Aegis-6 Framework: A Causal and Strategic Guide to Machine Learning Design

Named after the Aegis, the mythic shield of Athena: a symbol of protection, and strategic foresight.

The Aegis-6 Framework is a symbolic and practical model for structuring decision-making in the design and deployment of machine learning systems.

- Drawing from both classical Greek philosophy and modern AI development principles, it maps six essential stages of the ML workflow to the structure of Aristotle's Four Causes and Greek symbolism.

- The aim is to first assist myself in systems thinking for ML, integrating my passion for Aristotle's Four Causes and Ancient Greek Symbolism. My hope is that it can also help equip data scientists, engineers, and decision-makers with a shield against confusion, overfitting, and conceptual drift.

Developed by Blake Zenuni with support from ChatGPT 4o for structure, organization, and research references.

A (Alpha) — Objective Clarity

"First cause: Know what you seek."

- Define the problem.
- Are you classifying, predicting, recommending, or ranking?
- A model without a clear goal is architecture without purpose.
- The clarity of this first step shapes all that follows.

B (Beta) — Data Type Recognition

"Form without substance is noise."

- Identify the nature of your data: structured tables, unstructured text, sensor time-series, or mixed inputs.
- Acknowledging the material properties of your data helps select the right learning method and preprocessing techniques.

Γ (Gamma) — Method Alignment

"A method must fit its material."

- Choose the learning approach appropriate to your problem and data: supervised, unsupervised, reinforcement, or self-supervised.
- Each method speaks a different dialect of inference.

Δ (Delta) — Trade-off Evaluation

"All models are compromises."

- Bias vs. variance.
- Simplicity vs. performance.
- Accuracy vs. interpretability.
- This is the site of judgment. Trade-offs must be acknowledged early and managed iteratively.

E (Epsilon) — Architectural Fit

"The engine must suit the terrain."

- Choose a model class with intent: linear model, tree-based ensemble, neural network, probabilistic graphical model.
- Match infrastructure and scalability needs.
- Consider the costs of training, deployment, and latency.

Z (Zeta) — Metric Discipline

"You become what you measure."

- Select your evaluation metrics wisely: precision, recall, F1-score, ROC-AUC, RMSE, BLEU, etc.
- Metrics are not neutral. They incentivise behaviour in both models and teams.

Aegis-6 Mind Map (ASCII Representation)

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     [A] Objective Clarity
              ↓
  [B] Data Type Recognition
              ↓
     [Γ] Method Alignment
              ↓
  [Δ] Trade-off Evaluation
              ↓
     [E] Architectural Fit
              ↓
     [Z] Metric Discipline
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Use Case Reflection

The Aegis-6 Framework has been applied to recommendation systems, reinforcement learning workflows, and hybrid models. It serves not just as a checklist but as a way of thinking: causal, strategic, and grounded in both technical precision and philosophical clarity.

In the tradition of Aristotle and the logic of modern AI, Aegis-6 reminds us: before we optimise, we must first understand.