Rachna Ramesh

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Education

Master of Science in Data Science & Artificial Intelligence **2023 – 2025***
Eindhoven University of Technology (TU/e) *Eindhoven, The Netherlands*

Bachelor of Technology in Computer Science and Engineering **2014 – 2018**
University of Kerala, ***CGPA: 8.51/10*** *Trivandrum, India*
Thesis*: Handwritten mathematical Expression Recognition and Evaluation*

Relevant Coursework

Research Topics in Data Mining, Foundations of Artificial Intelligence, Neural Networks, Graph Theory, Process Mining, Visualization

Experience

AI Engineer **Aug 2019 – July 2023**
Emerging Technologies, R.R Donnelley (RRD) *Chennai, India*

- Utilized Deep Learning techniques and leveraged software engineering principles to conceptualize, design, and implement innovative solutions.
- Developed Proof of Concepts (PoCs) and Minimum Viable Products (MVPs), in a dynamic team environment, blending theoretical knowledge with hands-on expertise for tangible outcomes.

Machine Learning and Data Analytics Intern **Dec 2018 – May 2019**
QuEST Global *Trivandrum, India*

- Worked independently to extract insights from building operational data.
- Investigated various machine learning (regression) algorithms and concepts of neural networks (RNN) to predict electricity bills and suggestions for improving the efficiency of various systems.

Software Development Intern **Jul 2018 – Aug 2018**
UST Global *Trivandrum, India*

- Contributed to creating a Unified Test Execution Platform at UST's innovation garage, 'Infinity Labs'.
- Created RESTful Web Services using `Java` (`Spring` framework) and `SQL`.

Software Development Engineer Intern **May 2017 – Aug 2017**
Tata Consultancy Services (TCS) | Code *Cochin, India*

- Automated cab allocation and car-pooling for employees, based on their route and destination.
- Streamlined travel expenditure reduction by 50% and automated 90% of cab coordination.

Selected Work Projects

Document Layout Analysis | *Python*

- Enhanced automation efficiency, increasing the automation percentage of the manual remediation process to 65%, and then to over 78%, by creating a production grade tool currently being used across the organization.
- Researched and implemented LayoutMv3, specializing in multimodal document analysis, using the already tagged PDF documents.
- Previously trained models like Document Image Transformer (DiT using R-CNN and Cascade R-CNN from Microsoft), Detectron2 (FAIR) and YOLOv4 using the Publaynet dataset to identify the different elements of a PDF document.

Named Entity Recognition and Entity Linking | *Python*

- Developed a chatbot based solution as part of a system to transform the current manual workflow to a completely automated workflow to retrieve financial documents of listed companies.
- Applied transformer based language models (like BERT, LUKE) to accurately identify multiple entities from a set of unstructured domain-specific data and link them.
- Optimized several language models (like BERT, RoBERTa) for performing the QA task (trained on SQuAD 2.0 dataset) to identify key entities from a user-given context as a PoC.

Semantic Search | *Python*

- Worked on a Knowledge Repository Platform employing `Sentence-BERT` (sentence-transformers).
- Demonstrated a better approach to improve the relevance of answers for queries, replacing the existing keyword-based search with contextual search for a set of domain-specific data.

Achievements

- Received recognition from RRD Leadership for **High Performance in Product Development** and for creating a new revenue stream for RRD in July 2022.
- Selected as **Employee of the Quarter** for **Delivery Excellence** (Q2 2021) from over 1500 employees by RRD.
- Received a **National Level Merit Scholarship** from the All India Council for Technical Education (AICTE) in 2015.

Undergrad Projects

Mathematical Expression Recognition and Evaluation **2017 – 2018**

Final Year Project | *Python, Java*

- Created a system to recognize handwritten mathematical equations and formulae from a photo taken via an android app.
- Analyzed the performance and accuracy of a Support Vector Machine and a Multilayer Perceptron with Backpropagation.
- Implemented the Baseline Structure Tree Algorithm for evaluation of the recognized equation.
- From over 1000 projects submitted, this project was **shortlisted among the first 50** for the 7th Computer Society of India in App National Student Project Awards 2018.

Skills

Languages: Python (PyTorch, scikit, nltk), C++, Java

Tools: Docker, Jupyter, Git

Web & DB: HTML, SQL