Hansika Gunasekara

An Innovative Machine Learning Engineer

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About Me

An accomplished ML Engineer with a 9 year expertise immersed in the frontier of AI technologies, architectures and frameworks. My portfolio is impressive with US patents & research publications. I deliver full stack python solutions for Data Analytics, ML, NLP, Generative AI & Computer Vision problems.

Experience

Machine Learning & Data Analytics Consultant, Self-Employed **Oct 23 - Present**

- Designing a multi-agent Anaesthetic Application for real time monitoring clinical scenarios in surgical operation theatres and assisting anaesthetists in efficient decision making
- Developed & deployed a ML regression model to predict the accident risk level of 0-1 which achieved a Root Mean Square Error(RMSE) of 0.055 on the unseen ~800K test dataset
- Replicated the research paper associated with CONVFINQA dataset to adopt LLMs for numerical reasoning on financial reports

Lead Machine Learning Engineer, Synopsys **Nov 16 - Sept 23**

- Delivered a ML based Intelligent Test Selection solution(ITS) to chip design customers which reduced their CI/CD cycle time by compressing the number of test cases by >80%
- Collaborated with a number of software development teams globally to adopt ITS into their CI/CD pipeline and enhance developer efficiency in code committing to a 30 year evolved c++ codebase
- Engineered a well-structured monitoring system using Prometheus, Alertmanager & Airflow DAGs to enhance operational efficiency to real-time monitor 6 Docker micro-services
- Owned the MLOps pipeline in MLFlow for porting the model to customers & identify the data drift & model drift where I resolved a data drift issue in customer with limited access to their data warehouse in ~8hrs
- Led customer release as 2 week sprints to ship a number of features for the ML product including Nginx proxy manager to decouple client side & server side python code libraries
- Developed the Proof-of-Concept(PoC) in 6 months with ownership in libraries for data collection, feature engineering, ensemble learner tuning & ML model monitoring
- Innovated the minimum viable product(MVP) to address the pain points in CI/CD test cycles by combining daily CRMs, code coverage(50GB), code commits(>80/day) & regression test runs as a big data warehouse for data analytics & machine learning

Education

Data Analytics Bootcamp, East Sussex **Sept 25 - Present**
Bachelor of Science in Engineering(Hons) **Oct 12 - Oct 16**

US Patent

Method and Apparatus for Intelligent Regression Test Selection and Prioritization for RTL Design Verification Using Machine Learning Techniques (Application Number: 17168674) **May 21**

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Skills

Programming: Python, C++, C, SQL, Shell
AI Frameworks: MLFlow, Scikit-learn, Pandas, Vertex AI, Google-ADK, Pytorch, Hugging Face
CI/CD: Docker, Redis, Yaml, Google Cloud, Spark, Terraform, Ansible
Tools & Environments: Jupyter, GCP, Git, Prometheus, Linux, Tableau, PowerBI, BigQuery, Jira
Soft Skills: Strong analytical thinking, Clear communication, Remote collaboration, Research Resillience

Projects

Accident Risk Predictor Github Project **Nov 23**

- Fine tuned an ensemble learner regression model to predict accident risk level(0-1) for a given set of road, infrastructure and environmental conditions which achieved a RMSE of 0.055
- Identified trends in data through detailed exploratory data analysis, handled data preprocessing, feature engineering, model training, evaluation, deployed a streamlit web application Streamlit App
- Technologies: Hyper parameter tuning, Regression ensemble models, Steamlit, PowerBI, XGBoost

ML based Intelligent Test Selection(ITS) **Nov 16 - Sept 23**

- Built a robust ML pipeline to reduce the size of testsuite by >80% ingesting effectively engineered features from code commits, code churn, coverage, test reports and customer Stars
- Authored a US patent & published the research in two major conferences in US & Taiwan
- **Technologies:** Python, SQL, Scikit-learn, Classification, Pandas, MLFlow, Docker, Prometheus, PostgreSQL, Ansible, YAML, Airflow, Ensemble Models, Spark, Django, Kibana

Texture Based Image Analysis using Deep Learning **Jan 16 - Oct 16**

- Fine tuned convolutional neural networks for image texture classification & segmentation which achieved >95% classification accuray & >85% segmentation accuracy on two open source datasets
- Analyzed & compared the classification accuracy with intensity histogram and dimensionality reduction techniques on texture feature vectors
- Authored a research paper in an International IEEE conference on Industrial & Information systems
- **Technologies:** Python, Matlab, Jupyter Notebooks, Pytorch, Deep Learning, Computer Vision, Linear Discriminant Analysis

Awards

Stack Overflow Road Safety Challenge Badge Award View Certificate **Nov 25**

Research Publications

RTL Regression Test Selection using Machine Learning **Jan 22**
27th Asia and South Pacific Design Automation Conference, Taipei, Taiwan Publication Link

Intelligent RTL regression test selection using Machine Learning **Dec 21**
IEEE 58th Annual Design Automation Conference, San Francisco, US Event URL

Image Texture Analysis Using Deep Neural Networks (First author) **Dec 17**
IEEE 12th International Conference on Industrial and Information Systems, Sri Lanka Publication Link

Texture Based Image Recognition Using Deep Neural Networks (First author)
Young Members' Technical Conference, The Institution of Engineers, Sri Lanka