Harjeet Singh

PLC | HMI | SCADA |
IoT | Industry 4.0
Artificial Intelligence | Machine Learning
Master of Artificial Intelligence University of Surrey | United Kingdom

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Professional Summary

Innovative Artificial Intelligence Engineer with 15 years of experience in application design, development, and testing. Specialized in delivering over 20 projects in industrial automation and automobile testing automation, utilizing machine learning and artificial intelligence. Proficient in PLC, SCADA, HMI, IoT, Python, InfluxDB, SQL, MQTT, and edge devices, with a dedicated focus on advancing industry solutions with AI technology. Possesses strong knowledge of process industry automation and powertrain test beds. Excellent communication and leadership skills.

Employment

05/2024– Working

Foxconn GmbH, PLC Software engineer, Solihull United Kingdom.
- JLR Range Rover chassis assembly dashboard on **Power BI:** Production cycle time improved by 2%.
- Digital shop floor meeting: Fully replaced paper-based meetings, reducing daily meeting time by 50%.
- Plant PLC data via PCS and SQL recorded for JLR chassis codes and cross-department analysis.
- YOLO model for forklift safety monitoring with automated weekly incident report generation.
- Machine learning implementation for plant power analysis to identify energy savings possibilities.
- Specialized in S7, Rockwell PLC, HMI, SCADA, Indra drive SEW, and advanced automation systems.

02/2024– 06/2024

Direk Limited, Principal IoT Consultant (Part time), United Kingdom.
- Product owner for Environmental, Power, and Industry 4.0 modules development and implementation.
- Embedded and python communication protocol LoRaWAN, NB-IoT, BLE, RTU, Zigbee, WiFi, BMS Integration to support BMS-AI application.

03/2023– 01/2024

Armfield Ltd. Software Engineer (Part time), United Kingdom.
- Product development in PLC, SCADA, HMI, Raspberry Pi, Arduino programming, and automation.
- Software development with Node-RED integrated into Svelte app for enhanced functionality.

11/2019– 01/2023

AVL Pvt. Ltd, IoT & Utility Applications Manager, India.
- Successfully designed, conceptualized and implemented Industry 4.0 factory automation six+ projects.
- Automation and control philosophy, network architecture preparation for 10+ automobile OEMs.
- Data acquisition, transmission, storing retrieval for OEE, plant maintenance, production reporting.
- **Tools** : Python, InfluxDB, SQL, Linux , MQTT, Grafana, Node-Red, Raspberry-pi, Arduino, Power BI.
- **Packages**: Scikit-Learn, NumPy, Pandas, Matplotlib, Pytorch, Tensor Flow, Open-CV, keras, NLTK.
- **Statistics/ML/DL/AI**: Statistical Analysis, Linear/Logistic Regression, CNN, transformers.
- **Projects:** Cummins (UK , China), Daimler, Mahindra & Mahindra, Perkins, Maruti Suzuki, iCAT.
- **Products developed:** Image processing, OCR, License plate reader, movement tracking.

02/2014– 01/2019

AVL Pvt. Ltd, System Designer, AVL India, Gurugram, India, Assistant Manager
- Managed 8+ engineers team for AVL powertrain test bed utilities control system designing, programming and commissioning.
- Hands on experience on AI, ML, DL, PLC, HMI, SCADA, E-Plan, Auto CAD, PCB design.
- BMS / BACS automation includes HVAC, Fuel, Building access, Power Monitoring etc.
- Successfully developed industry communication protocols drivers in python language.

09/2011– 01/2014

AVL Pvt. Ltd, Engineer, AVL India, Gurugram, India, Senior Engineer.
- PLC programming in ladder logic, robotics, Automatic engine docking system commissioning.
- Power management communication and data acquisition.
- Hydrocarbon fuel management programming, maintaining. Monitoring by fire and gas system.
- Powertrain testbed automation with microcontrollers programming, hydraulic system programming.

12/2008 – 06/2011

AVL Pvt. Ltd, Engineer, Punj Lloyd Doha Qatar. Oil and Gas refinery.
- Collection and formatting of data for refinery operators on central supervisory system.
- Improved plant data collection and saved 40% hours by deploying centralized monitoring system.
- Active team member of oil and gas refinery programmers and automation team.

Education

02/2023 – 02/2024

Master of Science in Artificial Intelligence University of Surrey | **United Kingdom**
Majors: Vision, speech and signal processing, Machine learning, AI Health, Natural language processing (NLP), Deep learning, AI programming. Expected Marks : First Class.
Dissertation title: Implementation of AI techniques to simulate the Proton Exchange Membrane (PEM) water electrolyser behaviour for green hydrogen production.

06/2005 – 06/2008

Bachelor of Technology in Electrical and Electronics Engineering Guru Gobind Singh IndraPrastha University | **India (Delhi) |** Percentage: 76%

06/2002 – 06/2005

Diploma in Electrical Engineering Board of Technical Education | India (Delhi) | Percentage: 75%

2013

Additional Certifications

Siemens PLC certification on **fail safe** programming

2024

18th Edition of BS 7671: IET Wiring Regulations,

Value to Employer

Experience in PLC and SCADA automation within automobile OEM manufacturing plants.
Data engineering in automating data collection from OEM plants by developing Python drivers.
Machine learning ML, Deep learning DL, Artificial Intelligence AI, conceptualization, designing of system, project deployment, execution and testing.
Providing technical support and leadership to cross functioning teams working to improve product and project quality.
Refine workflow processes within software development environment.

Competition participation

Successfully won the Santander Propeller Fund UK award of the year 2023 for the best business idea and implementation based on sustainable AI and IoT industry 4.0.

Software knowledge

Python, JavaScript, SQL, InfluxDB, Arduino, Raspberry Pi, C, C++, MySQL, DBMS, RDBMS, Matlab, Multisim, CircuitMaker, E-TAB, Power Factory (DIgSILENT), AutoCAD, and a variety of machine learning, deep learning, and artificial intelligence frameworks. Including but not limited to TensorFlow, PyTorch, Keras, Scikit-Learn, and NLTK.

Languages

English: fluent
Hindi : fluent
Punjabi : mother tongue

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March, 2024

• **PLC SCADA Project**: Deployed a comprehensive plant automation and control system integrating Honeywell BMS, Allen Bradley, and Phoenix PLC automation, centralized to a Siemens SCADA platform. Enabled seamless control and monitoring of the entire production line for Bharat Benz Truck OEM manufacturing, optimizing process efficiency and ensuring robust system interoperability.

• **PLC SCADA Project**: Designed a SCADA system for a gas and oil refinery to control the gas boosting station as part of a cross-country gas pipeline project. Implemented real-time monitoring and control functionalities, ensuring efficient operation and safety of the gas transportation process. Integrated PLC systems for seamless data acquisition and automation, facilitating effective decision-making and operational efficiency.

• **IoT Project:** Delivered a project to a petrol pump owner featuring a license plate recognition system using a YOLO model implemented on a Raspberry Pi. This machine learning-based solution was designed to perform two key functions: first, to trigger an alarm upon detecting a defaulting license plate, and second, to announce reward points for eligible car owners.

• **IoT Project:** Developed energy management software on a Raspberry Pi Linux system, deployed across 15+ electrical substations. This solution was implemented for various industries, including engine testing facilities, automobile manufacturers, glass manufacturers, hydro agriculture, test centers, and the food and beverage industry. The project involved real-time energy monitoring, data acquisition, and optimization to enhance efficiency and sustainability in diverse operational environments.

• **Machine Learning:** Implementation of AI techniques to simulate the Proton Exchange Membrane (PEM) water electrolyser behaviour for green hydrogen production. (Toward UK Net Zero Emission target).

• **NLP: Emotion detection** in text using the GoEmotions dataset. Preprocessing steps were applied to refine 27 emotion categories into 14 broader categories. Models like BERT and DistilBERT were used for classification, implemented with libraries such as Transformers (Hugging Face), scikit-learn, and PyTorch. The goal was to highlight critical NLP stages, from data preparation to model training and evaluation, for accurate emotion analysis.

• **Computer vision:** Developed a **Knife Classification System using deep learning** to identify knife categories from images for law enforcement applications. Utilized a dataset of 9,928 images across 192 classes, implementing CNN-based models in PyTorch on Google Colab. The system improves knife recognition accuracy, aiding in crime prevention and analysis.

• **Audio :** Developed an **AI-based Heart Sound Analysis System** for the PhysioNet Challenge to detect murmurs using digital stethoscope recordings. Implemented machine learning models to classify heart sounds as murmur, no murmur, or unclear. Gained hands-on experience in healthcare AI, healthcare data preprocessing, and advanced problem-solving techniques.

• Developed a **Vehicle Re-Identification System using Convolutional Neural Networks (CNN) in PyTorch** on Google Colab to identify the same vehicle across non-overlapping camera views. Tackled challenges like viewpoint variations and occlusions, creating a robust system for traffic management and law enforcement. Gained expertise in training, evaluating, and fine-tuning deep learning models for complex real-world vision tasks.

• **3D Image:** Developed a **Knee Abnormality Classification System using Vision Transformers (ViT)** to detect ACL tears, meniscal tears, and other abnormalities in MRI images from the MRNet dataset. Utilized pre-trained models from the `timm` library and fine-tuned them for medical imaging tasks, applying advanced data augmentation techniques. The project involved building and evaluating ViT models in PyTorch for accurate multi-class classification of knee injuries.