

# Abhinav Gupta

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## Education

- New York University** New York, NY  
Masters in Computer Science (**GPA: 3.97/4.00**) Jan 2021 - Dec 2022  
Relevant Coursework: Natural Language Processing and Understanding, GPU, Deep Learning, MultiCore Processors
- Indian Institute of Technology Guwahati** Guwahati, India  
Bachelors in Mathematics and Computing (**GPA: 8.06/10.00**) July 2015 - June 2019  
Relevant Coursework: Linear Algebra, Parallel Computing, Databases, Machine Learning, Probability, Calculus, Statistics

## Experience

- New York University** New York, NY  
Research Assistant | Multimodal Deep Learning | [Prof. Narges Razavian](#) - NYU Langone Health July 2022 - Present
  - Building a GPT style [open-source](#) benchmark for Electronic Health Records (EHR).
  - Skills: Healthcare, Multimodal DL, Benchmarking Tasks and Dataset, Huggingface
- Samsung Electronics** Bangalore, India  
Senior Software Engineer | 5G Mobile Communication Systems June 2019 - July 2021
  - Architected and automated the issue management pipeline for 5G Systems team which saved around 1 hour of daily repetitive work per team engineer.
  - Developed sensor beam management driver code for proper 5G network beam selection.
  - Optimized and ported in-house multi-core Real-Time Operating System (RTOS) for Samsung LSI 5G modems.
  - Implemented MediaTek chipset's Mobile Broadband Interface Model (MBIM) extension for Samsung.
- R&D Summer Intern | Advanced Technology Labs May 2018 - July 2018
  - 3-D handwriting recognition with a wearable input system i.e. Samsung Gear Watch.

## Projects

- ML & Privacy in Healthcare:** Studying the impact of pre-training and fine-tuning a multi-modal (chest radiograph images + clinical text reports) architecture in a [federated learning](#) setup and comparing against training it in centralized setting.
- Domain Adaptation of Pre-trained Language Models - NLP:** [Explored domain adaptation](#) and few-shot learning capabilities of semi-large PLMs like GPT-2 and CTRL, to improve performance on low resource downstream tasks without having to deal with large computation power needs. (Supervisor: [Prof. Sam Bowman](#))
- Semi-Supervised Learning for Object Detection - Computer Vision:** Competed and finished in first position on object detection task leaderboard. We employed a combination of several self-supervised models and object detector heads and concluded that Barlow Twins + Deformable DETR performed the best. (Supervisor: [Prof. Yann LeCun](#))
- Relation Extraction Survey - NLP:** Analyzed and implemented several Deep Learning methods to recognize drug-drug interactions (relation extraction) that appear in clinical texts like DrugBank and MEDLINE.
- Generative Adversarial Network:** Transferring the pose of a given person to a target pose using a GAN network.
- Toy Language Interpreter:** Built a python based toy language [interpreter](#) using regex and various OOPS features which could efficiently handle nested loops, basic function calls and several other compound statements.
- Operating System Extensions:** Built a prototype linker and scheduler to replicate general OS functionalities. Also implemented a basic [linux shell](#) from scratch in C programming language which could efficiently handle job control and pipelining.
- Database modelling of Twitter Dataset - NoSQL:** Implemented an efficient [database model](#) in Cassandra and Neo4j to execute queries on twitter dataset using Python.

## Skills and Leadership Experiences

**Programming Languages** C, C++, Python, Java \*, R, Bash, JavaScript \*

**ML/DL/CV Frameworks** PyTorch, Hydra, Tensorflow, OpenCV \*

**Miscellaneous** MySQL, NoSQL, CUDA \*, OpenMP \*, MPI \*, Git, Matlab, HTML, CSS

\* Elementary Proficiency

- Graduate Teaching Assistant (NYU):** Natural Language Processing, Numerical Computing, and Algorithmic Problem Solving
- Placement Coordinator 2017-19:** Worked as a member of the Centre for Career Development, IIT Guwahati to plan and coordinate full-time Jobs and Internships of around 1000 students across 11 departments.