

# Harshit Kumar

Boston, MA

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## Education

**Northeastern University**, Boston, MA

**Khoury College of Computer Sciences**

*MS Artificial Intelligence*

Sep 2022 - Present

GPA: 3.8/4.0

Courses: Intro to Programming for Data Science, Foundations of AI, Algorithms, Programming Design Paradigm, Machine Learning, AI for Human Computer Interaction, Pattern Recognition and Computer Vision, Large Language Models

**Guru Gobind Singh Indraprastha University**, Delhi, India

*BTech in Computer Science and Engineering, top-4 in class*

Aug 2016 - Sep 2020

GPA: 8.72/10.0

## Skills

**Programming/Markup Languages:** Python, C++, C, SQL, Java, R

**Machine Learning:** PyTorch, Tensorflow/Keras, OpenCV, scikit-learn, pandas, numpy, matplotlib, AWS SageMaker

**Tools & Frameworks:** Nvidia TensorRT, DeepStream, ONNX, MLFlow, Intel OpenVINO, Django, Flask, GStreamer

## Experience

**The Jackson Laboratory**, Bar Harbor, Maine

*Deep Learning Research Co-op*

Jul 2023 - Dec 2023

- Applied *Explainable AI* methods: Saliency Maps, Integrated Gradients on DNA sequence data using *PyTorch Captum*.
- Researched on model interpretability methods for the Graph Neural Networks such as GNNExplainer, GraphSVX.
- Generated benchmark synthetic datasets for graph classification tasks for biomedical networks using *PyTorch Geometric*.
- Embedded graph motifs into synthetic graphs, simulating real-world structural patterns found in biomedical networks.

**Khoury College of Computer Sciences**, Boston, MA

*Graduate Teaching Assistant*

Jan 2023 - Apr 2023

- Solved students' doubts for the course DS5010 Intro to Programming for Data Science under Prof Kylie Bemis.

**Vehant Technologies**, Noida, India

*Machine Learning Engineer*

Aug 2020 - Aug 2022

- Implemented 10+ *People and Traffic Analytics* solutions - line crossing, crowd estimation, abandoned object detection.
- Optimized end-to-end pipeline (GPU DL inference + CPU process) 1.5 times with *Mixed Precision, Quantization, Pruning*.
- Trained and deployed 8+ deep learning models using *PyTorch, Tensorflow, Nvidia TensorRT, DeepStream, Intel OpenVINO*.
- Mentored 2 fellow teammates and gave technical sessions on *Edge AI* topics w.r.t. Video Analytics for Smart Cities.

*R&D Intern*

Jun 2019 - Jul 2020

- Researched and fine-tuned models for 15+ multi-label Pedestrian Attribute Recognition i.e. clothing, age, gender, etc.
- Applied monocular depth estimation methods for under-vehicle object detection with 90% accuracy.

**Arbunize Digital Media Pvt Ltd**, Delhi, India

*AI (NLP) Intern*

Jun 2018 - Aug 2018

- Adapted Satz sentence boundary detection using *decision trees* and *neural networks* reducing errors by 1/3.
- Extracted skills from resume and worked on classification models with 0.89 F1-score to predict job title.

## Projects

**Image colorization of historical paintings using deep learning** [\[github\]](#)

Feb 2023 - Apr 2023

- Leveraged U-Net and pix2pix Convolutional Generative Adversarial Network, to colorize grayscale historical paintings.
- Utilizing CIELAB color space conversion and Patch discriminator for enhanced image-to-image translation.

**Pothole detection and segmentation** [\[github\]](#)

Jan 2020 - Jun 2020

- Devised custom Mask R-CNN and YOLACT models for pothole segmentation on Indian roads with 25fps speed.
- Attained 86% accuracy, 0.30 mAP on custom testing dataset with PyTorch.

## Events & Achievements

- **Conferences:** Computer Vision Summit'23, 22, NVIDIA GTC'22, GTC'21, GTC'20, PyData'22, Google Cloud Summit'18.
- **Hackathons:** Smart India Hackathon'18 finalist, Rajasthan Hackathon 5.0, Rajasthan Hackathon 4.0.
- Received PyTorch Scholarship (**Deep Learning Nanodegree**) and Bertelsmann Scholarship (**Data Analyst Nanodegree**) by being in **top 3% out of 10k** applicants.
- **Top-15 answerer** of all time on Stack Overflow in PyTorch category (**10th** to earn **PyTorch Silver badge**).
- Received Vehant Technologies' **Summer 2021 quarterly award** for best problem solving ability.