AI Fellowship, a selective in-house AI training program.

F.F. STIP Scholarship

2017

Merit-based award for the top 10 students by semester GPA (1st semester), IOE Pulchowk Campus.

Entrance Rank 106/18000 (Top 0.5%)

2017

IOE national engineering entrance examination, Tribhuvan University.

Achievement Award, Mathematics

2017

Awarded to the highest scorer in the subject (98/100) in high school, Trinity International College.

Publications

Refereed Journal Articles (RAC)

[R1] Multimodal Federated Learning in Healthcare: A Review

Jacob Thrasher, Alina Devkota, Prasiddha Siwakotai, Rohit Chivukula, **Pranav Poudel**, Chaunbo Hu, Binod Bhattarai, Prashnna Gyawali

Journal of Healthcare Informatics Research, 2025 · Major Journal in Healthcare Informatics · IF: 4.6.

[R2] CholecTriplet2022: Show me a tool and tell me the triplet — An endoscopic vision challenge for surgical action triplet detection

Chinedu Innocent Nwoye, . . . , **Pranav Poudel**, Binod Bhattarai, . . . , Nicolas Padoy

Medical Image Analysis, 2023 · Top Journal in Medical Image Analysis · IF: 14.0.

Contributed as a top-10 performing team (ranked 5th) in the CholecTriplet2022 challenge.

Conference Proceedings (CAC)

[C1] Shape-guided Gaussian Splatting for Sparse-View X-ray 3D Reconstruction

Pranav Poudel, Florence Dell’Aniello Picard, Nairouz Shehata, Frédéric Lavoie, Herve Lombaert

Workshop on Continuous Representations and Grid-Free Methods in Medical Imaging, (MICCAI), 2026 ·

Oral Presentation.

[C2] Multimodal Federated Learning With Missing Modalities through Feature Imputation Network

Pranav Poudel, Aavash Chhetri, Prashnna Gyawali, Georgios Leontidis, Binod Bhattarai

Annual Conference in Medical Image Understanding and Analysis (MIUA), 2025 · Oral Presentation

[C3] CAR-MFL: Cross-Modal Augmentation by Retrieval for Multimodal Federated Learning with Missing Modalities

Pranav Poudel, Prashant Shrestha*, Sanskar Amagain*, Yash Raj Shrestha, Prashnna Gyawali, Binod Bhattarai

International Conference on Medical Image Computing & Computer Assisted Intervention (MICCAI), 2024 · Top Conference in Medical Image Analysis · Acceptance rate $\leq 30\%$

[C4] Task-Aware Active Learning for Endoscopic Polyp Segmentation

Pranav Poudel*, Shrawan Kumar Thapa*, Sudarshan Regmi, Binod Bhattarai, Danail Stoyanov

Workshop on Data Engineering in Medical Imaging (DEMI), MICCAI, 2024.

[C5] Neural Network Pruning for Real-Time Polyp Segmentation

Suman Sapkota, Pranav Poudel, Sudarshan Regmi, Bibek Panthi, Binod Bhattarai

Annual Conference in Medical Image Understanding and Analysis (MIUA), 2023.

* Equal contribution.

Other Achievements (AUT)

[AUT1] A Joint 2D–3D Statistical Shape Model for Orthopedic Reconstruction

Florence Dell’Aniello Picard, Pranav Poudel, Nairouz Shehata, Frédéric Lavoie, Herve Lombaert

Workshop on Shape in Medical Imaging, (MICCAI), 2026 · Under Review.

Research Experience

Multimodal Learning Lab, NAAMII/University of Aberdeen

July 2022 – Aug. 2025

Research Assistant (part-time) | Supervisor: Binod Bhattarai, PhD

Lalitpur, Nepal

- Designed a feature-imputation network for missing-modality federated learning, selected for oral presentation at MIUA 2025.
- Developed CAR-MFL, a retrieval-based augmentation method for missing modalities in multimodal federated learning; published at MICCAI 2024 ($\leq 30\%$ acceptance)
- Proposed a TaylorFO-based filter-pruning method enabling real-time polyp segmentation with minimal accuracy loss (MIUA 2023).
- Built a low-parameter graph-based multi-label classifier for surgical action-triplet recognition, ranking 5th in the MICCAI CholecTriplet challenge

NAAMII

Oct. 2021 – Mar. 2022

Research Intern | Supervisor: Binod Bhattarai, PhD

Lalitpur, Nepal

- Proposed a CoreSet + margin-based active learning approach that reduced annotation cost for endoscopic polyp segmentation (DEMI @ MICCAI 2024).

Industrial Experience

Fogsphere (Redev AI Ltd.)

Apr. 2022 – Aug. 2025

Computer Vision Engineer (contract)

Remote, UK

- Diagnosed hallucination in deployed VLM systems by analyzing cross-attention and response accuracy, informing model reliability.
- Reduced annotation cost for object-detection systems by designing an active learning pipeline (coreset + GMM) that prioritized high-value samples for labelling.
- Shipped two end-to-end computer vision systems: a vehicle-speed estimator, and an audio-video fusion model for CCTV electric-spark detection to prevent construction-site fire.

LIS Nepal Pvt. Ltd. — A Yomari Company	Oct. 2021 — Apr. 2022
<i>Software Engineering Intern, Machine Learning (part-time)</i>	<i>Lalitpur, Nepal</i>
Built and deployed a semantic-textual-similarity-based search engine that improved existing keyword-based search.	
ASMI Corporation	May 2019 — Mar. 2020
<i>Junior Researcher (part-time)</i>	<i>Remote, USA</i>
Researched automated in-video ad placement, developing methods to insert advertisements seamlessly into TikTok-style video content.	

Teaching Experience

Polytechnique Montréal	Fall 2026 (upcoming)
<i>Teaching Assistant — Shape Analysis in Medical Imaging</i>	<i>Montréal, Canada</i>
Selected by Prof. Hervé Lombaert to design and lead the laboratory sessions for the course.	
Annual Nepal AI School (AN AIS)	2021, 2023, 2024
<i>Teaching Assistant & Lab Instructor</i>	<i>NAAMII, Nepal</i>
- Teaching assistant for one of South Asia's leading AI schools, tutoring 200 participants of different backgrounds. - Designed and ran hands-on lab sections on Self-Supervised Learning (2024), Active Learning & Data Augmentation (2023), and Adversarial Learning (2021).	
Software Fellowship	2021
<i>Instructor</i>	<i>LOCUS, IOE Pulchowk Campus</i>
Delivered lectures on software testing and debugging, with live Python demonstrations of good engineering practice.	
Git Workshop	2019
<i>Instructor</i>	<i>IOE Pulchowk Campus</i>
Designed the syllabus and delivered a lecture on version control with Git.	

Social Involvement

Professional Service

Reviewer, <i>MICCAI</i> (Medical Image Computing & Computer Assisted Intervention)	2025, 2026
Reviewer, <i>DEMI Workshop</i> @ MICCAI	2024–2026
Reviewer, <i>OFFGRID Workshop</i> @ MICCAI	2026

Leadership & Community

Lead Organizer — Data Rush (National AI & Data Science Hackathon)	2021
<i>LOCUS, IOE Pulchowk Campus</i>	<i>Lalitpur, Nepal</i>
Led a nationwide hackathon promoting AI and data science; oversaw sponsorship, hackathon problem design, and participant management.	
Admissions Committee — Annual Nepal AI School (AN AIS)	2021
<i>NAAMII</i>	<i>Nepal</i>
Reviewed and selected full-fee-category participants for one of South Asia's leading AI schools.	
Logistics Manager — IEEE Student Branch	2021
<i>IOE Pulchowk Campus</i>	<i>Lalitpur, Nepal</i>
Managed logistics for invited talks and technical events.	
Campus Captain — Mozilla Campus Club	2018
Led the Pulchowk Campus chapter of Mozilla's global open-source student community	<i>Lalitpur, Nepal</i>
- Promoted open-source culture; organized Git/GitHub and KiCad circuit-fabrication workshops for first-year students. - Initiated a community-based open-source software for the campus.	