

# SIVAKUMAR A

## AI & ML Engineer

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### PROFILE SUMMARY

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AI & Machine Learning Engineer with hands-on experience in building end-to-end ML and deep learning systems, including data preprocessing, feature engineering, model development, evaluation, and deployment. Strong background in neural networks, time-series forecasting, OCR pipelines, and explainable AI (XAI). Proven ability to translate raw data into scalable, production-ready AI solutions using Python, TensorFlow, PyTorch, FastAPI, and cloud-ready architectures.

### TECHNICAL SKILLS

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- **Languages:** Python, Java, C, JavaScript, SQL
- **Machine Learning:** Supervised & Unsupervised Learning, XGBoost, Scikit-learn, Feature Engineering
- **Deep Learning:** TensorFlow, PyTorch, Keras, CNN, LSTM, Attention Models, Transformers
- **NLP & Computer Vision:** Hugging Face Transformers, BERT, GPT, SpaCy, OpenCV, YOLO, ResNet, VGG
- **Data Science:** Pandas, NumPy, Matplotlib, Seaborn, Plotly, EDA, Statistical Analysis
- **Deployment & Tools:** FastAPI, Django, REST APIs, Git, Docker, Jupyter, VS Code

### KEY PROJECTS

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**SwastAid - AI-Powered Diabetes Management & Medication Assistant** *Python, Flutter, FastAPI*

- Designed and developed a production-oriented AI healthcare application for diabetic patients using Python and Flutter.
- Implemented OCR-based medical report extraction to capture glucose values automatically from physical reports.
- Built ML-driven personalized meal recommendations based on user health data and historical reports.
- Deployed scalable backend services using FastAPI to handle real-time vitals tracking and pill reminders.

**Advanced Time Series Forecasting using Neural Networks** *TensorFlow, LSTM, Attention*

- Built LSTM and Attention-based deep learning models for long-horizon time-series forecasting.
- Performed advanced sequence generation, normalization, and feature engineering to prepare temporal data.
- Improved forecasting performance significantly compared to traditional statistical baseline models.
- Evaluated models using MAE, RMSE, and MAPE, creating data visualizations to communicate trends.

**Credit Risk Prediction - Machine Learning Pipeline** *Scikit-learn, SHAP, LIME*

- Developed an end-to-end ML classification pipeline for credit risk analysis to predict loan defaults.
- Conducted EDA, preprocessing, class imbalance handling (SMOTE), and rigorous feature selection.
- Integrated SHAP and LIME libraries to ensure model explainability and regulatory transparency.
- Evaluated performance using Accuracy, Precision, Recall, F1-Score, and ROC-AUC metrics.

## ADDITIONAL PROJECTS

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### Electricity Demand Forecasting using XGBoost

- Developed a time-series machine learning model to forecast electricity demand using historical consumption data.
- Engineered time-based features (hour, day, week) and lag features to capture temporal patterns.
- Implemented TimeSeriesSplit for proper train-test validation to strictly avoid data leakage.
- Trained an XGBoost Regressor to model non-linear demand patterns, achieving high regression accuracy.

### Smart Grid Anomaly Detection using Autoencoders

- Built an unsupervised deep learning model to detect abnormal electricity consumption patterns in smart grid data.
- Trained a Deep Autoencoder to learn normal consumption behavior and detect deviations based on reconstruction error.
- Applied threshold-based anomaly detection to classify abnormal usage patterns.

## WORK EXPERIENCE

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### Service Engineer

Jan 2015 – Aug 2025

- Performed advanced diagnostic analysis on complex systems, identifying failure patterns and using data-driven methodologies to improve reliability.
- Leveraged root-cause analysis and structured troubleshooting to streamline workflows, laying the groundwork for automation.
- Collaborated with cross-functional teams to translate technical issues into measurable operational metrics for decision-making.

## CERTIFICATE & EDUCATION

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<b>Cultus Education &amp; Technology</b>	2025
Data Science & Artificial Intelligence	
<b>Outskills</b>	2025
Generative AI Mastermind	
<b>B.E. - Electrical and Electronics Engineering</b>	2015
Nandha Engineering College	
<b>Higher Secondary</b>	2010
R.C.M.H.S. School, Erode	