Abhilasha Lodha

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EDUCATION

University of Massachusetts Amherst　　　　　　　　　　　　　　　　　　　**Sep 2022 - May 2024**
MS in Computer Science (Data Science Concentration) | GPA: 4.0/4.0　　　　　　　*Amherst, MA*
Delhi Technological University　　　　　　　　　　　　　　　　　　　　　**Aug 2014 - May 2018**
B.Tech in Electrical & Electronics Engineering | GPA: 8.99/10 | Department Rank 3 out of 110　　*Delhi, India*

WORK EXPERIENCE

Ericsson, *Data Science Intern*　　　　　　　　　　　　　　　　　　　　**Jun 2023 - Dec 2023**
Machine Learning Department *- NLP, Computer Vision & Generative AI*　　　　　　*Plano, Texas*
- Devised a solution for telecom question-image mapping, utilizing **MLOps** practices to reduce manual effort of SMEs by ∼80% [CLIP, BLIP, LORA, Azure Custom Vision API]
- Employed **advanced multimodal models** for Visual Question Answering (VQA) using techniques like few-shot learning and Retrieval-Augmented Generation (RAG) [GLIP, CM3leon, Instruction Tuning, Prompt Engineering]

Microsoft AI, *Graduate Research Assistant*　　　　　　　　　　　　　　　**Feb 2023 - Jun 2023**
MAIDAP *- NLP & Interpretable AI*　　　　　　　　　　　　　　　　　*Cambridge, Massachusetts*
- Built **Parameter Efficient Fine-Tuning (PEFT)** strategies for 3 language encoders, utilizing Fisher matrix to identify optimal layers for fine-tuning, incorporating semantic understanding into the models [BERT, RoBERTa, XLNet]
- Conducted fine-tuning experiments & compared accuracies between full-model & the identified **top & bottom 1-5 layers** from Fisher scores [GLUE, SuperGLUE]

EXL Digital R&D, *Senior AI Developer*　　　　　　　　　　　　　　　　**Jul 2021 - Jul 2022**
Xtracto.AI *- Computer Vision & NLP Asset*　　　　　　　　　　　　　　　*Gurgaon, India*
- Automated an end-to-end pipeline to **increase efficiency** of processing financial statements by ∼**93%**. Implemented borderless & bordered table detection, information extraction & table classification [FasterRCNN, Tesseract OCR, Naive Bayes, AWS Textract]
- Created a solution in a multi-threaded environment to extract & map 10+ data points from Spanish & English invoices, achieving a **response time of ∼3 sec per invoice** [AWS Textract, AWS Translate APIs]

Accenture AI, *Advanced Application Engineering Analyst*　　　　　　　　　　**Sep 2018 - Jun 2021**
Image Analytics Service Platform *- Computer Vision Asset*　　　　　　　　　　*Gurgaon, India*
- Designed a geospatial image analytics system to pre-process Landsat8 images, compute satellite indices (NDVI, NDWI, NDBI) & predict up to 5 classes with an **IoU score of 93%** [UNET algorithm, Pansharpening]
- Built & deployed a Covid-19 safety management system across **45 Accenture India facilities** for mask detection, social distancing violation detection & temperature measurement on 20,000 camera feeds [Yolo V5, Caffe2, Flir Image Extractor]

MyWizard IngrAIn Platform *- Machine Learning & NLP Asset*
- Optimized a predictive model with an **AUC score of 94.41%** for a Fortune 500 client to forecast & monitor customers at risk of default payments [Regression, Decision Tree, Random Forest, XGBoost]
- Engineered an abstractive text summarization system to condense critical information from lengthy emails into conceptual summaries with a **ROUGE-2 score of 89%** [BART, GPT, T5 Transformers]

LEADERSHIP EXPERIENCE

- Found **own tech start-up "Design Dockyard"** effectuating 50+ international projects in graphic & UI/UX design
- Won **1st** position across **18 countries & 531 teams** in Accenture Global Artificial Intelligence Hackathon

PUBLICATIONS

"On Surgical Fine-Tuning for Language Encoders" [LINK]　　　　　　　　　　　　**EMNLP'23**
- Devised selective fine-tuning using **Fisher matrix** to optimize performance of Large Language Models (LLMs)

"Understanding Code Semantics: An Evaluation of Transformer Models in Summarization" [LINK]　　**EMNLP'23**
- Assessed Large Language Models' (LLMs) code summarization capability with semantic preserving **code transformations**

"Floor Space Optimization and Recommendation System in 2D Space" [LINK]　　　　　　**CCVPR'21**
- Developed a solution for optimizing empty floor space in balcony garden design recommendations with **IoU score of 96.4%**

"Borderless Table Detection and Extraction in Scanned Documents" [LINK]　　　　　　**CCVPR'21**
- Designed a pipeline for bordered & borderless table detection & data extraction with an **accuracy of 98.4%**

PROJECTS

- Implemented a chatbot-based system for **intent classification & entity extraction**, streamlining performance monitoring & workload management for a large team of 100 engineers & MLE [Conversational AI, Rasa, TF-IDF, GloVe, Word2Vec, spaCy]
- Optimized a visual search & recommendation system with a **cosine similarity of 92%** to generate 5 similar apparel images from 1 input image using Amazon Fashion dataset [ResNet, Attention GANs, MXNet, KNN, Diffusion model]

SKILLS

Languages: Python, C/C++, Java, R, SQL, HTML, CSS, Javascript, Flask, Linux, Docker, Spark, MapReduce, Hadoop, RESTful
ML Frameworks: TensorFlow, Keras, PyTorch, OpenCV, Scikit-Learn, NLTK, Numpy, Pandas, Spacy, LLMs, Airflow, Databricks
Databases & Analytics Tools: MongoDB, MySQL, PostgreSQL, Snowflake, Tableau, Grafana, Kibana, Splunk, Power BI
Others: AWS (Lambda, EC2, S3, Sagemaker, Kinesis), GCP, Azure, Version Control (Git), CI/CD, Kubernetes, ElasticSearch, Jira