Uttkarsh Chaurasia

Ph.D. Researcher · Multimodal Machine Learning & Computer Vision

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Ph.D. researcher developing multimodal and unsupervised learning methods for medical imaging. Research spans clinical text processing, low-resource NLP, and graph neural networks.

EDUCATION

Washington University in St. Louis | St. Louis, MO

Ph.D., Imaging Science · Advisor: Abhinav K. Jha — Aug 2023 – Present · Expected Aug 2028

M.S., Electrical Engineering — Aug 2023 – Dec 2025

Selected coursework: Computer Vision; Bayesian Methods in Machine Learning; Large-Scale Optimization for Data Science; Probability and Stochastic Processes.

National Institute of Technology Hamirpur | India · Dual-degree pathway

M.Tech., Computer Science and Engineering — Aug 2021 – Jul 2023

B.Tech., Computer Science and Engineering — Aug 2018 – May 2022

RESEARCH EXPERIENCE

Graduate Research Assistant · Washington University in St. Louis — Aug 2023 – Present

Computational Medical Imaging and Therapy (CMIT) Lab · Advisor: Abhinav K. Jha

- Develop multimodal organ and tumor segmentation for Lu-177 SPECT/CT by combining CT anatomical priors, radiotracer uptake, and LLM-extracted clinical report information.
- Improved mean organ Dice from **0.73 to 0.80** versus direct CT-mask transfer using SPECT-space refinement; evaluated on **24 independent test patients** after development on 10 patients (2026 OIP study).
- Developed report-guided tumor localization with hidden Markov random field–expectation maximization (HMRF-EM), achieving mean tumor Dice of **0.43** on the independent test cohort.
- Develop TheraSeg, integrating segmentation, multiplanar visualization, quantification, and RTSTRUCT export; presented the research and software at the **2026 SNMMI Annual Meeting and AI Summit**.

International Summer Research Intern · Washington University in St. Louis — Jun – Jul 2022

- Developed unsupervised HMRF-EM segmentation of noisy SPECT images at CMIT Lab; evaluated Dice similarity and investigated Noise2Void denoising.

Deep Learning Researcher · LBR Research Labs — Sep 2021 – Apr 2022

- Compared TexTING, inductive GCN, and inductive GAT on **AG News, IMDB, and DBpedia**; GAT achieved 91.4%, 87.8%, and 98.1% accuracy, respectively. Co-authored the IEEE ASSIC 2022 paper.
- Implemented a graph-attention model for a separate hate-speech classification experiment, achieving **0.61 micro-F1**.

Undergraduate Research Assistant · NIT Hamirpur — May 2021 – Apr 2022

- Integrated unsupervised word sense disambiguation into statistical machine translation, improving English-to-Hindi by **2.30 BLEU points** (19.8 to 22.1); the study improved BLEU and METEOR across five English-to-Indic directions and was published in *IETE Journal of Research*.

Artificial Intelligence Intern · AICTE, Ministry of Education, India — Apr – Jul 2021

- Built a patent-similarity retrieval pipeline using TF-IDF, Word2Vec, and Doc2Vec text representations.

TECHNICAL SKILLS

Programming: Python, MATLAB; PyTorch, TensorFlow / TensorFlow Lite, NumPy, SciPy, scikit-learn.

Methods: Multimodal learning, unsupervised learning, LLM-assisted text processing, GNNs, CNNs, conditional GANs.

Imaging & tools: SPECT/CT, segmentation, registration, SimpleITK, TotalSegmentator, 3D Slicer, DICOM, Git.

Uttkarsh Chaurasia · uttkarsh@wustl.edu · Research & Technical Contributions

PUBLICATIONS

U. Chaurasia, A. Abu-Mahfouz, M. Rangbulla, K. Qi, R. Laforest, V. Prasad, A. K. Jha. "A Large-Language Model-Guided Unsupervised Segmentation Method for Lu-177 DOTATATE/PSMA SPECT/CT Images." *Journal of Nuclear Medicine*, 67(Suppl. 1):261107, 2026. **Conference abstract · First author.** SNMMI abstract

S. Saxena, **U. Chaurasia**, N. Bansal, P. Daniel. "Improved Unsupervised Statistical Machine Translation via Unsupervised Word Sense Disambiguation for a Low-Resource and Indic Languages." *IETE Journal of Research*, 69(12):8848–8858, 2023 (online 2022). **Journal article.** DOI: 10.1080/03772063.2022.2098189

U. Chaurasia, R. Dhenkawat, P. K. Verma, N. P. Singh. "COVID Prediction Using Different Modality of Medical Imaging." *Advances in Data-Driven Computing and Intelligent Systems*, Springer, pp. 201–213, 2023. **Book chapter · First author.** DOI: 10.1007/978-981-99-3250-4_15

V. Guleria, A. Verma, R. Dhenkawat, **U. Chaurasia**, N. P. Singh. "Brain Tumor Detection Using Texture-Based LBP Feature on MRI Images Using Feature Selection Technique." *Artificial Intelligence, Blockchain, Computing and Security*, Vol. 1, CRC Press, pp. 30–36, 2023. **Book chapter.** DOI: 10.1201/9781003393580-6

S. Pandian, **U. Chaurasia**, S. Ranjan, S. Saxena. "Comparative Study of Inductive Graph Neural Network Models for Text Classification." *IEEE ASSIC*, pp. 227–231, 2022. **Conference paper.** DOI: 10.1109/ASSIC55218.2022.10088315

SELECTED PROJECTS & ENTREPRENEURSHIP

Co-Founder & Chief Technology Officer · Oculosense EdgeAi Devices Sep 2021 – Aug 2023

- Co-founded an assistive technology company and led computer vision and hardware development; the team was selected among the **top 20 nationwide** for NSRCEL–Texas Instruments Launchpad support.
- Implemented **TensorFlow Lite / YOLOv4 object detection at 12 FPS** in the earlier Drishti navigation prototype for people with visual impairments (Mar 2020 – Jun 2021).

Class-Conditional Image Generation · M.Tech. Thesis, NIT Hamirpur Aug 2022 – Jun 2023

- Developed an auxiliary-classifier GAN for two-class, **64 × 64 image synthesis** from 228 original skin images, augmented to 3,192 variants; compared generator/discriminator learning rates across 80-epoch runs using generated samples and training losses.

Multilingual Conversational Agent · B.Tech. Team Capstone Jul 2021 – May 2022

- Integrated a Bi-LSTM sentiment model with rule-based dialogue, Telegram, and translation APIs in a four-person team; supported interaction through translation in **109 languages**, with Hindi and Punjabi demonstrations.

SELECTED HONORS & AWARDS

- **Winner, Great AI-Basic Cancer Research Shark Tank** · Siteman Cancer Center · **$25,000 lab research funding** for personalized treatment-planning methods · Jun 2026.
- **Best Poster**, Predictive Oncology/Computational Imaging Track · WashU Oncologic Imaging Program Annual Symposium · Mar 2025.
- **SNMMI Medical & Science Student Research Grant** · $5,000 · Mar 2024; **WashU Dean's Select Fellowship** · $5,000 · Aug 2023.
- **Google Hash Code 2022** · World rank **366 of 10,000+ teams** · Mar 2022.
- **Winner, India Innovation Challenge Design Contest 2019** · 18,000+ teams · Jun 2021; **National Winner, Smart India Hackathon 2020** · Hardware and innovation · Mar 2021.

TEACHING & LEADERSHIP

- **Teaching Assistant:** WashU, Mathematics of Image Science (Aug – Dec 2025) and Linear Algebra (Jun – Aug 2024); NIT Hamirpur, Digital Image Processing Laboratory (Aug – Dec 2022).
- **Community Outreach Officer, Association of Graduate Engineering Students, WashU** (Aug 2024 – Apr 2025): Led a ScienceCoach workshop with **8 graduate volunteers, 22 high-school students, and 4 teachers**.