Harshit Kumar

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Education

Northeastern University, Boston, MA — *Sep 2022 - Present*
Khoury College of Computer Sciences
MS Artificial Intelligence — *GPA:* 3.8/4.0
Courses: DS5010 Intro to Programming for Data Science, CS5100 Foundations of AI, CS5800 Algorithms, CS5010 Programming Design Paradigm, CS6140 Machine Learning, CS5170 AI for Human Computer Interaction

Guru Gobind Singh Indraprastha University, Delhi, India — *Aug 2016 - Sep 2020*
BTech in Computer Science and Engineering, top-4 in class — *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
Tools & Frameworks: Django, Flask, PostgreSQL, AWS SageMaker, Nvidia TensorRT, DeepStream, MLFlow, OpenVINO

Experience

The Jackson Laboratory, Bar Harbor, Maine — *Jul 2023 - Dec 2023*
Deep Learning Researcher (Fall Co-op)
- 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.
- Embedded graph motifs into synthetic graphs, simulating real-world structural patterns found in biomedical networks.

Khoury College of Computer Sciences, Boston, MA — *Jan 2023 - Apr 2023*
Graduate Teaching Assistant
- Solved students' doubts for the course DS5010 Intro to Programming for Data Science under Prof Kylie Bemis.

Vehant Technologies, Noida, India — *Aug 2020 - Aug 2022*
Machine Learning Engineer
- 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* and *Quantization*.
- 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 — *Jun 2018 - Aug 2018*
AI (NLP) Intern
- 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

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.

Face Generation using DCGAN [github] — *Feb 2019 - Mar 2019*
- Implemented and trained Deep Convolutional Generative Adversarial Network on 200k images to generate faces.
- Achieved generator loss of 0.7 and discriminator loss of 1.8 to generate almost-real faces.

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.