Desh Iyer

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Education

UPES — Dehradun, India
B.Tech in Computer Science & Engineering (Hons.) Spl. AI/ML, GPA: 8.53 — *August 2020 - May 2024 (Expected)*

Indian School Muscat — Muscat, Oman
CBSE Senior School Certificate Examination Class XII, Aggregate: 95.6% — *April 2020*

Indian School Muscat — Muscat, Oman
CBSE Secondary School Examination Class X, Aggregate: 92.8% — *April 2018*

Experience

Belle II Grid Computing and R&D Intern — March 2023 - Present
High Energy Accelerator Research Organisation (KEK) — *Remote (Tsukuba, Japan)*

- Collaborating with international research institutions (KEK in Japan, DESY in Germany, and Brookhaven National Lab in the USA) as part of the Belle II experiment
- Developing and utilizing tools like basf2, gbasf2, GitLab, and Jira, to support physicists in running simulations on particle accelerator equipment and the global Belle grid infrastructure
- Ensuring the smooth operation and performance of the grid for seamless data exchange among storage elements and collaborators
- Continuously optimizing the BelleDIRAC framework to improve data processing efficiency

Machine Learning Engineer Intern — June 2023 - September 2023
IBM — *Bengaluru, India*

- Collaborated with IBM executives on an innovative deep learning project focused on the generation of music compositions
- Conducted comprehensive research into music theory, data preprocessing techniques, and generative models to inform the development of the project
- Fine-tuned model hyper-parameters and utilized techniques like recurrent neural networks (RNNs) & generative adversarial networks (GANs) to achieve high-quality music generation results

NLP Reseach Intern — January 2023 - September 2023
UPES — *Dehradun, India*

- Conducted research on advanced Transformer models for high-level text processing, with a focus on optimizing their implementations to enhance natural language understanding and generation
- Integrated OpenAI's GPT-3 API into a comprehensive full-stack web application and developed a robust REST API using Flask to seamlessly connect with a React-based front-end, providing users with an interactive and intelligent text-processing experience

Data Engineer Intern — August 2022 - January 2023
Rawal Genomic Labs — *Delhi, India*

- Helped implement DNA Scanner, a web application for comparing DNA synthesis feasibility, price and turnaround time across vendors
- Developed and maintained various modules that provide a plethora of bio-informatics algorithms
- Worked on integrating and hosting these modules into DNA Scanner and the existing pipeline at the lab

Data Analyst Intern   July 2022 - August 2022
SSL   *Muscat, Oman*
- Developed a software-as-a-service content management system that handles high velocity data with minimal footprint
- Worked with multi-stream complex data models using QlikSense Enterprise
- Explored ways to minimise complexity of information retrieval

Projects

***What's Up Doc?* - Language Agnostic Code Documentation**   *Python, TensorFlow, Transformers, Git*
- Developed a Python CLI application using Click and Typer to automate code documentation creation for scripts in a given directory
- Integrated popular language models (CodeTrans, T5, CodeT5, Google Flan T5, etc.) via LangChain for efficient *text2text* generation
- Demonstrated skills in fine-tuning and quantizing open-source Hugging Face models, improving performance for code documentation
- Actively contributed insights and optimizations to models, engaging with the open-source community

***Splice and Dice* - Text Summarization with Transformers**   *Python, PyTorch, Streamlit, Git*
- Modularized multi-source text summarization with fine-tuned transformers in a web application
- Implemented various state-of-the-art transformers for text processing
- Experimented with image segmentation and auto-encoders

***Bulletin* - Project Management in Neovim**   *Neovim, Lua, Linode, Shell Scripting, GitLab*
- Built a Neovim plugin to keep track of tasks in code-bases
- Programmed logic to intelligently parse compiler messages and log file paths to suggest bug fixes
- Experimented with Neovim config support for Language Server Protocol (LSP) in Lua
- Implemented a development pipeline in GitLab to continuously integrate changes and deploy the tool
- Deployed the tool using Linode on a private server

***Filter Coffee* - Digital Filter**   *C++, CMake, JUCE, Git*
- Implemented various digital signal filters from scratch to craft a filter in C++ for optimal efficiency
- Performed a comparative analysis on different data structures to implement as the filter's buffer thereby leading to an efficiency vs. data structure infographic
- Developed the project further into a real-time visualiser using the JUCE C++ framework

***Echelon* - Collision Engine**   *C++, CMake, Unity, Git*
- Developed a simple physics engine that simulates the fundamental forces of nature
- Integrated into Unity to simulate collision mechanics between objects

Skills

Programming Languages: Python, C/C++, Lua, Rust, SQL (MySQL), JavaScript, HTML/CSS, R
Frameworks: TensorFlow, PyTorch, Node.js, Flask, FastAPI, Processing, p5.js
Developer Tools: Linux, NVIM, Linode, Git, Docker, VS Code, LaTeX
AI/ML: Transformers, Pandas, NumPy, Matplotlib, Seaborn, TensorFlow, Keras, PyTorch, Sklearn, nltk
Languages: Tamil (native), Kannada (native), English (proficient), Hindi (proficient), French (intermediate)

Awards and Honors

Academics

Academic Excellence Award, UPES   2021
Academic Merit Award, Indian School Muscat   2020

Model United Nations

Director General, Indian School Muscat Model United Nations (ISMMUN)   2019
Honourable Delegate, Modi School Model United Nations (MSMUN, Jaipur)   2019
Co-Chair, Indian School Muscat Model United Nations (ISMMUN)   2018
Best Delegate, Indian School Muscat Model United Nations (ISMMUN)   2017

Quizzing

8th out of 100+ teams in National Times of Oman Quiz   2020
2nd out of 30 schools in National Inter-school Quiz   2019
3rd out of 100+ teams in Cyber Quiz organized by Times of Oman   2019
1st out of 20 Indian Schools in Oman in the annual Quiz Pot   2016

Sports

3rd in CBSE Regional Basketball Clusters   2019
1st in Inter-house Basketball tournament   2018
3rd in CBSE Regional Swimming Clusters - 4x100m   2017

Passions

Volunteering

- Supported the elderly with **Dignity Foundation** by helping establish a social media brand identity and fundraising
- Worked on the #SPRINTforOMAN campaign - a volunteer movement bringing together fitness enthusiasts to support the **Environment Society of Oman (ESO)** Turtle Conservation Project

Music

Pursuing carnatic music and violin under the tutelage of Vidwan Shri. H K Venkatram (Vijaya College of Music, Bengaluru)

Speed-cubing

Member of the World Cube Association

- 3x3 PB - 8.72s
- 2x2 PB - 5.2s