

Lavsén Dahal

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Durham, NC, USA

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EDUCATION

- Duke University** Durham, USA
Ph.D. in Electrical & Computer Engineering (CGPA 4.0/4.0) *Aug 2023 – Present*
Relevant Coursework: LLMs, Deep Learning & Machine Learning, NLP
- University of Girona** Girona, Spain
Erasmus+ M.S., Medical Imaging & Applications *Sep 2017 – Aug 2019*
- Visvesvaraya National Institute of Technology** Nagpur, India
B.Tech., Electrical & Electronics Engineering *Aug 2010 – Jun 2014*

PATENTS & INVENTIONS

- XCAT3 Computational Phantoms of Anatomy and Disease:** Filed *July 2025*, Duke University Office for Technology Transfer; framework for anatomically accurate computational models enabling advanced simulation and imaging research.
- XCAT3 Phantom Generation Pipeline:** Filed *July 2025*, Duke University Office for Technology Transfer; automated pipeline for scalable creation of synthetic phantoms, streamlining workflows and supporting large-scale validation studies.

SKILLS SUMMARY

- Languages:** Python, R, MATLAB, C++
- Deep Learning:** PyTorch, MONAI, TensorFlow, HuggingFace
- MLOps & Deployment:** Docker, Singularity
- Distributed Training:** PyTorch DDP, SLURM

EXPERIENCE

- Center for Virtual Imaging Trials, Duke University** Durham, USA
Research Assistant / Associate *Jun 2022 – Present*
 - Vision Language Model:** Aimed at localizing disease in a self-supervised or weakly labeled setting, leveraging multi-modal integration to enable robust detection with minimal manual annotation.
 - Segmentation Algorithm:** Increased number of anatomical structures segmented from full-body human scans by 40% via multi-modal fusion of complementary imaging inputs.
 - 3D Digital Twins:** Designed end-to-end pipeline generating 2,500+ anatomical 3D digital twin models (surface & voxel), powering large-scale synthetic imaging experiments available at <https://xcat-3.github.io>.
 - Research Supervision:** Mentored 5+ graduate students on diffusion models and Monte Carlo simulations, producing anatomically realistic datasets supporting advanced flow and motion analysis.
- Nepal Applied Mathematics and Informatics Institute for Research** Kathmandu, Nepal
Research Associate *Jul 2019 – Aug 2020*
 - Uncertainty Modeling:** Developed Monte Carlo Dropout framework for Bayesian uncertainty estimation in deep neural networks for segmentation, enabling automated filtering of low-confidence predictions.
 - Object Detection:** Built RCNN-based vertebrae detection system to automate Cobb angle measurements for scoliosis, reducing manual measurement time; results presented at MICCAI workshop.
 - AI Workshop Leadership:** Co-organized international AI workshop with 100+ participants; delivered sessions on generative models and advanced ML applications.
- VICOROB, University of Girona** Girona, Spain
Research Intern *Feb 2019 – Jun 2019*
 - Image Super-Resolution:** Developed deep learning-based super-resolution model for brain MRI surpassing conventional methods in PSNR and SSIM; gains validated via improved segmentation accuracy in downstream tasks.
- BioMedIA, Imperial College London** London, UK
Research Intern *Jul 2018 – Aug 2018*
 - Lung Cancer Classification:** Engineered deep learning model to distinguish benign vs malignant lung nodules using LUNA dataset.
- Kantipur Engineering College** Lalitpur, Nepal
Lecturer *Nov 2016 – Aug 2017*
 - Classroom Leadership:** Designed and taught Computer Programming & AI courses with real-world projects; improved student proficiency and project completion rates.
 - Undergraduate Mentorship:** Advised multiple senior theses from proposal to defense, guiding advanced algorithm implementation and research methods.
- JSW Steel** Maharashtra, India
Project Manager *May 2014 – Jun 2016*
 - Project Management:** Directed cross-functional teams delivering multi-million-dollar technical projects; oversaw strategic planning, procurement, and infrastructure upgrades with on-time, on-budget completion.

TEACHING EXPERIENCE

- **Duke University** Durham, USA
Teaching Assistant 2024-2025
 - **Natural Language Processing:** Graded assignments, and held office hours to support graduate-level NLP coursework.
 - **Machine Learning and Deep Learning:** Assisted in course delivery and held office hours, provided student mentorship, and graded projects in advanced ML/DL topics.

HONORS AND AWARDS

- **Ph.D. Fellowship – 2023:** \$500K+ full-ride scholarship awarded by Duke University.
- **Erasmus+ Global Scholar – 2017:** €42K full-ride scholarship awarded by European Union; 22 recipients globally.

PUBLICATIONS (SELECTED)

1. **Dahal, L.**, Bhandari, Y., Segars, P., & Lo, J. (2025). Five Models for Five Modalities: Open-Vocabulary Segmentation in Medical Imaging. In *CVPR 2025*.
2. **Dahal, L.**, Ghoghnejad, M., Vancoillie, L., Ghosh, D., et al. (2025). XCAT 3.0: A Comprehensive Library of Personalized Digital Twins Derived from CT Scans. *Medical Image Analysis*.
3. **Dahal, L.**, Wang, Y., Tushar, F.I., Montero, I., et al. (2023). Automatic Quality Control in Computed Tomography Volumes Segmentation Using a Small Set of XCAT as Reference Images. *Medical Imaging 2023*.
4. **Dahal, L.**, Kifle, A., & Khanal, B. (2020). Uncertainty Estimation in Deep 2D Echocardiography Segmentation. *arXiv preprint*.

Full publication list: [Google Scholar](#)