

# Prajnan Goswami

Boston, MA | (774) 433-9340 | [goswami.p@northeastern.edu](mailto:goswami.p@northeastern.edu) | [linkedin.com/in/prajnan/](https://linkedin.com/in/prajnan/)

## EDUCATION

### Northeastern University, Khoury College of Computer Sciences

Ph.D. in Computer Science | GPA: 4.0/4.0

Master of Science (Thesis) in Artificial Intelligence | GPA: 3.79/4.0

Boston, MA

Sep 2024 – Present

Jan 2021 – Dec 2022

### Sikkim Manipal Institute of Technology

Bachelor of Technology in Computer Science & Engineering | GPA: 8.69/10

Sikkim, India

July 2013 - May 2017

## RESEARCH AND WORK EXPERIENCE

### Khoury College of Computer Sciences, Northeastern University

Boston, USA

Research Assistant, Visual Intelligence Lab

Feb 2023 – Present

- Exploring a unified model for disparate visual correspondences.
  - Identified pre-trained vision transformers improve the accuracy of image-to-point cloud correspondences.
  - Analyzing the efficacy of various point cloud encoders for cross-domain feature matching.
  - Evaluating generalization and scalability with large-scale training with respect to model size and training data.
- Showed the effectiveness of Internal Learning using Single-Image Diffusion models for Super-Resolution, Image Inpainting and Texture synthesis (submitted to SIGGRAPH Asia, 2024).
- Identified limitations of 3D Gaussian Splatting for Dynamic Novel View Synthesis of single-view sports videos.

### Ford Motor Company

Palo Alto, USA

Computer Vision Research Intern

May 2022 – Aug 2022

- Implemented a novel Spatio-Temporal Feature Extractor that enabled Shared Features across multiple Perception tasks (applied for patent).
- Combined semantic segmentation, optical flow and action recognition for the downstream perception tasks.
- Implemented feature caching which reduced neural network memory footprint by removing multiple encoders.
- Experimented with various joint training recipes to stabilize the convergence of multiple downstream tasks.
- Implemented model performance and experiment tracking using TensorBoard and Data Version Control (DVC).
- Used Docker to train models on High Performance Computing (HPC) system.

### Dell Technologies

Bangalore, India

Software Engineer 2 / Software Engineer 1 / Software Development Intern

Jan 2017 – Dec 2020

- Automated root cause analysis of application failures resulting in 50% faster issue resolution by mapping application logs to a Bayesian Network using Python, Flask and D3js (US Patent: [US10860400B2](#)).
- Developed a GraphQL server to host client libraries (DLLs) enabling efficient rollback of legacy DLLs.
- Designed and built a Software as a Service (SaaS) application using .NET, Elastic Search, Redis and Docker that provides a Universal Template to easily configure microservice workflows.
- Implemented a Testing Framework using .NET and RabbitMQ enabling parity check between microservice and legacy behavior before directing live traffic through the new microservices.

## RESEARCH PROJECTS

### Motion Lens : Interpreting Text-Encoder's role in Text-to-Human Motion Models

Northeastern University

Structure and Interpretation of Deep Neural Networks (CS7180) | [[MotionLens](#)]

Nov 2024 – Dec 2024

- Identified the limitations of the Lens interpretability method and CLIP text encoder for generating human motion.
- Led and collaborated with a team of undergrad students on human motion generation research.

### Exploring Training Recipes and Transformer Neural Networks for Optical Flow

Northeastern University

Master's Thesis | [[GitHub Thesis](#)] | [[GitHub EzFlow, 100+ Stars, 10k+ Downloads](#)]

Sep 2021 – Dec 2022

- Demonstrated the importance of various training techniques on improving the results of Optical Flow models.
- Evaluated various Transformers and found Neighborhood Attention extracts better features for estimating Flow.
- Developed and published an open-source modular Neural Network library (EzFlow) for Optical Flow using PyTorch.

## SKILLS

**Languages and libraries:** Python, PyTorch, NumPy, OpenCV, Conda, Data Version Control(DVC), C++, etc.

**Computer Vision:** Feature Matching, Optical Flow, Point Cloud correspondences and registration, etc.

**Deep Learning:** ResNet, Transformer, Autoencoder, Internal Learning, Multitask Learning, Interpretable AI, etc.