Rohan Chaudhury

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Objective

Possessing an exceptional research background in Machine Learning and Artificial Intelligence, I am a consummate Software Engineer with over three years of experience and a proven track record of exceeding expectations in developing and managing scalable production systems. My unwavering commitment to excellence positions me as an ideal candidate for ML/Software Engineering and Data Science roles, where I aspire to make a lasting, positive impact on the organizations I serve and contribute meaningfully to the advancement of the industry.

Education

Texas A&M University, College Station, Texas　　　　　　　　　**August 2021 – December 2023**
Master of Science in Computer Science, with Graduate Scholarship　　　　　　　　GPA: 4.0/4.0
Courses: Machine Learning, Software Engineering, Pattern Recognition, Deep Learning, Natural Language Processing, Analysis of Algorithms, Operating Systems, Data Mining, Object Oriented Programming, Parallel Computing

National Institute of Technology (NIT) Durgapur, India　　　　　　**August 2015 – May 2019**
Bachelor of Technology in Electronics and Communication Engineering　　　　　Cumulative GPA: 9.25/10

Work Experience

Soft Interaction Lab | *Graduate Research Assistant*　　　　**Mar – May 2022 & Aug 2022 – Present**
Dept. of Visualization | *Python, C#, Tensorflow, PyTorch, Hugging Face, Unity*　　Texas A&M University, College Station
- Spearheaded the development of a Conversational Artificial Intelligence VR & application to serve as a virtual patient for TAMU School of Nursing students, replacing manual training methods. Adopted and highly acclaimed by the school.
- Developed a conversational AI-driven interview training VR & Web application utilizing a refined gpt-3.5-turbo model, capable of resume analysis, context retention in custom built memory components, and personalized questioning.

TAMU InfoLab | *Graduate Thesis Student*　　　　　　　　　　**Aug 2022 – Present**
Dept. of Computer Science & Engineering | *Python, Tensorflow, PyTorch*　　Texas A&M University, College Station
- Conducting research on harnessing Dense Passage Retrieval, Retrieval Augmented Generation, & LLMs to advance question-answering performance on Multidoc2dial & Wizards of Wiki datasets under Prof. James Caverlee's guidance.
- Researching enhanced disfluency detection and removal with lightweight large language models (T5-base).

Amazon.com, Inc. | *Software Development Engineer Intern*　　　　**May 2022 – August 2022**
Java, JavaScript, TypeScript, AWS - Lambda, DynamoDB, Athena, S3, EC2, VPC, CDK, IAM　　Seattle, Washington
- Developed a full-stack software that procures run-time customer-data consumption details of internal services and analyzes it to show the data consumption statistics and access limitations for the individual services in a dashboard
- Enabled service owners to get a better perspective of the data utilization details, access limitations, and possible security breaches all in one place (with the help of this software), thereby saving 90% manual effort in finding them.

Qualcomm Technologies, Inc. | *Associate Software Engineer*　　　　**Nov 2019 – Aug 2021**
Artificial Intelligence Software Team | *SNPE, AIMET, Tensorflow, PyTorch, Hugging Face, ONNX*　　Hyderabad, India
- Optimized several trained Neural Network models (of Samsung, OnePlus, and other OEM customers) utilizing model compression, quantization and fine-tuning techniques, to run the models efficiently on DSP cores of Snapdragon chipsets
- Implemented critical feature requests in Snapdragon Neural Processing Engine SDK to enhance its functionalities
- Developed a new Recommendation System to give suggestions of similar Salesforce issues raised by customers in the past for newly raised customer issues, with a reported accuracy of 74% across various engineering divisions of Qualcomm
- Developed a widely used (more than 1000 internal users/month) Automation Software to automatically download (Selenium), intelligently parse, & generate error logs & reports from device crash dumps sent by customers in Salesforce
- Fixed critical Docker, bokeh server, and documentation bugs in AIMET (Artificial Intelligence Model Efficiency Toolkit)

PricewaterhouseCoopers (PwC) Pvt. Ltd. | *Technology Consultant Intern*　　**May 2018 – July 2018**
SAP Team | *SAP Cloud Platform, SAP HANA Cockpit, RASA, Dialogflow*　　Kolkata, West Bengal, India
- Developed an AI ChatBot using Google Dialogflow and SAP (Systems, Applications & Products in Data Processing) Cloud Platform to send and receive, query and data, to and from the SAP cloud database in real-time. Documentation
- It allowed the engineers to easily and efficiently query and populate data into the database thereby saving 70% of their manual labor

Academic and Personal Projects

Academic Projects | *Python, PyTorch, Tensorflow, Numpy, Pandas, Javascript, HTML* **2021 − 2023**
- Built a web application by using few-shot learning on gpt-3.5-turbo to generate and post new blogs every hour Website
- Outperformed the baseline model in SemEval 2023 Task-6 for classifying Legal Documents based on their rhetorical roles by modifying baseline model with T5-large tokenizer and encoder & achieved an accuracy of 81.6% Github
- Developed Hierarchical Attention Network for Sentiment Analysis as described in the paper Hierarchical attention networks for document classification and achieved an accuracy of 86.25% using BERT embeddings as input Github
- Utilized GPT-2 text generations capabilities for sentiment analysis (on IMDB dataset) using both few-shot learning and fine-tuning. Obtained an accuracy of 90%. Visualized attention outputs to gain insights and improve accuracy. Github
- Designed an Adaboost classifier for face detection using Viola Jones algorithm with 97% accuracy. Medium article, Code
- Utilized (1) bayesian optimization for hyper-parameter tuning to train a custom Convolutional neural network and (2) fine-tuning of pre-trained ResNet50 and MobileNetV2 models for Facial Expression Recognition (ICML 2013). Code
- Estimated public speaking anxiety from VerBio dataset using (1) FNN trained with (a) features modified using filter and wrapper category selection methods and Principal Component Analysis, (2) RNN, GRU, LSTM networks. Poster, Code
- Implemented efficient collaborative filtering and SVD++ matrix factorization as described in Korens� 2008 paper "Factorization meets the neighborhood: a multifaceted collaborative filtering model". Colab, Github
- Discovered and plotted interesting associations by analyzing US congress tweets dataset using word2vec, hugging face models, t-SNE, PCA, and k-means. Colab, Github
- Designed the Apriori algorithm and used it to find frequent itemsets and association rules in the movielens dataset Code
- Trained decision tree, random forest, Adaboost regressor models to predict hiring chances based on job interviews. Code
- Applied PageRank algorithm and performed exploratory data analysis using PySpark and graphframes on us-congress-tweets dataset. Code
- Implemented a K-Nearest Neighbour classifier for cancer death risk prediction using Haberman's Survival Dataset. Code
- Conducted a study of various aspects of the operating systems designed for the Internet of Things (IoT) devices. Paper
- Utilized K-means and Gaussian Mixture Models for clustering countries based on their longitude and latitude. Code
- Implemented a solution to the multiple Producer-Consumer Problem in C without using any shared memory. Github
- FIFO, LRU, Second-chance page replacement algorithm implementations in C. Github
- Designed a linear regression model from scratch for the prediction of outcomes in a game setting. Code
- Implemented and enhanced javascript and html content of animations and games in Texas A&M vetmed website. Video
- FCFS, SCAN, and C-SCAN disk scheduling algorithm implementation in C. Github
- A wrapper implementation for the Stat command-line program in C. Github

Personal Projects | *Python, OpenAI Universe, Android Studio, Unity, C++, Tensorflow, Selenium* **2017 − 2020**
- Fabricated Reinforcement Learning (RL) tutorial series to demonstrate the steps to make an AI game Bot using RL
- Developed RFID card based authentication system project using Raspberry Pi, Github Link, Explanation video
- Created an Augmented Reality-based Android Application in Unity that can render any video over any surface on screen
- Developed an AI Chatbot Android Application using Android Studio and Google Dialogflow, Github link
- Developed Smart Travel Route Finder application in C++ using Dijkstra's algorithm to get optimal route between cities
- Trained a Sentiment Analysis model using Tensorflow to analyze positive/negative sentiments in reviews, Github Link
- Developed a demo web scraping pipeline using Python and Selenium library for Dataset Collection, Github Link

Autonomous Robot Navigation using Computer Vision | *Python, Lasagne, Theano, Raspberry Pi* **2017 − 2018**
- Worked on Autonomous robot navigation and real-time obstacle avoidance strategies to reach a target in a known environment using a trained Convolutional Neural Network and Raspberry Pi under guidance of Prof. Nirmal Hui

Robot Path Planning Simulation in Static Environments | *Python, Tkinter* **2017 − 2017**
- Developed a Robot Path Planning simulation using Potential Field Method under guidance of Prof. Amit Konar

Image restoration using Morphological Transformation Techniques in IP | *Python, OpenCV* **2017 − 2017**
- Conducted image restoration of noisy images of old Palm Leaf Manuscripts and old paintings using Morphological Transformation Techniques in Image Processing under guidance of Prof. Bhabatosh Chanda

Publications & Presentations

- Seo, J.H., **Chaudhury, R.**, Oh, J.H., Kicklighter, C., Arguello, T., Wells-Beede, E. and Weston, C., 2023, June. Development of Virtual Reality SBIRT Skill Training with Conversational AI in Nursing Education. In International Conference on Artificial Intelligence in Education (pp. 701-707). Cham: Springer Nature Switzerland.
    - Presented the paper virtually at the International Conference on Artificial Intelligence in Education 2023, Tokyo, Japan.

- Garcia, B., **Chaudhury, R.**, Versaw, M., Back, J., Kwon, D., Kicklighter, Caleb., Taele, Paul., Seo, J.H., 2023, August. AllyChat: Developing a VR Conversational AI Agent Using Few-Shot Learning to Support Individuals with Intellectual Disabilities Accepted In Human-Computer Interaction - INTERACT 2023 - 19th IFIP TC 13 International Conference, York, UK August 28 - September 1, 2023
    - Will present the paper virtually at the INTERACT 2023 conference, York, UK.

- Mahata, S., **Chaudhury, R.**, Kar, R., Mandal, D. and Saha, S., 2018, July. Optimal Integer Order Approximation of Fractional Order Human Ear Simulator. In 2018 15th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON) (pp. 660-663). IEEE.
    - Conducted an in-person presentation of the research paper at the ECTI-CON 2018 conference, in Chiang Rai, Thailand.

Technical Skills

Languages:	Python, Golang, Java, C++, C, TypeScript, JavaScript, SQL, Ruby, C#, R, Bash, HTML/CSS, XML, NoSQL
Libraries:	Tensorflow, PyTorch, PySpark, Caffe, Keras, Scikit-learn, OpenCV, ONNX, Pandas, Numpy, Selenium, Regex
Cloud skills:	Amazon Web Services Lambda, Dynamodb, Cloud Development Kit, S3, CloudFormation, EC2, VPC, IAM, Athena, CloudAuth, EventBridge, SAP HANA Cockpit, Google Cloud Platform, Azure, IBM Watson
Toolkits:	Hugging Face, OpenAI, Artificial Intelligence Model Efficiency Toolkit, Snapdragon Neural Processing Engine SDK
AI & Others:	Dense Passage Retrieval, Retrieval Augmented Generation, Blog Writer (Medium), Dagger Framework, Spring Framework, MVC, Linux, Git, MATLAB, Jupyter Notebook, JIRA, Docker, Salesforce, Heroku

Awards & Achievements

1. Awarded funding from the Academy of Visual and Performing Arts (AVPA) of Texas A&M University to present my research paper at the 24th International Conference on Artificial Intelligence in Education, AIED 2023.
2. Received Scholarship of $10,205/year for 2 years in a row from the Department of Computer Science and Engineering of Texas A&M University, College Station
3. Earned multiple Professional Excellence Awards at Qualcomm for independently developing two pivotal Natural Language Processing and automation-based software, and for enriching the Artificial Intelligence Model Efficiency toolkit (AIMET) through significant open-source contributions, all while exceeding the scope of my core responsibilities.

Trainings & Certifications

2023	Data Parallelism: How to Train Deep Learning Models on Multiple GPUs	NVIDIA Deep Learning Institute
2018	Machine Learning, Online course authorized by Stanford University	Coursera
2018	Neural Networks and Deep Learning, Course authorized by deeplearning.ai	Coursera
2018	MIT RES.6-012 Introduction to Probability, Spring 2018, Completed the online lecture series	Youtube
2018	Applied AI with Deep Learning,Course authorized by IBM, Badge Link	Coursera
2018	Google Cloud Platform Big Data and Machine Learning Fundamentals	Coursera
2016	Summer training on Embedded Systems and Microcontrollers	Pracsol Technologies

Leadership, Extracurricular Activities & Positions of Responsibility

ROBO-CELL of Centre for Cognitive Activities   **2015 − 2019**
Technology Head   Official Robotics club of NIT Durgapur, India
- Conducted several technical workshops and taught more than 300 students over a span of 4 years about programming and machine learning
- Provided hands-on experience to more than 300 students on how to make various manual and autonomous robots using Raspberry Pi and Arduino. Video links of obstacle-avoiding robots made by the workshop students: Link 1, Link 2

Aarohan, Annual Techno-Management Fest of NIT Durgapur   **2017 − 2019**
Executive Fest Coordinator   NIT Durgapur, India
- Organized and led a team of around 100 students for conducting 3 grand technical fests, various events, and workshops

Child Care Project of CCWH and RI   **2008**
- Raised funds for the project to help children suffering from cancer: The Certificate Link

Indira Kala Sangit Viswavidyalaya   **2000 − 2011**
Attended 11 years of formal art course: Marksheet Link, Certificate Link   West Bengal, India
- Provided introductory lessons on Art to more than 50 interested students in school and college
- Won several painting competitions during school days