

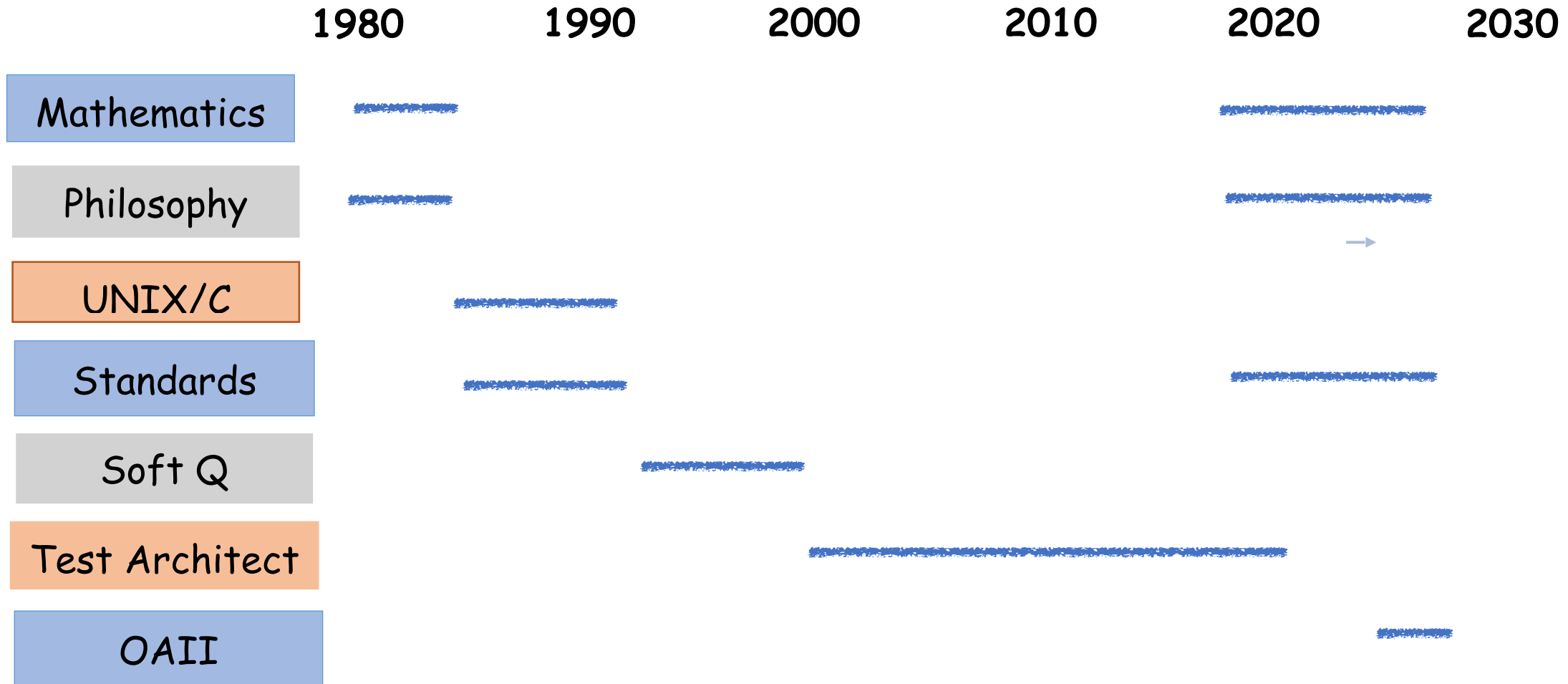
# Open Autonomous Intelligence Initiative LLC

Background, concepts, examples and next steps

Working Draft Version 080626

OAI is currently a sole member LLC. The advantages of being a sole member LLC are low cost, operational simplicity, and control in defining the example base model, conformant application(s) and bylaws for reforming as a public benefit corporation.

# BACKGROUND



# THE PROBLEMS OAII ADDRESSES

The internal structures of AI are difficult to understand, non-transparent, and have interfaces that are vendor and task specific. The current state of AI does not support public trust, certification, or interoperability.

## EXPLAINABILITY

The AI process including decision evidence, assumptions, alternatives, or policy constraints are not inspectable.

## VENDOR LOCK-IN

Devices, sensors, signals, models, logs, agents, policies, and interfaces typically evolve as vendor-specific processes, hindering interoperability.

## GOVERNANCE

Increasingly recognized in policy, legal, and ethics communities. Without standard objects and logs, it is hard to know what a system is - or is not - doing and why.

These problems are social, national and global.

Transparent, accountable, ethical, and interoperable AI needs certifiable structures.

# BASIC CONCEPTS

Inspired by the IEEE Ethically Aligned Design OAII is advocating for a way that AI systems should be modeled and designed: open enough to inspect, standard enough to certify, object-oriented enough to implement, and accountable enough to trust.

**OPEN:** Inspectable structures, explicit assumptions, transparent reasoning, reviewable logs.

**STANDARD:** Interoperable models, common interfaces, certification-friendly testing.

**OBJECT-ORIENTED:** The example base model mimics voice and data network management concepts and uses international standard notations.

**ETHICAL:** Models make things like human rights and well-being, data agency (privacy), effectiveness, transparency, accountability, awareness of misuse, and competence transparent.

# EXAMPLE

The Structural Intelligence Framework (SIF) and conformant application model autonomous intelligence (AuI) in terms of world-based structured relationships

Entities are expressed as well defined object classes

Signals are interpreted and acted on using location specific knowledge, agents, and policy.

Transformations are changes in state, relation, or condition.

Events are learned transformations.

Time is treated as an interpretive projection over structured transformation.

Knowledge entities represent stable contextual occurrences of policy and learned signal patterns.

Contextual policies guide interpretation, action, and logging

# OBJECT MODEL

Entity

Host

Sensor

Signal

Knowledge

Agent

Interface

Log

# CONFORMING APPLICATION ARCHITECTURE

## Regulation

Transformation

Event

Context

Time

Report

Log

## Entity

| Host      | Sensor   | Signal      | Knowledge  | Agent         | Interface | Log Level     |
|-----------|----------|-------------|------------|---------------|-----------|---------------|
| • ESP32   | • BLE    | • Presence  | • Location | • Event       | • API     | • Information |
| • Pi Zero | • USB    | • Image     | • Policy   | • Learning    | • Voice   | • Warning     |
| • Pi 5    | • WiFi   | • Vibration | • Routine  | • Recognition | • Text    | • Error       |
|           | • mmWave | • Motion    | • Event    | • Alert       | • Display | • Debug       |

# PERSONAL EVENT RECOGNITION (PER)

PER is the OAII AuI system approach for sensing, interpretation, and first-line response that occurs on local edge devices. It recognizes meaningful personal events from signals in context while keeping human-relevant decisions inspectable and policy-governed.

## FEASIBLE NOW

Affordable high-performance edge devices + small learning data sets enable local processing.

## OPEN-SOURCE MODELS

Speech/audio, vision, signal processing, and lightweight inference components are widely available.

## PRIVACY

Local processing reduces cloud exposure. Consent-aware policies control sensitive household data.

## INTEROPERABILITY

Shared classes and interfaces can integrate devices and software from multiple vendors.

PER has product potential — it can support aging-in-place and related personal assistance use cases with timely, context-aware responses. For now it serves as an example of an AuI based on the Structural Intelligence Framework.

# EXAMPLE USE CASE

The Primary User begins a normal morning routine: bed/sleep area → bathroom → kitchen → medication/ coffee/breakfast. While showering, a phone call, cell phone alert, or front door entry occurs, kitchen water is detected, shower water is constant, and the shower time alert threshold is reached.

**BATHROOM  
START**

**UNEXPECTED  
SIGNAL(S)**

**BATHROOM  
TIMEOUT**

**HYPOTHESIS**

**REGULATED  
ACTION**

**POSSIBLE OUTCOMES**

Non-primary user entry,  
Routine resumes normally,  
Routine is aborted,  
Potential distress

**WHY THIS IS HARD**

Another person, Interruption  
changes expected durations,  
Temporal order is not  
meaning

**LOG**

Signals, locations, time.  
Event and Policy  
references, Agent  
decisions and actions

The structure of change cannot be represented based on completion time or time order.

# APPENDIX A: OAI BASE CLASSES

# APPENDIX A: ENTITY

The Entity class serves as the foundational base class. It represents the abstract concept of "things" that can exist and have properties, behaviors, and relationships.

Attributes: ID, Name, State, Status, Location

Methods: get\_attribute, set\_attribute, to\_string, initialize, activate, suspend, terminate

Notifications: entityCreated, entityDeleted, entityDiscovered, entityStateChange, entityConfigUpdate, entityStatusChange, entityStateChange, entityAlarmRaised, entityAlarmCleared

As a base class, Entity provides a generic blueprint for all entities in the system. Its primary responsibility is to ensure that derived classes maintain consistent structure and behavior. Subclasses further refine and add to these attributes based on their specific roles.

A Host is a physical, virtual, or logical OAI Entity that provides a managed location for Sensors, Knowledge, Agents, Interfaces, Logs, or autonomous-intelligence processing.

## Sensors

provide power

- provide GPIO/I2C/SPI/UART/USB

## Personal Computer

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# CONCEPTUAL EVOLUTION

## OAII BASE MODEL

Entity, Device,  
Sensor, Signal,  
Knowledge,  
Agent, Log,  
Interface

## UNITY POLARITY AXIOMS (UPA)

Philosophy,  
Dualistic Monism  
Axioms, Theorems,  
Worlds

## AXIOMS OF INTELLIGIBILITY AND MIND (AIM)

Philosophy of Mind  
Phenomenal-Psychological  
Polarity, Covariance  
Clinical Psychology

## POLARITY MODELING FRAMEWORK (PMF)

Concept Papers:  
Knowledge, Process,  
Context,  
Transformation,  
Regulation, Worlds

### First Pivot: UPA to AIM

Clarified philosophical scope,  
De-emphasize theorems and  
geometry

### Second Pivot: AIM to PMF

Removed ontological scope  
Focus on Cognitive Science  
& Clinical Psychology

### Current (Last?) Pivot

Simplified PMF + OAII  
Structural Intelligence  
Framework  
Example-Focused

200+ posts published at [aisq.org](https://aisq.org)

# COMPREHENSIVE EXAMPLE

## NOT A MINIMUM VIABLE PRODUCT

A worked example that can demonstrate structural, accountable AuI.

## NOT NECESSARILY MINIMAL

Ambitious enough to show the value of open object-oriented models.

CONCEPT



FORMAL  
SPECIFICATIONS



EXAMPLE



OPEN  
SOURCE

## CREDIBILITY BASE

The work draws on development, systems engineering, QA, network management, protocols, standards, and LLM-assisted conceptualization.

## WHAT SUPPORT ADDS

Grassroots reviewers and builders can challenge assumptions, test interoperability, and make the public-benefit path plausible.

A rigorous example grounded in a published open source framework.

# WHAT IS A PUBLIC BENEFIT CORPORATION?

A Public Benefit Corporation is a for-profit legal structure that allows a company to pursue both financial returns and a specific public benefit. In simple terms, a PBC is a hybrid between a traditional for-profit company and a nonprofit. It makes money like any other business, but it also commits to having a positive impact on society, the environment, or both

## Purpose

Develop open, accountable, privacy-preserving AI systems that serve individuals and communities, with a priority commitment to populations underserved or displaced by commercial AI and robotics.