

# KARTHIK KUNNAMKUMARATH

AI Solutions Developer | Deep Learning Engineer | PMP® | CSM®

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## PROFESSIONAL SUMMARY

Production-grade AI Solutions Developer and Deep Learning Engineer with a unique edge: Aerospace Engineering roots, PMP® & CSM® certifications, and 5+ years of technical leadership — now building end-to-end ML/DL systems that solve real-world, high-stakes problems. Proven track record across predictive maintenance, smart grid forecasting, NLP, and computer vision. Equally comfortable architecting a BiLSTM + Transformer pipeline as leading a cross-functional Agile team. Seeking AI/ML Engineering, Data Science, or Applied AI Co-op/Entry-Level roles in Toronto and remote.

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## TECHNICAL SKILLS

- **Languages:** Python, SQL, JavaScript
  - **Deep Learning:** PyTorch, TensorFlow, Keras — CNNs, LSTMs, BiLSTMs, Transformers, TCNs, Autoencoders
  - **Generative AI & LLMs:** LangChain, Hugging Face Transformers, ChatGPT, Gemini, Claude code, Copilot, Openclaw
  - **ML & Data Science:** Scikit-Learn, Pandas, NumPy, Random Forest, SVM, Ensemble Methods, LightGBM, XGBoost
  - **Computer Vision:** OpenCV, YOLO, Real-time Detection, Background Subtraction
  - **NLP:** Transformers, NLTK, Gensim, spaCy, CRF, LDA, Sentiment Analysis, Text Summarization
  - **Deployment & MLOps:** Streamlit, FastAPI, Docker, Jupyter
  - **Data Engineering:** ETL Pipelines, SQL, Big Data Concepts, Feature Engineering
  - **Tools & Ops:** Git/GitHub, Tableau, Power BI, Jira, Trello, Maximo (CMMS)
  - **Project Management:** Agile/Scrum, Waterfall, PMP®, CSM®
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## AI PROJECTS

### [Turbofan Engine Predictive Maintenance AI](#)

*Deep Learning · BiLSTM · Transformer · Streamlit · NASA C-MAPSS Dataset*

- Built a production-grade Prognostics & Health Management (PHM) system predicting Remaining Useful Life (RUL) of jet engines using the NASA C-MAPSS dataset (100 engines, 21 sensors).
  - Engineered a BiLSTM + Transformer hybrid architecture for multi-sensor time-series regression; reduced input dimensionality from 21 to 14 features via correlation-based sensor selection.
  - Applied RUL clipping at 125 cycles to model only the degradation phase, improving model signal quality.
  - Deployed a live Streamlit dashboard for real-time RUL monitoring with interactive sensor visualizations.
  - Impact: Enables proactive maintenance scheduling — applicable to aerospace, manufacturing, and heavy industry to prevent catastrophic failures and reduce unplanned downtime.
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### Electricity Load Early Warning System

*Transformer · BiLSTM · TCN · LSTM Autoencoder · Time-Series · Smart Grid*

- Designed and benchmarked 8 deep learning architectures on the UCI Electricity Load dataset (140K timesteps x 370 clients) for binary classification of high-load events.
  - Framed problem: “Given a 6-hour grid window, predict a load spike in the next 60 minutes” — threshold at 95th percentile, sustained 4+ timesteps.
  - Transformer achieved best F1; TCN achieved best recall (0.928) for zero-miss safety-critical deployment; GRU achieved best precision (0.796) for minimal false alarms.
  - Implemented an unsupervised LSTM Autoencoder detecting 83 confirmed anomaly events with zero labeled training data.
  - Impact: Empowers energy operators with predictive intelligence to pre-empt grid overloads and optimize energy distribution at scale.
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### Stellar Classification: Space AI — 97.6% Accuracy

*Random Forest · GridSearchCV · Scikit-Learn · 100K Dataset*

- Classified 100,000 celestial objects (Stars, Galaxies, Quasars) from the Sloan Digital Sky Survey (SDSS) with 97.6% accuracy.
  - Applied exhaustive hyperparameter tuning via GridSearchCV on a tuned Random Forest classifier.
  - Impact: Demonstrates scalable ML classification on large real-world datasets — methodology transferable to any high-volume industrial labeling task.
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## **AutoFeatureSelector: Automated ML Tooling**

*LightGBM · Pearson Correlation · Chi-Square · RFE · Lasso · Ensemble Voting*

- Built a reusable automated feature selection tool running 6 algorithms simultaneously: Pearson Correlation, Chi-Square, RFE, Lasso (L1), Random Forest, and LightGBM.
  - Aggregates results via ensemble voting to surface the most statistically and model-validated predictors.
  - Impact: Reduces feature engineering time from days to minutes; plug-and-play across any ML pipeline.
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## **Prescription Parser: Healthcare NLP**

*CRF · Named Entity Recognition · Healthcare AI*

- Developed a CRF-based NLP model converting unstructured prescription text into structured data: Drug, Dosage, Frequency, Duration.
  - Impact: Applicable to pharmacy automation and EHR/EMR systems — reduces transcription errors and manual data entry costs.
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## **Thief Detector: Computer Vision Security System**

*Python · OpenCV · Background Subtraction · Real-Time Video*

- Built a real-time surveillance system using background subtraction to detect intruders, draw bounding boxes, and auto-record evidence from live webcam feeds.
  - Impact: End-to-end computer vision deployment for real-world physical security applications.
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## **PROFESSIONAL EXPERIENCE**

### **Maintenance Project Supervisor — Estee Lauder Companies, Markham, ON (2022 – Present)**

- Improved team velocity by 25% through Agile/Scrum adoption and sprint-based delivery practices.
- Automated Jira and Maximo (CMMS) workflows with Python-based KPI scripts, cutting issue resolution time by 30%.
- Managed IT and engineering system integrations, reducing operational downtime by 40%.
- Built data-driven reporting dashboards for operations optimization and executive decision support.

### **Project Manager, IT & Construction — Sangeeth Builders, Kerala, India (2017 – 2019)**

- Delivered \$500K+ in IT and construction projects with 100% on-time completion.

- Built a digital inventory management system, reducing procurement and reporting delays by 50%.
  - Trained 20+ staff on Jira, MS Project, and digital workflow tools.
  - Applied Agile for IT streams and Waterfall for construction projects.
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## EDUCATION

- Postgraduate Certificate — Applied AI Solutions Development | George Brown College, Toronto | 2025-2026
  - Postgraduate Certificate — Process Quality Engineering | Conestoga College | 2020
  - Postgraduate Certificate — Project Management | Conestoga College | 2019
  - B.Tech — Aerospace Engineering | Amrita Vishwa Vidyapeetham, India | 2017
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## CERTIFICATIONS

- PMP® — Project Management Professional | Project Management Institute | ID: 3563837 | Valid through 2029
  - Certified ScrumMaster® (CSM®) | Scrum Alliance | ID: 1961753 | Valid through 2026
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