Tarun Singh

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Education

Indian Institute Of Technology (IIT), Bhilai — Chhattisgarh, India
- *Bachelor of Technology - Electrical Engineering* — *Completed **May 2023***
  CGPA: 8.36/10

Delhi Public School Kalyanpur, Kanpur — Uttar Pradesh, India
- *Intermediate: 95.6%* — *2019*
  High School: 10 CGPA — *2017*

Skills Summary

- **Languages**: Python, C, C++, Java, SQL, Bash
- **Frameworks**: PyTorch, TensorFlow, Keras, NLTK, ScikitLearn, OpenCV, Django, Pandas
- **Tools & Tech**: Docker, GIT, LaTeX, MySQL, Linux
- **Coursework**: Artificial Intelligence, NLP, Blockchain, Data Analytics & Visualisation, Data Structures, Algorithms, DBMS (SQL), Cryptography, Probability, Linear Algebra, Financial Economics

Experience & Research

- **Arista Networks** — Remote
  Software Engineering Intern — *May 2022 - July 2022*
  Research, Development & Testing of new **Wireless Intrusion Prevention System** (WIPS) mechanisms to sever unauthorized connections between **Access Points(APs) and Clients** in a Network since the methods that were used with the 802.11 standard would not work after the **802.11w** amendment.

- **Improving Document-Reranking (NLP+IR)**
  under Dr. Soumajit Pramanik (IIT Bhilai) & his Colleagues from France — *December 2022 - Now*
  Developing a system to re-rank documents using a **combination** of Knowledge Graph embeddings along with textual data to give better and more relevant search results. Used a combination of **NLP & Information Retrieval** techniques involving GCNs, LSTMs, LLMs (eg. BERT), etc. MS-MARCO used as the primary datasets. Managed resource allocation and developed efficient algorithms under constrained resources.

Key Projects

- **AI Sudoku-Solver**
  Deep Learning & Computer Vision
  Developed a **Python** application to detect Sudoku from an image, and output a solution using Deep Learning & Computer Vision technologies. **Tensorflow** and **Keras** were used to generate a model based on **Neural Networks** for the recognition of Digits from Sudoku. Used **OpenCV** library to read images and implemented **Contour Detection** to identify Sudoku from the image. Currently working on improving digit recognition accuracy of the Model by improving the training dataset.

- **Multimedia Encryption**
  Cryptography
  Implemented the **GIFT-64 cipher** from scratch and used it to perform **Audio, Image and Text encryption / decryption**. Used Python **Wave** module and **base64** encoding to convert audio to binary data and break it into suitable block lengths for encryption / decryption.

- **Django WebApp**
  Web Development
  Created a To-Do list web application using Python and Django Framework for back-end and HTML5, CSS3 for front-end. Used **class-based views** rather than function-based views to reduce code redundancy. Included Search, Delete, Update functionality for the items in the list and also added Login/Registration feature for users.

Miscellaneous

- **Codeforces** Personal Highest Rating **1463** (**Specialist**)
  Global Rank: **791** in Round #760
- **Codechef** Personal Highest Rating **1767**
  Global Rank: **83** in Codechef May Cook-Off 2021 Division 3
- **Position of Responsibility**: Executive at National Service Scheme, IIT Bhilai *for 2019-2020 Session*
- Ranked among the top **4%** of all who were eligible for JEE Advanced 2019 and
  Among the top **4%** in JEE Mains 2019