

AJAY RAJENDRA KUMAR

Boston, MA | Availability: (September to December) 2025 (OR) (January to April) 2026

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EDUCATION

Northeastern University, Boston, MA

Sep 2024 - Present

Khoury College of Computer Sciences

Expected graduation: May 2026

Master of Science in [Computer Science](#)

GPA: 4.0 / 4.0

Related courses: *Programming Design Paradigms, Computer Vision, Deep Learning, Algorithms*

Manipal Institute of Technology, Manipal, India

Aug 2020 - Jul 2024

Bachelor of Technology in [Computer Science and Engineering](#) (Minor: *Computational Intelligence*)

GPA: 9.3 / 10.0

In top 5% of the department, recipient of *Scholar's Scholarship*

Achievements: *National 2nd Runner Up - DICV Hackathon* | *National Runner Up - AATM Hackathon*

Related courses: *Data Structures and Algorithms, Operating Systems, Software Testing and Analysis*

EXPERIENCE

Northeastern University, Boston, MA

Apr 2025 - Present

Research Assistant at [Visual Intelligence Lab](#)

Advisor - *Prof. Huaizu Jiang* & *Dr. Aruni RoyChowdhury*

- Conducting research in collaboration with [MathWorks](#) to develop a dynamics-aware visual SLAM pipeline using stereo image inputs. Focus on enhancing efficiency, robustness, and motion modeling for dynamic environments.

Northeastern University, Boston, MA

Feb 2025 - Present

Research Assistant at [D'Amore-McKim School of Business](#)

Advisors - *Prof. Anna Lamin* & *Prof. Valentina Marano*

- Developing a web scraping pipeline to efficiently collect and preprocess financial and CSR data of listed Indian companies from stock screening platforms, financial analysis sites, and government websites.
- Leveraging Large Language Models (LLMs) to analyze reported CSR activities, extract key insights on company strategies and their social impact, and explore operational improvements for more effective future CSR activities.

Indian Institute of Technology, Kharagpur, India

Jan 2024 - Jul 2024

DL Research Assistant at [School of Medical Science and Technology Lab \(SMST\)](#)

Advisor - *Prof. Subhamoy Mandal*

- Created three comprehensive datasets for biomedical semantic segmentation of Humerus bones from X-ray images.
- Trained and fine-tuned model with a U-Net backbone from the ground up, resulting in a Dice score of 0.97.
- Conducted noise tolerance testing of the implemented models and integrated attention and dilated convolutions to improve robustness towards noise. Residual Attention U-Net achieved a Dice score of 0.92 when trained using noisy X-ray images.

Fidelity Investments, Bengaluru, India

Jun 2023 - Aug 2023

Software Development Intern

- Revamped and streamlined change ticket management by rebuilding the frontend interface using Angular and backend architecture using SpringBoot and Oracle DB.
- Enhanced system performance and significantly sped up data retrieval efficiency by reducing delays from two hours to just a few seconds through the new standardized workflow.

Manipal Institute of Technology, Manipal, India

Feb 2023 - Sep 2023

NLP Research Assistant

Advisor - *Prof. Nisha P. Shetty*

- Trained and optimized traditional BERT and XLNet models for misinformation classification. Developed a cosine similarity-based algorithm to flag suspicious users within conversation clusters. The XLNet architecture achieved an F1 score of 0.93, outperforming BERT. [Publication](#) | [GitHub](#)

SELECTED PROJECTS

Improving Text-Driven Human Motion Generation through Equivariance

[Project Report](#)

- Improved on the architecture of the Motion Diffusion Model (MDM) by integrating equivariant neural networks to exploit symmetry in human motion. Mar 2025
- Achieved a 7% increase in matching accuracy and reported competitive FID scores against state-of-the-art baselines with minimal hyperparameter tuning. Awarded "Most Innovative Project" among 40+ projects in a PhD-level Deep Learning course.

Rethinking Depth for Object Detection with YOLOv3

[GitHub](#)

- Conducted a study analyzing the impact of depth data on object detection performance in the YOLOv3 architecture. Dec 2024
- Implemented YOLOv3 in PyTorch (37% mAP with RGB data) and a ResNet-based variant of YOLOv3 with RGB and depth data (35% mAP), highlighting YOLOv3's limitations in independently processing depth information.

SKILLS SUMMARY

Languages & Frameworks: Python, PyTorch, C/C++, Java, Weights & Biases SQL, R

Research Interests: 3D Scene Reconstruction, Visual Odometry, SLAM, Human Motion Generation, Image Segmentation

Distributed Systems & Infrastructure: SLURM, HPC clusters, Git