JASKARAN SINGH

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EDUCATION

University of Nottingham, Nottingham, UK **Sep 2023 - Sep 2024**
Pursuing Master of Science in Computer Science with specialisation in Artificial Intelligence
Recipient of Developing Solutions Masters Scholarship.
Relevant Courses: Machine Learning, Fuzzy Logic, Data Science with Machine Learning, Intelligent Agents.

Graphic Era Deemed to Be University, Dehradun, India **Aug 2019 - Jun 2023**
Bachelor of Technology in Computer Science with *Distinction* **CGPA 8.85/10**
Relevant Courses: Data Science, Artificial Intelligence, Computer Vision, Programming Lab, Hadoop, Compiler Design, Software Engineering.

PROFESSIONAL EXPERIENCE

IntelliDigest, Edinburgh **Jan 2024 - Mar 2024**
Intern, *Machine Learning*

- Developed a soil nutrient composition model for farmlands by utilizing multispectral satellite images through ensemble deep learning models.
- Utilized Google Earth Engine to gather satellite images at various spatial resolutions, enabling the construction of a model API with a Flask backend.
- Constructed a crop recommendation system for farmers, leveraging acquired nutrient composition data from farms and factoring in the meal plans of connected end users.

Grey Orange Robotics, Gurgaon, India **Jun 2022 – Aug 2022**
Intern, *Machine Learning*

- Expanded the utility of the backend AI engine and tried to integrate it with an autonomous mobile robot.
- Conceptualized an image recognition software that can detect and alert fallen objects present near shelves using TensorFlow Lite and Docker Container and built a Jenkins pipeline for the same

Samsung Research Institute, Bangalore, India **Jul 2021 - Feb 2022**
Intern, *Research Department*

- Developed a Kotlin application for Android devices that takes multiple contextual information about the environment as input and maintains it in a MongoDB database.
- Built an AI-based recommender system for predicting suitable device behavior and deployed this module using a Flask API and integrated it with Kotlin application that interacts with the smart device ecosystem and provides automatic control over smart IoT devices.
- Improved the overall efficiency by 31% over 5 use cases, and Samsung has integrated it as an SDK.

ACADEMIC PROJECTS

Computer Vision envisioned Flood prediction mechanism

- Ideated and developed a computer vision model with an explainable AI module for Early Flood prediction using road quality, climate, forest cover, and cloud cover calculated from satellite images and data.
- Created a backend engine using python that used mathematics to find elevation angle and drainage area in conjugation with the main model.
- Won Smart India Hackathon 2022 organized by the Government of India for this project which was commended by the Ministry of Rural Development with adoption as a disaster management scheme.

Diabetic complication detection and mitigation using Knowledge base filtering

- Detected complications like diabetic retinopathy using image analysis, kidney disease and heart conditions arising from diabetes with a deep neural network architecture using TensorFlow for pattern recognition.
- Created a knowledge-based filtering recommender system using Pandas, Numpy and Neo4j (Graph-DBMS) and built a React application for the patient.
- Presented our project at the InnoHealth conference and Won Young Innovators Award.

Ransomware Detection Module Using Spline-Interpolated Deep Learning Models

- Designed a Neural network-based anomaly-based ransomware detection system using Pytorch.
- Employed Wireshark to sniff live traffic for generating log data for deep inspection using a trained deep learning model and used Cuckoo sandbox for demonstration.
- Generated a variation of Cubic spline interpolation for missing data and generated an additional 22 features using mathematics and networking schemes.

PUBLISHED PAPERS

- Singh, Jaskaran, et al. "SINN-RD: Spline interpolation-envisioned neural network-based ransomware detection scheme." Computers and Electrical Engineering 106 (2023): 108601.
- Singh, Jaskaran, et al. "Design of a Contextual IoT Framework for the Improved User Experience and Services." International Conference on Recent Trends in Artificial Intelligence and IoT. Cham: Springer Nature Switzerland, 2023.
- Singh, Jaskaran, et al. "GeneAI 3.0: powerful, novel, generalized hybrid and ensemble deep learning frameworks for miRNA species classification of stationary patterns from nucleotides." Scientific reports 14.1 (2024): 7154.
- Singh, Jaskaran, et al. "An Ensemble-Based IoT-Enabled Drones Detection Scheme for a Safe Community." IEEE Open Journal of the Communications Society (2023).
- Singh, Jaskaran, et al. "Attention-enabled ensemble deep learning models and their validation for depression detection: a domain adoption paradigm." Diagnostics 13.12 (2023): 2092.
- Singh, Jaskaran, et al. "Machine learning security attacks and defense approaches for emerging cyber physical applications: A comprehensive survey." Computer Communications 192 (2022): 316-331.

TECHNICAL SKILLS

- Programming Languages: Python, R, Matlab, C++, Java, MySQL, Julia, Kotlin
- Frameworks: Pytorch, Numpy, Tensorflow, Keras, Sklearn, Android Studio
- Technologies: A.W.S., Spark, Hadoop, MongoDB, Tableau, Docker

EXTRACURRICULAR ACTIVITIES

- Represented the Indian team in the UNESCO India-Africa Hackathon by proposing a low-cost solution for water allocation using blockchain that helps in the transparent distribution of water in impoverished regions of Africa in November 2022.
- Volunteered in Mumbai based startup that recycles waste to make furniture, helping to raise awareness in February 2022.
- Served as a technical head in the student chapter of IEEE for a period of 1.5 years. Directly mentored almost 150 students during my tenure and conducted sessions on machine learning and data science for students during the years 2020-2021.