

ENGINEERING DATA ANALYTICS & APPLIED AI

Engineering-focused analytics and machine learning for prediction, surrogate modelling, optimization and interpretable technical insight.



LEARN.

Extract structured insight from complex engineering data.



PREDICT.

Build accurate models that support engineering decisions.



SURROGATE.

Replace costly simulations with fast, validated surrogate models.



OPTIMIZE.

Explore design spaces and identify optimal solutions with confidence.



EXPLAIN.

Interpret model behaviour with explainable AI techniques.



**DATA
ANALYTICS**



**MACHINE
LEARNING**



**SURROGATE
MODELLING**



OPTIMIZATION



**EXPLAINABLE
AI**



**ENGINEERING
INSIGHT**

ENGINEERING DATA ANALYTICS & APPLIED AI

Engineering-focused analytics and machine learning for prediction, surrogate modelling, optimization and interpretable technical insight.



TYPICAL CLIENT CHALLENGES



Simulation, experimental or operational data are available but underused.



A prediction, regression or classification task must support an engineering decision.



Computationally expensive simulations need a surrogate model or reduced evaluation cost.



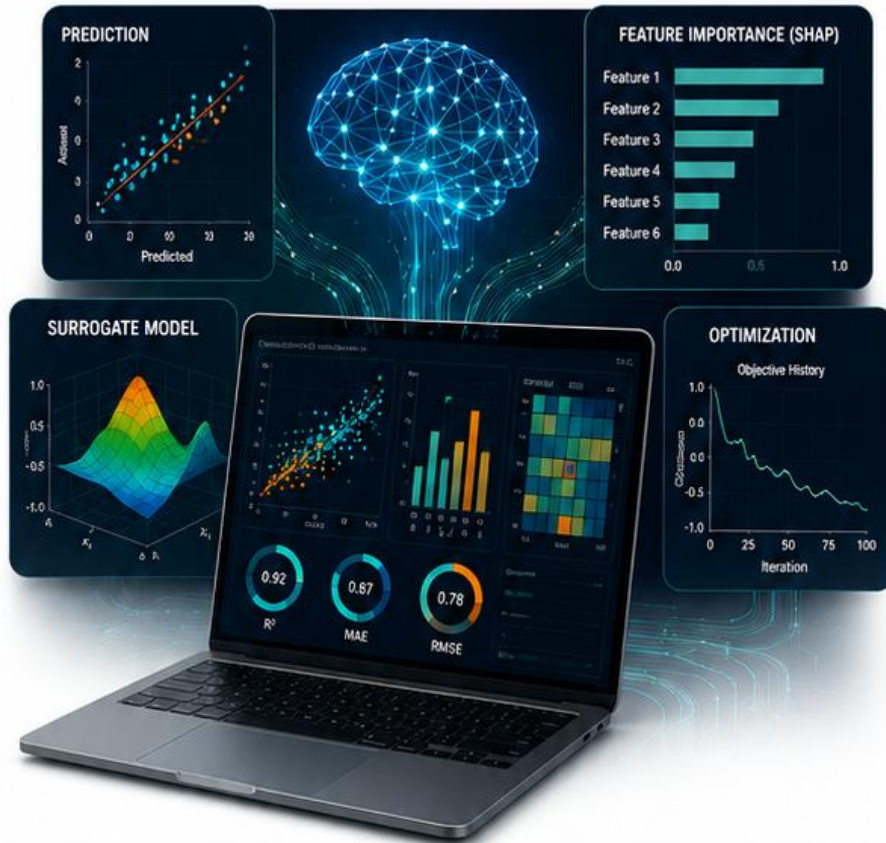
Multiple candidate models must be compared using technically meaningful validation.



Optimization or sensitivity analysis is needed around an engineering response.



Interpretability, feature importance, SHAP or another suitable explainability method is required to connect model behaviour with engineering reasoning.



**STRUCTURAL &
OFFSHORE**



**FLUID &
HYDRAULIC**



**ENERGY &
PROCESS**



**INFRASTRUCTURE
& CIVIL**



**SAFETY &
RELIABILITY**



SCOPE OF SUPPORT

Capability	Typical support
Engineering data assessment	Data quality, completeness, provenance, sampling structure, feature/target definition and suitability for the intended engineering analysis.
Predictive modelling	Regression/classification and model comparison using appropriate baselines, data-partition logic and validation strategy.
Surrogate modelling	Data-driven approximation of simulation or experimental response for rapid evaluation, sensitivity studies or downstream analysis, with validation over the intended domain.
Optimization	Optimization workflows using validated models or surrogates where the objective, constraints, search space and applicable engineering bounds are technically defined.
Explainable AI	Feature importance, SHAP or other suitable interpretability methods connected to engineering meaning and known physical behaviour where applicable.



DATA-DRIVEN INSIGHT

Unlock value from engineering and operational data.



PREDICT & OPTIMIZE

Build accurate models and optimize with confidence.



EXPLAIN & TRUST

Interpretable models aligned with engineering reasoning.



REPRODUCIBLE & RIGOROUS

Transparent methods, validation and reproducible workflows.

TYPICAL TECHNICAL WORKFLOW



TYPICAL DELIVERABLES

-  Python/MATLAB scripts or agreed computational tool components.
-  Defined input/output structure and configuration files where applicable.
-  Automated processing, plotting or reporting workflow.
-  Representative tests and validation evidence against known results, manual calculations or reference cases where feasible.
-  README/user notes, dependency information, configuration requirements and execution instructions appropriate to scope.
-  Source files and handover package as defined in the proposal.



TECHNICAL QUALITY FOCUS

-  Numerical correctness and engineering consistency of implemented calculations.
-  Clear handling of units, data types, missing/invalid inputs and failure conditions where relevant.
-  Reproducible execution and traceable inputs/outputs.
-  Testing on representative cases rather than demonstration-only code.
-  Maintainability and documentation proportional to whether the deliverable is a prototype, project script or reusable tool.

BEST SUITED FOR



TYPICAL CLIENT INPUTS

-  Current workflow description
-  Representative input/output files
-  Formulas and technical rules
-  Existing scripts where relevant
-  Solver / software environment
-  Expected batch volume
-  Required output format
-  User / deployment constraints
-  Representative acceptance cases

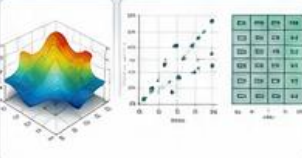
SCOPE BOUNDARIES

-  Prototype scripts, project utilities and production-ready software are different delivery classes, GUI, packaging, deployment, security hardening, support and long-term maintenance must be explicitly scoped.
-  External software/API integration depends on available interfaces, licences, access permissions and the client environment.
-  New functionality, changed file formats, additional integrations or expanded user requirements after scope approval are treated as scope changes.

REPRESENTATIVE TECHNICAL FOUNDATION

```

import numpy as np
import pandas as pd
from scipy import optimize
from matplotlib import pyplot as plt
  
```



AriyaTech combines engineering-domain knowledge with Python/MATLAB scientific computing, numerical methods, simulation automation, data processing and custom computational workflow development, with emphasis on engineering correctness and reproducibility.

START A TECHNICAL CONVERSATION



Describe the current workflow, representative inputs/outputs and the result you want automated. AriyaTech can assess the requirements and, where suitable, provide a clearly scoped automation proposal.