



ARIYATECH

AI ENGINEERING

COMPANY PROFILE

Advanced Computational Engineering
for Reliable Technical Decisions

Computational Engineering &
Applied AI Consultancy



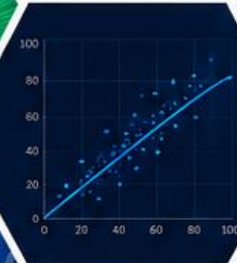
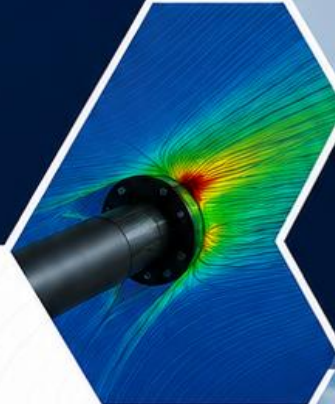
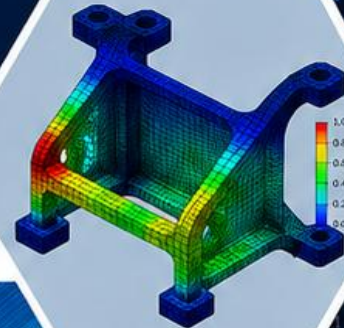
AriyaTech AI Engineering LLC



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```
1 import numpy as np
2
3 def solve_system(A, b):
4     x = np.linalg.solve(A, b)
5     return x
6
7 def post_process(results):
8     return results
9
10 results = solve_system(A, b)
11 processed = post_process(results)
12
13
```

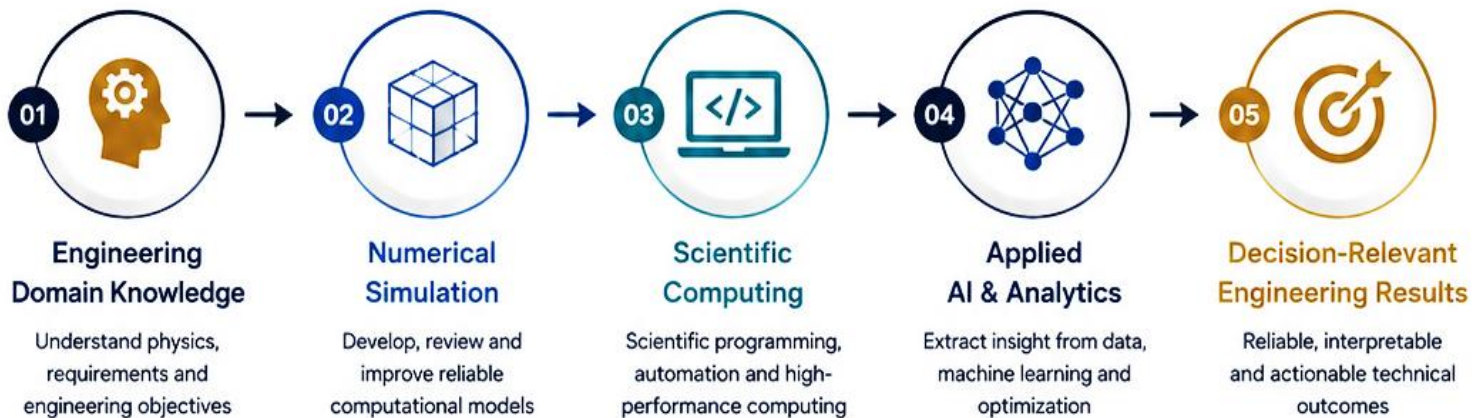


About AriyaTech AI Engineering

AriyaTech AI Engineering LLC is a specialist engineering consultancy focused on computational engineering and applied AI. We support engineering companies, technical startups, research teams, independent consultants and technical professionals through numerical simulation, scientific computing, engineering automation, data analytics and computational R&D. By combining engineering domain knowledge with numerical methods, scientific programming and applied machine learning, we help clients address technically demanding problems through structured, reproducible and decision-oriented computational workflows.

Our engineering-first approach places physical behaviour, modelling assumptions, numerical reliability and technical interpretation ahead of software output alone. Depending on the assignment, AriyaTech can independently review an existing model, develop a new numerical analysis, automate a computational workflow, extract engineering insight from technical data, or strengthen a complex R&D methodology.

Our Approach



Who We Support



Engineering Companies & Technical Startups

Specialist computational capability, overflow capacity, model review and project-based engineering support without the need to maintain every capability in-house.



Research Teams & Organizations

Advanced computational methodology, modelling, verification and validation, scientific computing and reproducible workflows for technically demanding R&D.



Independent Engineers & Consultants

Confidential specialist support, simulation review, overflow analysis and project-specific computational delivery.



Researchers & Technical Professionals

Focused computational support for modelling, scientific programming, engineering data analysis, validation and methodology development.



Working Philosophy

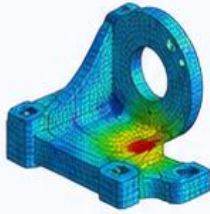
AriyaTech operates as a lean specialist technical partner, supporting focused technical tasks, complete computational projects and ongoing engineering collaboration. Every engagement is built around clear scope, transparent assumptions, reproducible workflows and technically defensible deliverables.

CORE SERVICES — THREE INTEGRATED PILLARS

AriyaTech integrates three complementary service pillars across the computational engineering workflow—from physics-based modelling and scientific computing to data-driven methods and technical R&D.

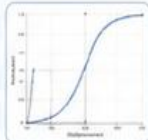
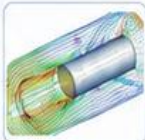
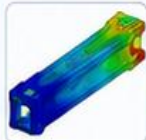
01

ENGINEERING SIMULATION



Numerical modelling and simulation for engineering assessment, troubleshooting, validation and research.

- Finite Element Analysis (FEA)
- Computational Fluid Dynamics (CFD)
- Nonlinear Analysis
- Structural Response
- Fracture & Fatigue Assessment
- Thermal & Fluid Analysis
- Parametric Studies
- Verification & Validation



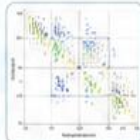
02

SCIENTIFIC COMPUTING & APPLIED AI



Scientific programming, engineering automation and applied AI for efficient, reproducible and data-informed technical workflows.

- Scientific Programming & Numerical Computing
- Engineering Automation
- Batch Processing & Post-Processing
- Engineering Data Analytics
- Machine Learning
- Surrogate Modelling
- Optimization
- Explainable & Physics-Aware AI



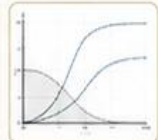
03

TECHNICAL R&D CONSULTING



Computational R&D support for methodology development, validation, independent technical review and complex engineering investigations.

- Computational Methodology
- Model Strategy
- Verification & Validation Planning
- Independent Technical Review
- R&D Workflow Development
- Computational Decision Support
- Research-to-Engineering Translation



INTEGRATED DELIVERY

The three pillars can operate independently or as an integrated workflow. A simulation model can be developed or reviewed, its computational workflow automated, its outputs analyzed using data-driven methods, and the complete methodology validated and documented within a single technical engagement.



Model / Problem Definition

Physics • Geometry • BCs
Material • Assumptions



Engineering Simulation

FEA • CFD • Nonlinear
Analysis • Studies



Data & Automation

Automation • HPC •
Data Management



Data-Driven Methods & Applied AI

Analytics • ML • Surrogates
Optimization



R&D & Validation Documentation

V&V • Review • Interpretation
Reports • Recommendations

RELIABLE • REPRODUCIBLE • DECISION-RELEVANT ENGINEERING RESULTS

WHAT CLIENTS RECEIVE



Defined Scope

Clearly defined technical scope and agreed deliverables.



Transparency

Transparent assumptions, methodology and limitations.



Quality Checks

Appropriate numerical and engineering quality checks.



Reproducibility

Reproducible models, code or computational workflows where included in scope.



Actionable Results

Decision-relevant results with technical interpretation.



Documentation

Concise technical documentation and agreed clarification support.

HOW WE CAN SUPPORT YOU – FIVE CORE SERVICES

From physics-based modelling to automation, data-driven methods and technical R&D, our five core services cover the entire computational engineering workflow.

01

Engineering Simulation Audit & Model Review



Independent technical review of an existing engineering model to identify physical, modelling and numerical weaknesses and improve confidence in the resulting analysis.

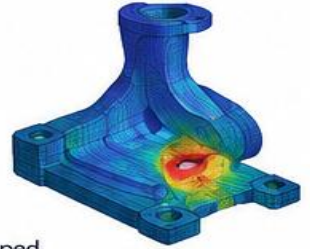


BEST FOR

Questionable results • Convergence problems
Uncertain boundary conditions • Validation gaps
Independent technical second opinion

02

Engineering Simulation Solutions



Custom numerical simulation developed or extended to answer a defined engineering question with documented, technically defensible results.



BEST FOR

New analyses • Nonlinear response
Fracture & fatigue • CFD • Validation
Parametric studies • Specialist capacity

03

Scientific Python & Engineering Automation



Custom scientific programming and automation that turns repetitive engineering analysis into efficient, reproducible computational workflows.



BEST FOR

Repetitive calculations • Batch simulation
Automated post-processing • Data transformation
Custom computational tools

04

Engineering Data Analytics & Applied AI



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



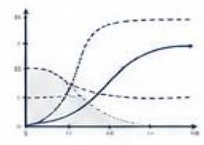
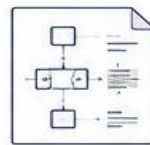
BEST FOR

Simulation, experimental or operational data
Predictive modelling • Model comparison
Surrogate modelling • Optimization
Interpretable / physics-aware AI

05

Technical R&D Consulting

Focused computational R&D support for methodology, validation, independent review and technically complex research or engineering decisions.



BEST FOR

Methodology design • Validation strategy
Computational workflow development • Independent review
Complex R&D decisions • Research-to-engineering translation



ENGAGEMENT PRINCIPLE

An engagement can begin with a focused audit, consultation or technical task and expand when additional engineering value is identified. Scope, deliverables, schedule and commercial terms are defined according to the requirements of each engagement.



START
FOCUSED



DELIVER
VALUE



BUILD
TRUST



SCALE
TOGETHER

TYPICAL CHALLENGES WE HELP SOLVE

AriyaTech supports clients facing technically demanding modelling, simulation, automation, data and computational R&D challenges. Typical situations include:

01

SIMULATION RELIABILITY



- Unstable, inconsistent or difficult-to-explain simulation results
- Convergence, stability or modelling issues
- Mesh/discretization and boundary-condition concerns
- Need for an independent technical model review
- Verification, validation or sensitivity requirements
- Existing models requiring correction, extension or refinement

02

ENGINEERING WORKFLOW EFFICIENCY



- Repetitive or time-consuming engineering calculations
- Manual, inconsistent or error-prone post-processing
- Large simulation batches requiring automated execution
- Disconnected analysis and data-processing steps
- Need for custom scientific scripts or computational tools
- Need for a reproducible end-to-end engineering workflow

03

ENGINEERING DATA & APPLIED AI



- Technical data are available but not yet simulation into actionable insight
- Predictive modelling is required for engineering decision support
- Need for surrogate modelling or optimization
- Multiple models or approaches must be compared and selected
- Interpretability or physics-aware insight is required
- Simulation, experimental or operational data need to be integrated within a consistent analytical workflow

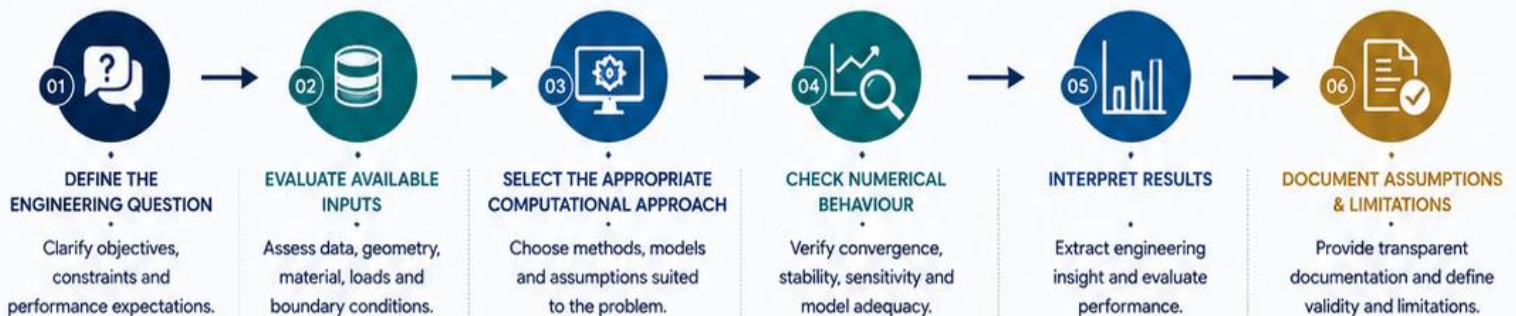
04

COMPUTATIONAL R&D



- Computational methodology is unclear, incomplete or difficult to defend
- Verification and validation strategy requires strengthening
- Complex numerical workflows need clearer structure and integration
- Independent technical judgement is required for modelling decisions
- Computational evidence needs to support a complex engineering or R&D decision
- Research-grade methods need to be translated into practical, reproducible engineering workflows

FROM TECHNICAL QUESTION TO DEFENSIBLE RESULT



DEFENSIBLE, TRUSTED & DECISION-RELEVANT ENGINEERING RESULTS

Clear reasoning • Technical rigor • Reproducible workflow • Confident decisions

WHY WORK WITH ARIYATECH

We combine engineering judgement, advanced computational methods and scientific rigor to deliver reliable, interpretable and decision-relevant results.

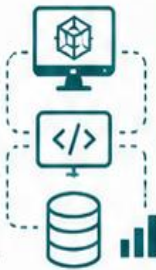
01 ENGINEERING-FIRST REASONING

Models, code and AI outputs are evaluated against physical behaviour, engineering objectives and the technical decisions they are intended to support.



02 INTEGRATED COMPUTATIONAL CAPABILITY

Simulation, scientific programming, automation, data processing and applied AI can be integrated within one coherent technical workflow, reducing fragmentation across complex projects.



03 TECHNICAL RIGOR & REPRODUCIBILITY

Verification, validation, transparent assumptions, reproducible workflows and documented limitations are used to strengthen the reliability, traceability and technical defensibility of results.



04 RESEARCH-TO-ENGINEERING TRANSLATION

Advanced computational and research methods are translated into practical, reproducible workflows structured for engineering application and technical decision-making.



05 FLEXIBLE SPECIALIST SUPPORT

Clients can engage AriyaTech for a focused technical task, a defined project or ongoing specialist support—accessing advanced computational capability without maintaining every specialist discipline in-house.



OUR QUALITY PRINCIPLES



PHYSICS BEFORE COMPLEXITY

Physical plausibility and correct problem definition take priority over unnecessary numerical complexity.



NUMERICAL ADEQUACY

Mesh/discretization, convergence, stability and sensitivity are checked as appropriate to the analysis.



VERIFICATION & VALIDATION

Relevant verification and validation evidence is incorporated where scope and available data permit.



TRANSPARENCY

Assumptions, limitations and relevant sources of uncertainty are documented clearly.



ENGINEERING INTERPRETATION

Solver, code and AI outputs are interpreted within their physical and engineering context.



REPRODUCIBILITY

Models, code, workflows and documentation are structured for reproducibility where included in scope.



TECHNICALLY DEFENSIBLE ENGINEERING DELIVERY

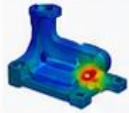
Reliable Results | Clear Insight | Reproducible Workflows | Confident Decisions

CAPABILITIES & APPLICATION AREAS

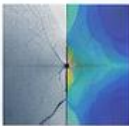
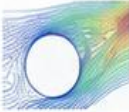
AriyaTech combines numerical engineering, scientific computing and applied AI capabilities across selected engineering and computational R&D domains. Methods and tools are selected according to the physics, data and technical objectives of each project.



NUMERICAL & COMPUTATIONAL ENGINEERING



- Finite Element Analysis (FEA)
- Computational Fluid Dynamics (CFD)
- Nonlinear Analysis
- Structural Response Analysis
- Fracture & Fatigue Assessment
- Thermal & Thermomechanical Analysis
- Parametric & Sensitivity Studies
- Verification & Validation
- Numerical Model Assessment



SCIENTIFIC COMPUTING



- Numerical Methods & Engineering Computation
- Scientific Programming
- Engineering Calculations
- Data Processing & Transformation
- Batch Processing
- Simulation Automation
- Automated Post-Processing
- Custom Computational Tools
- Reproducible Computational Workflows



APPLIED AI FOR ENGINEERING



- Machine Learning
- Deep Learning, Where Appropriate
- Engineering Data Analytics
- Predictive Modelling
- Surrogate Modelling
- Model Comparison & Selection
- Optimization
- Explainable AI
- Physics-Aware Interpretation



REPRESENTATIVE COMPUTATIONAL TOOLS & PLATFORMS



Python



MATLAB



ABAQUS



ANSYS



OpenSees



FLOW-3D



ANSYS Fluent



OrcaFlex



ANSYS AQWA



XBeach



Tool and platform selection is project-dependent and guided by the engineering problem, required methodology and delivery objectives. **Software supports the totality of the technical solution; it does not define it.**

APPLICATION AREAS



CIVIL & STRUCTURAL ENGINEERING

Structural analysis, nonlinear response, fracture and fatigue, and related computational assessment of engineering systems and components.



OFFSHORE & MARINE ENGINEERING

Structural, hydrodynamic and wave-structure interaction applications for offshore and marine engineering systems.



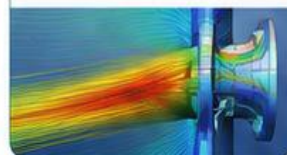
ENERGY & INDUSTRIAL SYSTEMS

Simulation, computational assessment, engineering data analysis and technical workflows for energy and industrial systems.



FLUID & THERMAL SYSTEMS

Fluid-flow, thermal, thermomechanical and related coupled computational engineering problems.



COMPUTATIONAL ENGINEERING R&D

Methodology development, advanced numerical workflows, scientific computing, applied AI, verification and technical validation for engineering R&D.



CAPABILITY RULE

The engineering problem—not a predetermined software package—drives the selection of methods and computational tools. Each project-specific proposal defines the modelling approach, computational platform, verification and validation strategy, scope and deliverables appropriate to the assignment.



TECHNICAL EXPERIENCE & ENGINEERING LEADERSHIP



AriyaTech AI Engineering is built on a strong foundation of **multidisciplinary engineering projects**, collaborative research activities and specialist computational work developed through an established **technical and research team**.



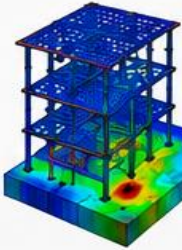
The company combines this **team-based technical experience** with dedicated **engineering leadership**, enabling complex assignments to be approached through the appropriate combination of domain expertise, computational methods and project-specific technical resources. This structure supports both focused specialist tasks and multidisciplinary computational projects while maintaining consistency in methodology, technical review and delivery quality.

REPRESENTATIVE TECHNICAL EXPERIENCE

01 NONLINEAR & STRUCTURAL SIMULATION



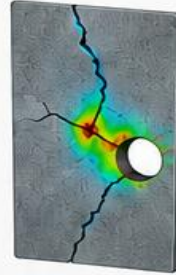
Finite-element modelling, nonlinear structural response, parametric and sensitivity analysis, model verification and engineering interpretation of computational results.



02 FRACTURE & FATIGUE



Computational fracture mechanics, cracked-component analysis, fatigue-life modelling and numerical assessment of damage and crack progression.



03 OFFSHORE & MARINE COMPUTATIONAL ENGINEERING



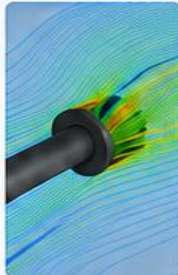
Structural, hydrodynamic and wave-structure interaction analysis for offshore and marine systems using numerical and computational engineering methods.



04 CFD & HYDRAULIC MODELLING



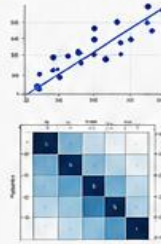
Computational fluid dynamics and hydraulic modelling for engineering flow problems, including numerical simulation, model assessment and interpretation of flow behaviour.



05 ENGINEERING AI & DATA ANALYTICS



Engineering-focused machine learning and data analytics for prediction, classification, surrogate modelling, model comparison and interpretable technical decision support.



06 SCIENTIFIC COMPUTING & NUMERICAL METHODS



Scientific programming, numerical methods, computational automation, engineering data processing and development of custom reproducible workflows and tools.

```
1. import numpy as np
2. import pandas as pd
3.
4.
5. def solve_system(A, b):
6.     x = np.linalg.solve(A, b)
7.     return x
8.
9.
10.
11. # post-processing
12. results = analyze()
13.
14.
15.
```



COLLABORATIVE TECHNICAL FOUNDATION

AriyaTech's technical foundation extends beyond individual expertise. It draws on experience developed through collaborative engineering projects, research activities and multidisciplinary technical work involving numerical modelling, computational methods, scientific programming and applied AI. This collaborative background enables project requirements to be addressed through complementary technical expertise rather than a single-discipline perspective.



TECHNICAL LEADERSHIP



Dr. Shahriyar Shemshaki

Founder & Lead Computational Engineering Consultant

Technical leadership across computational engineering, advanced numerical simulation, scientific computing, applied AI and engineering R&D.

The Founder provides direct oversight of computational strategy, methodology development and technical quality, while drawing on multidisciplinary research and engineering collaboration according to project requirements.



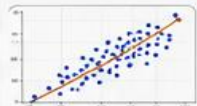
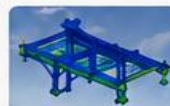
This combination of collaborative technical capability and direct engineering leadership provides clients with both **specialist depth** and **clear technical accountability** throughout the project lifecycle.

EVIDENCE & CASE STUDIES



Representative technical evidence is documented through selected case studies, computational results, numerical models and project visuals where confidentiality and usage permissions allow.

A dedicated Commercial Engineering Portfolio presents selected examples of technical capabilities and prior project experience, with the relationship between historical experience and AriyaTech-delivered work identified appropriately.



Commercial Engineering Portfolio

Detailed case studies, results and technical visuals available upon request.



Physics-based approach



Technical rigor & quality



Collaborative expertise



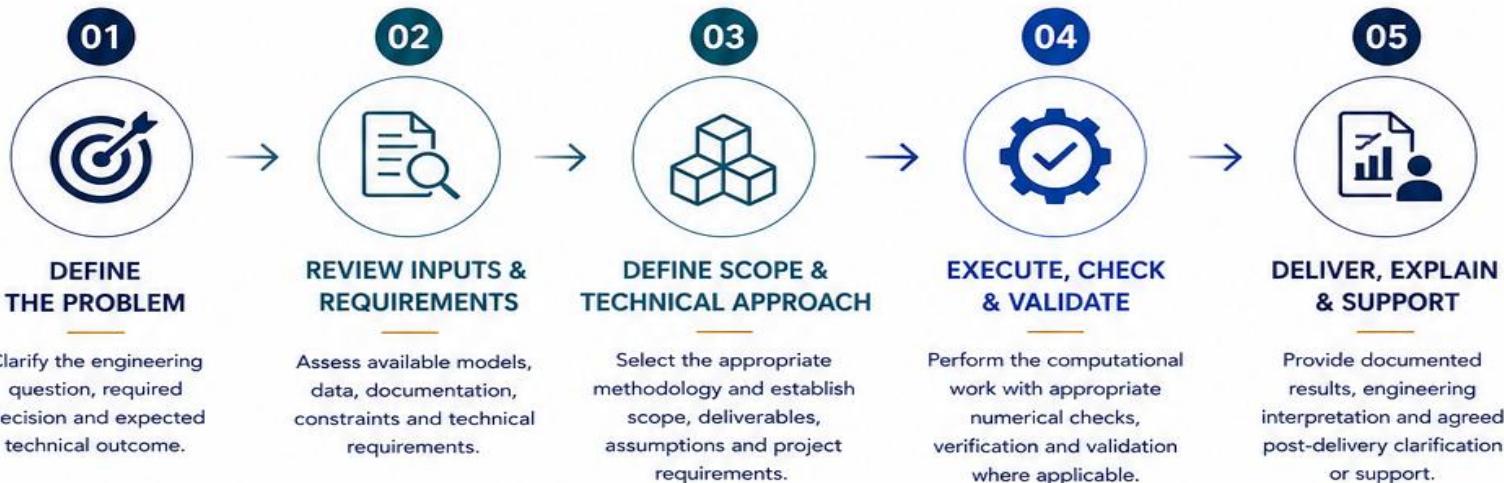
Confidentiality & integrity



Value-driven engineering

OUR COMMITMENT

HOW WE WORK



Every engagement starts with the engineering question and the decision or output it must support. AriyaTech then evaluates the available inputs, defines an appropriate technical approach and project scope, executes the work with relevant engineering and numerical checks, and delivers documented results with clear technical interpretation.

ENGAGEMENT MODELS



FOCUSED TECHNICAL TASK

Audit, consultation, custom script, model review or tightly defined technical analysis.



FIXED-SCOPE PROJECT

Clearly defined technical objectives, deliverables, milestones and acceptance criteria.



CUSTOM ENGINEERING PROJECT

Advanced or multidisciplinary computational work requiring a project-specific methodology and delivery structure.



ONGOING TECHNICAL SUPPORT

Recurring analysis, model development, computational automation or specialist technical support for established client requirements.



START A TECHNICAL CONVERSATION

Have a simulation, engineering data or computational R&D challenge?

Share your technical problem, existing model, engineering data or project requirements for an initial review. AriyaTech can assess the challenge, identify an appropriate next step and, where suitable, prepare a scoped technical proposal covering the recommended approach, deliverables, schedule and commercial terms.



CONTACT



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COMPANY INFORMATION



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