

GOKUL KRISHNA N V

Machine Learning Engineer · ML for Engineering Simulation

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SUMMARY

Machine learning engineer with 7+ years in engineering simulation, applying ML to CAE/FEA/CFD data in automotive and medical devices. At General Motors, Kriging surrogates built with the CAE team cut design evaluation from 5–12 hours to 2–3 minutes; recently benchmarked neural point-cloud surrogates against classical DOE/Kriging on 3D CFD geometry. Mentored 60+ engineers; MSc ML & Deep Learning (Distinction).

APPLIED PROJECTS

- **DrivAerNet++ — Classical vs Neural Drag Surrogates** (2026 | PyTorch, CUDA, scikit-learn, Pandas, SciPy): independent benchmark study. End-to-end geometry-aware surrogate pipeline (data prep, training, validation, uncertainty estimation, inference) predicting CFD drag from 3D car surface point clouds. RegPointNet reached test R^2 0.76 ± 0.02 (MAE 0.0045) from 330 training cars. medium.com/@iamgokul93
- Classical track: on the 4,165-car parametric subset Kriging/GP was dominated on both accuracy and cost (negative R^2 at $n=50$, ~85x slower than gradient boosting), while a 14-descriptor Ridge model came within ~0.05 R^2 of the deep net with no GPU. Delivered calibrated 90% intervals on the parametric model (90.5% coverage) and an honest negative result on active learning.
- **Phishing Detection API** (2024–2025) production ML system: FastAPI, Celery/Redis jobs, DVC, MLflow, Optuna model selection, CI/CD.

EXPERIENCE

Design & Automation Engineer | Protech Stainless Ltd *Bedford, UK · Jan 2026 – Present*

- **Scoped, architected and owned end-to-end delivery, as sole engineer, of a telemetry-instrumented suite of 15+ versioned automation tools** (Python, C#/.NET) for CAD, BOM and procurement workflows; adopted across the design team, with 370+ operations logged in 4 months.
- Deployed a role-based operations service to production on AWS EC2 (Docker, S3, GitHub Actions CI/CD), used daily.
- Engineered a document-extraction pipeline ingesting supplier quotations (PDF/Excel/Word), matching part references against BOMs with confidence-based human-in-the-loop review.
- Created the team's tool-distribution architecture (manifest-driven installer + CAD ribbon integration) and a shared, reusable telemetry library (Python/C#).

CAE Data Scientist & FEA Engineer | General Motors (client engagement via TCS) *Bangalore, India · Sep 2019 – Aug 2023*

- **Developed and delivered ML surrogate models with the CAE team**, replacing Abaqus structural vibration and durability simulations (Kriging + evolutionary algorithms) and cutting design-point evaluation from 5–12 hours to 2–3 minutes; drove adoption across the engineering group for production design decisions.
- **Scoped and ran DOE-driven structural vibration and durability loadcase campaigns on HPC clusters** across a ~900-point geometry design space, using sparse and adaptive sampling to minimise expensive solver runs.
- **Defined surrogate validation standards** (held-out simulation testing and uncertainty-based trust regions), so predictions met engineering sign-off requirements, not benchmark metrics.
- Contributed to multi-objective optimisation of a production EV battery platform, achieving ~11% structural mass reduction; designs verified by full simulation before sign-off.
- Built 3D FE mesh tooling and simulation automation (Python, Tcl/Tk, HyperMesh): weld creation –40%, contact creation –22%, mesh-quality correction –26%, plus a QC checker saving ~15% annual effort.
- **Led ML enablement for 60+ engineers** in surrogate modelling, FEA integration and automation; communicated model capabilities, limits and trade-offs to design leads and stakeholders.

Structural Analysis Engineer | Johnson & Johnson MedTech (client engagement via TCS) *Kolkata, India · Feb 2017 – Aug 2019*

- Conducted R&D structural analysis (Abaqus, HyperMesh) for Ethicon and DePuy surgical device portfolios; piloted Optistruct design optimisation into the design cycle.
- Wrote FE mesh-morphing scripts saving ~20% of DOE model-generation effort.

EDUCATION & CERTIFICATIONS

- MSc Machine Learning & Deep Learning, University of Strathclyde (Sep 2023 – Nov 2024), Distinction
- B.Tech Mechanical Engineering, Mahatma Gandhi University (2012–2016)
- Certifications: MLOps Bootcamp (Udemy, 2025) · PG Cloud Computing (Caltech CTME) · PG AI & Machine Learning (Purdue)

SKILLS

- **ML / Deep Learning:** PyTorch, scikit-learn, Pandas, SciPy, Optuna, surrogate modelling, Kriging/GP, point-cloud models (PointNet/DGCNN), LLM fine-tuning, time-series forecasting (LSTM)
- **Simulation & Engineering:** Abaqus, HyperMesh, Optistruct, FEA, CFD datasets, 3D mesh & point-cloud processing, geometry parameterisation, DOE, adaptive sampling, multi-objective optimisation, HPC clusters
- **ML Systems & Cloud:** ML data pipelines, training & inference pipelines, FastAPI services, MLflow, DVC, Docker, GitHub Actions CI/CD, AWS (EC2, S3, SageMaker, Lambda), on-prem & HPC deployment
- **Programming & Domains:** Python, C#/.NET, Tcl/Tk · Automotive, medical devices, external aerodynamics (CFD)