
numalis
The no-guess company

We are numalis

Trustworthy company you can rely on

French Deeptech founded in 2015

- 23 FTE with ¾ of engineers and PhD
- 10 innovation awards
- Editor of the static analyzer for AI: Saimple®

Experts in formal methods

- More than 2 decades of R&D
- More than 40 published scientific articles

Experts in AI standardization

- Active member of standardization bodies: ISO/IEC, CEN-CENELEC, AFNOR…
- Major contributor to ISO/IEC 24029 series on robustness assessment of AI systems

High-level experts team

- Standardization expert
- R&D team expanding the state of the art
- Scale up technology team
- Industrialization team
- Use case support team

We Believe

That AI has numerous applications that can benefit the most, but it's facing **trust** challenges **preventing** its **adoption**…

In critical applications, "probably" safe is unacceptable

Our Mission

Help industry streamline the development and confident adoption of trustworthy & regulatory compliant AI systems

To do so Numalis endorses two key roles:

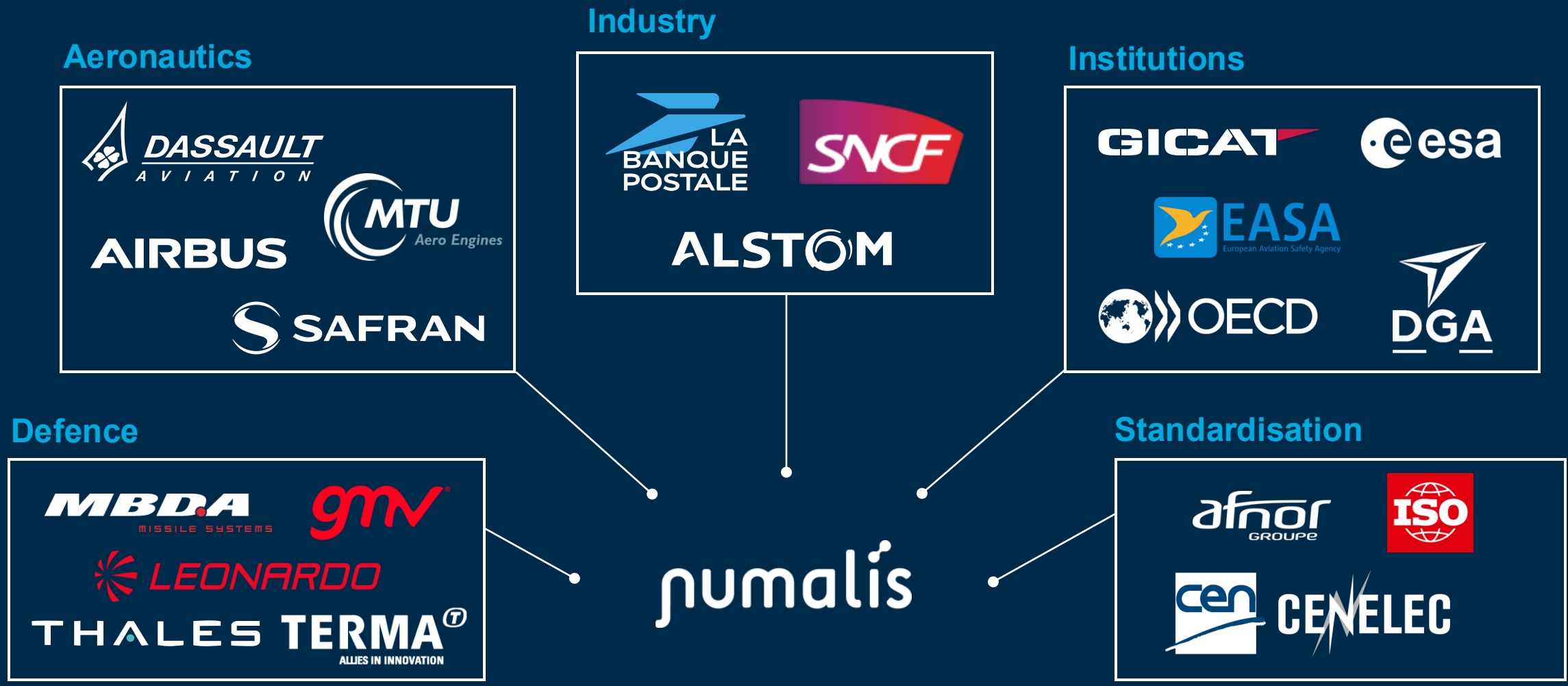
Establishing rigorous framework described in international standards on AI

Products and services to control the risk using validation tools and proper skill management

AI validation software

AI Competence Certification

Our Partners and Clients



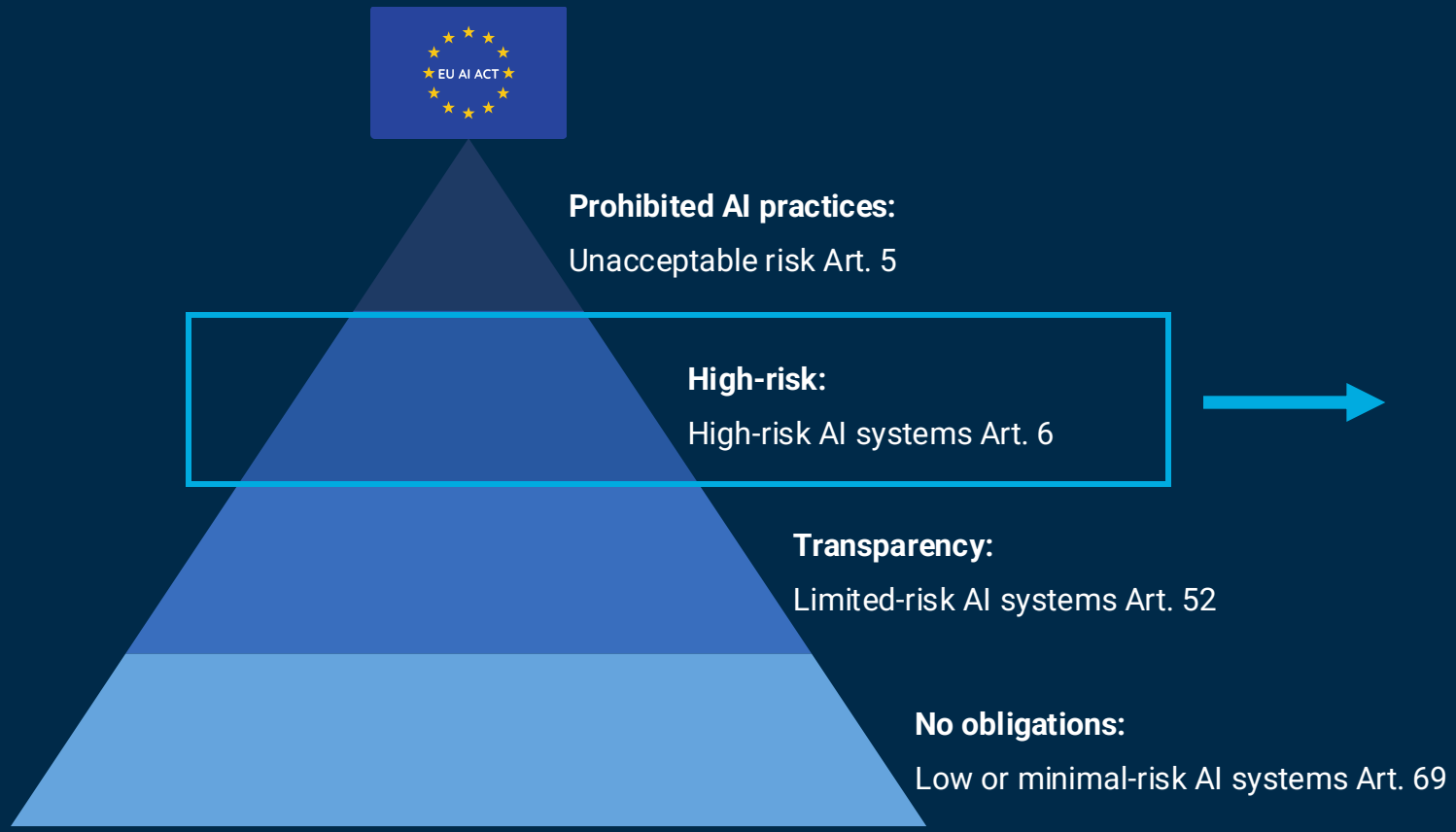
High-Level Structuring Projects

Prime	Name	Objective
EASA European Aviation Safety Agency	MLEAP	Applicability of the EASA guideline for certification of AI avionic models
European Commission	NoLeFa	Developing the framework for notified bodies regarding the AI Act
LEONARDO	JEY CUAS	Specification of anti-drone systems
TERMA ALLIES IN INNOVATION	AI4DEF	Methodology and tool for an AI for Defence platform
gmv	CONVOY & GENIUS	Detection & neutralization of IED
SNCF	TELLi	Self piloting trains
esa	AITIVE	Validation of embedded AI system for space exploration

More at https://numalis.com/projects/

Standardization &
EU Regulatory Landscape

The EU AI Act, a Risk Based Approach



Trustworthy AI
Source: HLEG, EU

Key Challenges we Address

We help prove AI model readiness for real world applications

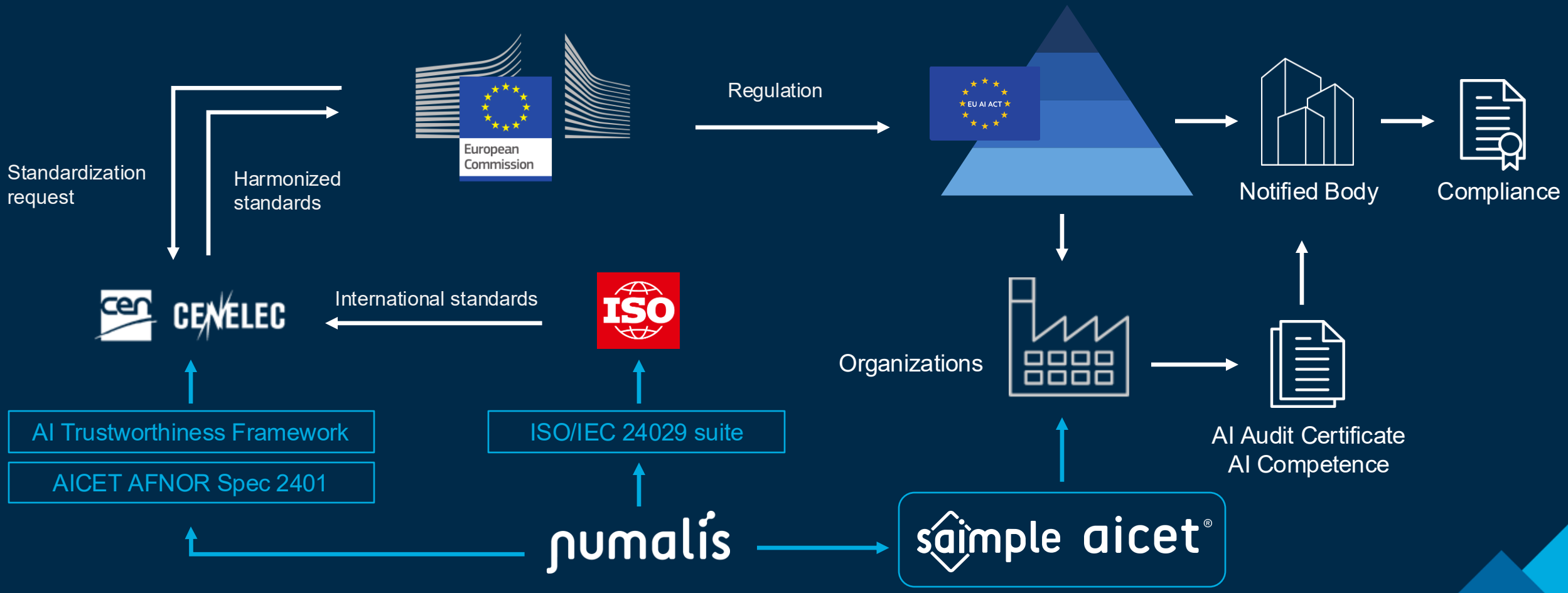
Using state-of-the-art techniques described in the standards, based on formal methods and abstract interpretation, we help demonstrate model ability to maintain stable decisions despite perturbations on inputs.

We help explain AI model decisions in human-understandable way

We help demonstrate model's trustworthiness through formal proof, ensuring transparency and accountability. By explaining how models function and make decisions, we enable to build trust, detect biases, and comply with regulations, improving both user confidence and system reliability.

EU AI Act mechanics

The regulation is implemented through harmonized standards produced by CEN and CENELEC using ISO documents. For robustness, the Trustworthiness Framework lays out the requirements and refers to the ISO/IEC 24029 standards, which Saimple ensures compliance with.



Set of Tools for Achieving Trustworthy AI Models

Neural Network Explainability and Robustness Validation Solutions

Robustness' standards and saimple

Requirements

CEN CENELEC Trustworthiness Framework

- Defining domain of use
- Rare events
- Perturbations
- Conform to 24029 series

Conformity

Assessment

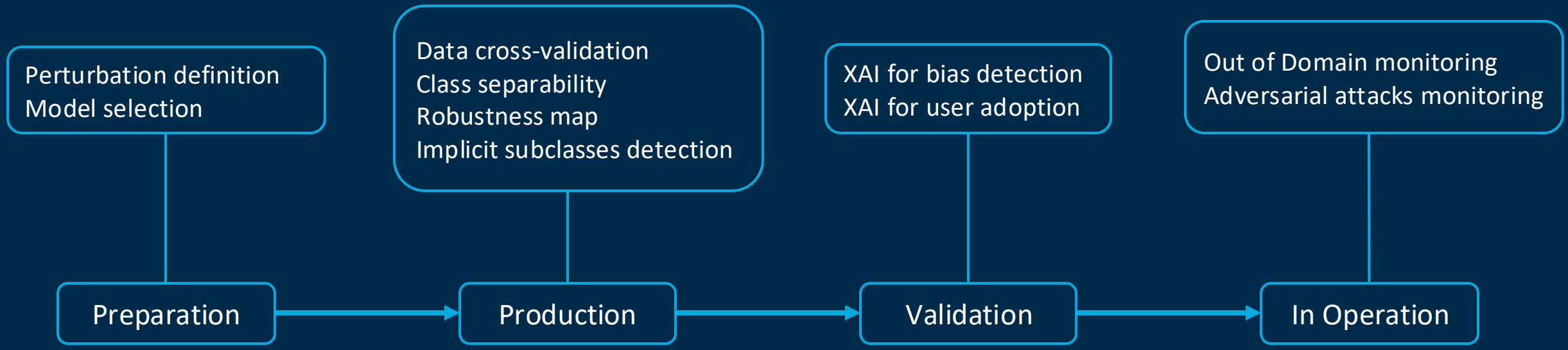
ISO/IEC 24029 series

- Measuring stability / sensitivity
- Relevance (XAI)
- Defining custom noises
- Covering the domain of use

saimple

Audit Report

Lifecycle-Based Verification Framework for Trustworthy AI Systems



saimple main features

Preparing

Applications :
Domain specification
Custom perturbation
Training and support

Use :
Expert at your disposal
Fully scriptable tool

Evaluating

Applications :
Understand the model behavior
Identify bias
Visualize input space robustness

Use :
CI/CD integration
Full automation

Correcting

Applications :
Detect unbalanced robustness
Identify errors in the training set
XAI to adjust your training set
Guide your data augmentation

Use :
Before/After comparison
Trigger correction request

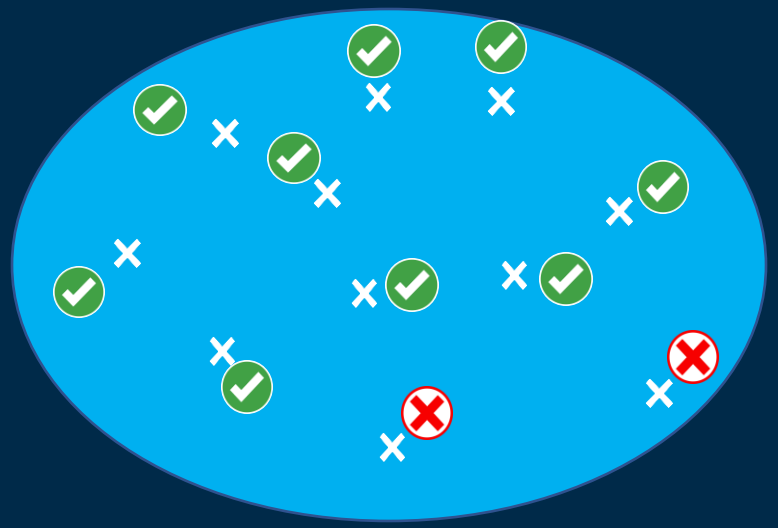
Documenting

Applications :
Document testing procedure
Validation process progress
Impact of correcting actions

Use :
Report generation
Dashboard visualization
Requirements traceability

Using saimple in your existing process

Statistical methods



saimple

Formal methods

TESTING

- Accuracy
- Recall
- F1-score
- AUC
- …

Existing metrics

Audit Report

PROVING

Robustness

- Stability
- Sensitivity
- Reachability

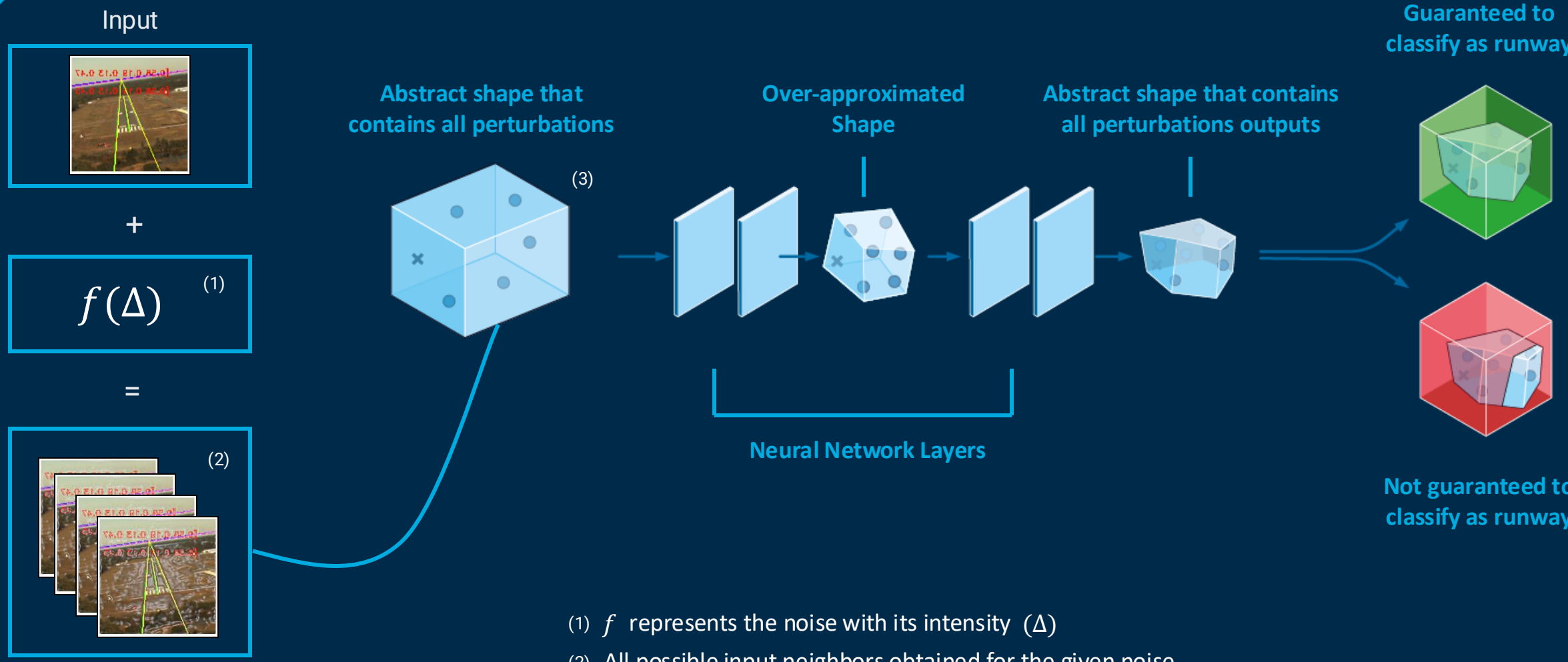
XAI

- Relevance

New metrics

Model Robustness Validation Principle

Based on ISO/IEC 24029-2

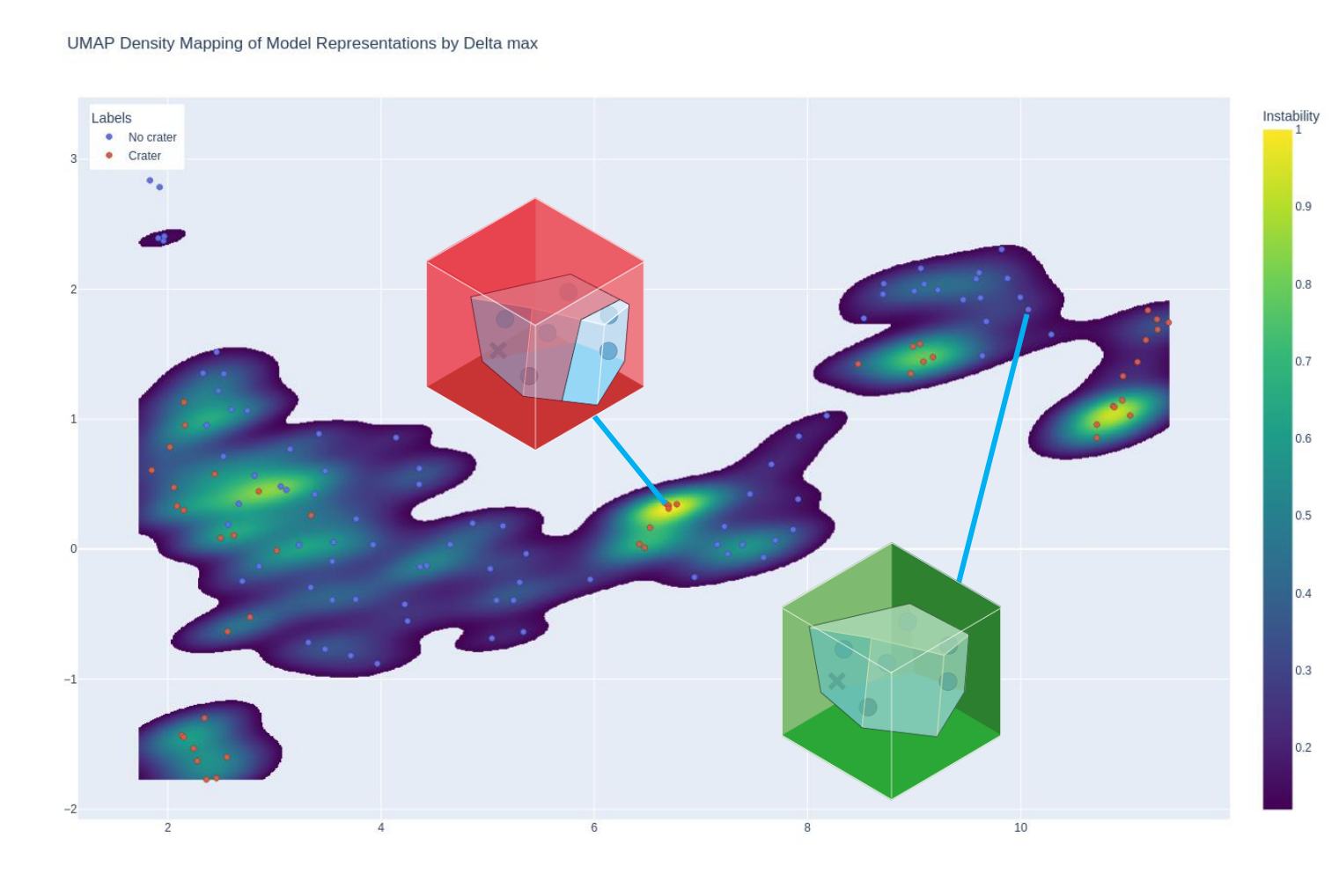


(1) f represents the noise with its intensity (Δ)

(2) All possible input neighbors obtained for the given noise

(3) Mathematical object containing all possibilities

Robustness Map Visualization

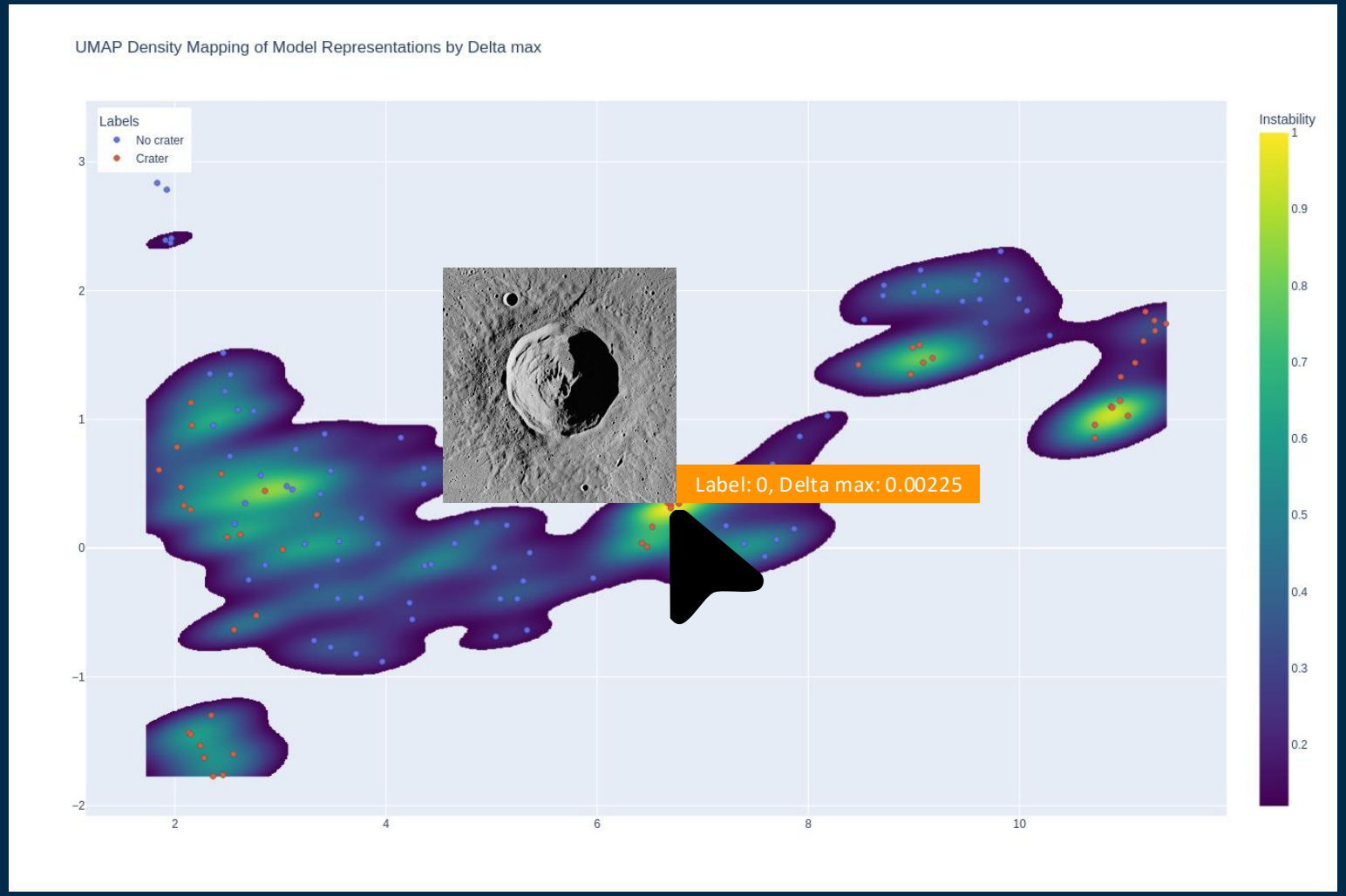


Feature

The robustness map visualization allows users to quickly identify robust and weak areas across the input domain for each data point from the validation dataset.

The more yellow a cluster is, the more unstable its data points; the more blue it is, the more stable they are.

Robustness Map Visualization

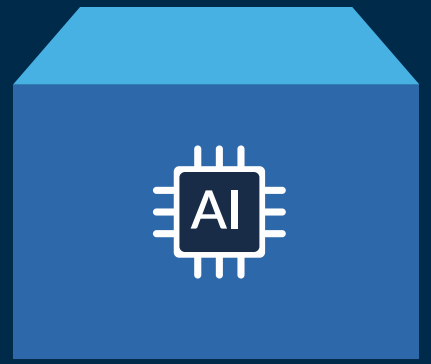


Feature

Get valuable insights to guide improvement efforts by inspecting each data point with relevant information

Explainability (XAI) Feature

Move from opaque decisions



Aircraft

🤷 Why?

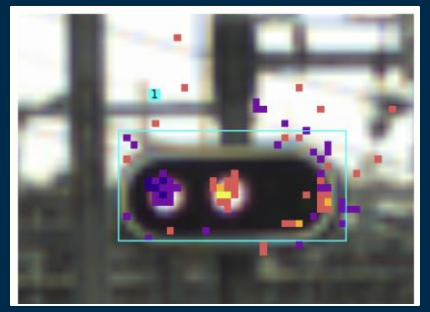
To explainable decisions

Saimple helps you validate your model decisions through human-understandable visualizations

Aircraft

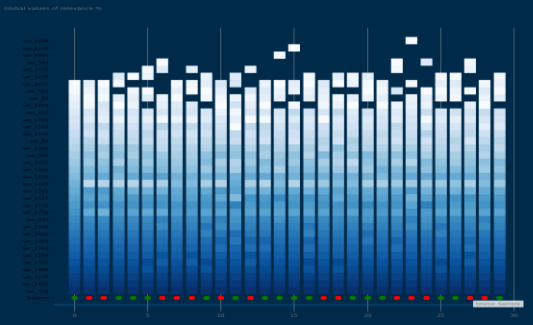
👍 OK!

Applicability of our Technology



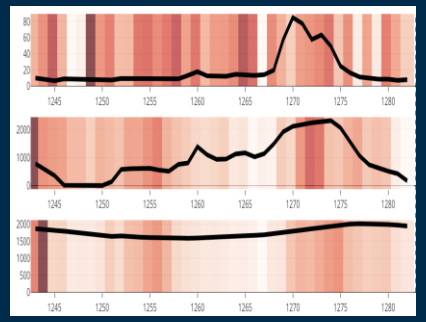
Computer vision

- Classification
- Detection
- Segmentation
- Industrial quality check



Tabular Data

- Scoring / Finance
- Pattern identification
- High level XAI



Time Series

- Predictive maintenance
- Anomaly detection
- Acoustic overwatch
- Medical diagnostic

NLP (on going R&D)

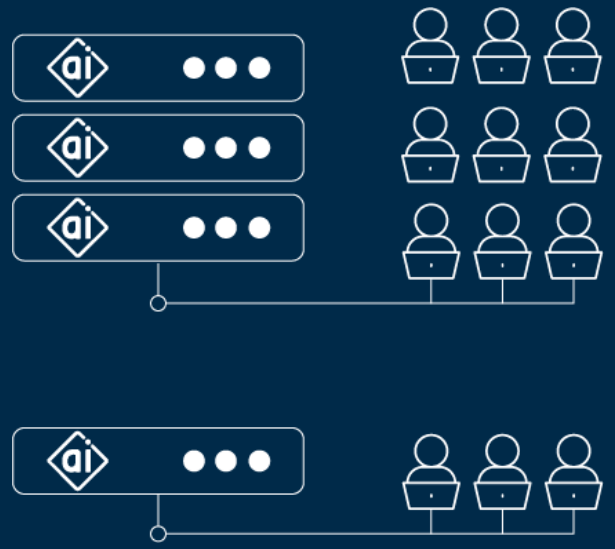
- Conversational AI
- Speech to text
- Report summary

Supported models

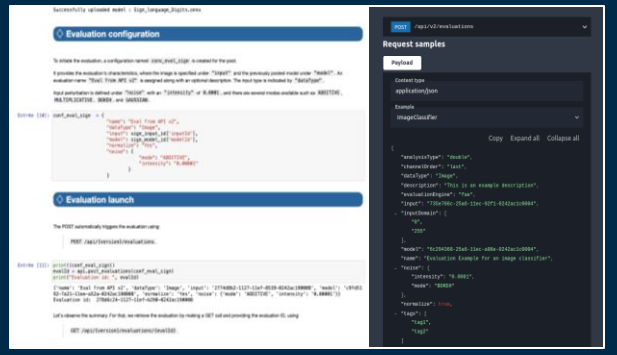
- Neural Networks (Convolutional, Recurrent, Residual, Detectors)
- Support Vector Machine, random forest, decision trees

A Versatile Solution

Highly scalable solution available on-premise or secured HPC SaaS

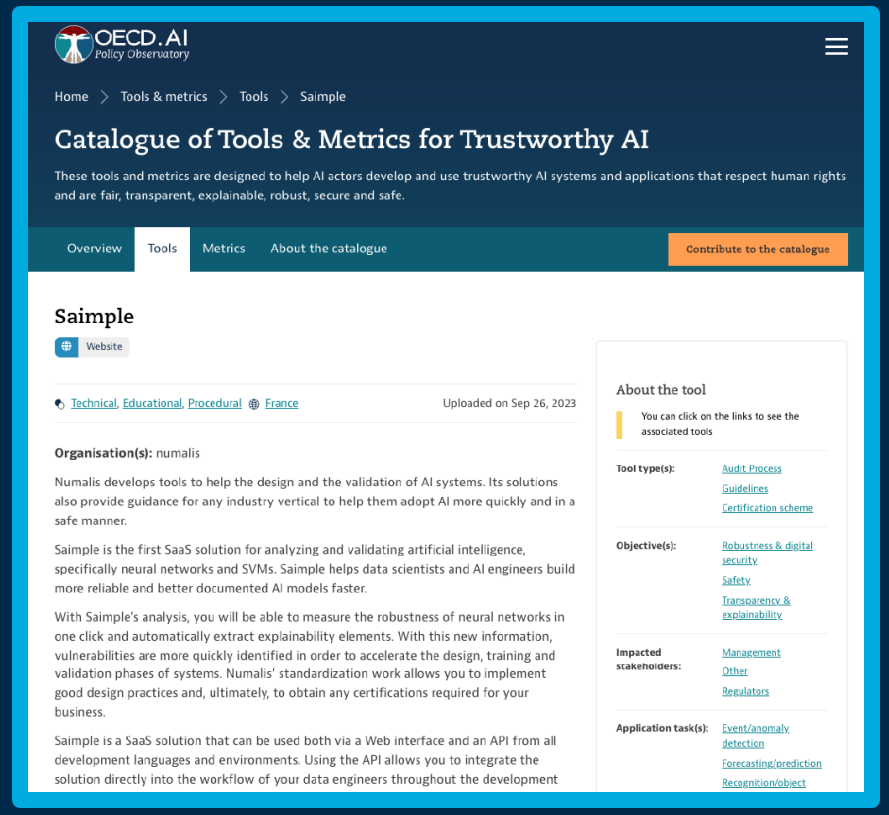


Comprehensive & easy to use GUI

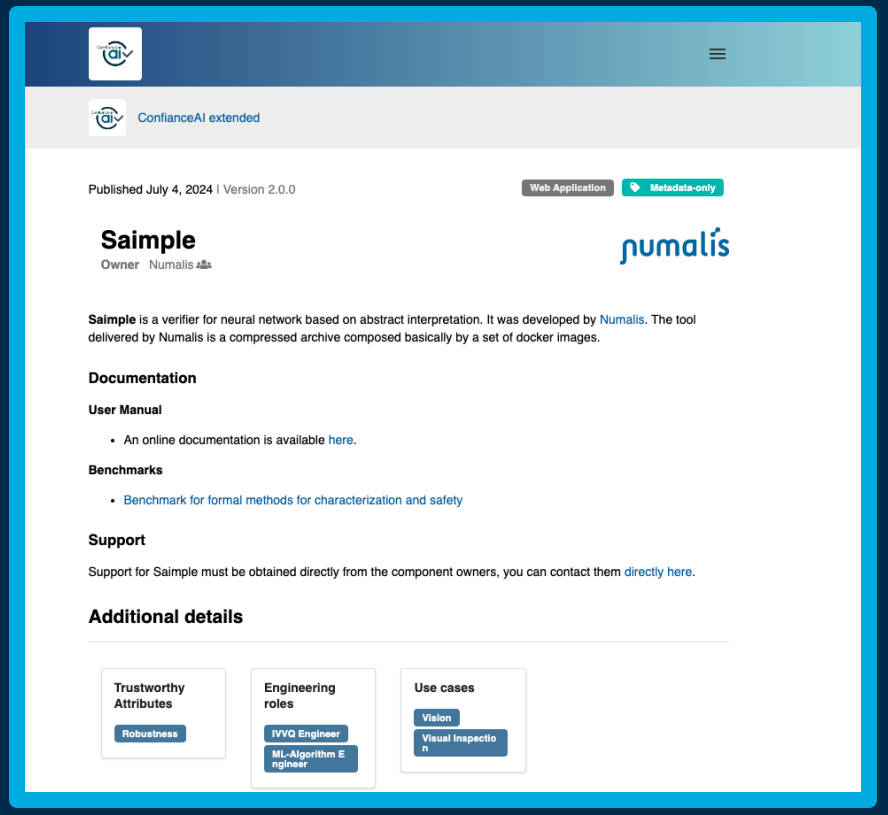


Easy integration in any development environment with API and SDK

Proudly Featured On



OECD.AI catalogue of
trustworthy AI development tools



CONFIANCE.AI catalogue of
trustworthy AI development tools

Integrated in IBM watsonx.governance

Raising AI Maturity Across the Board

By helping build state-of-the-art Governance, Risk and Compliance framework

Organization

numalis

Use for :
Compliance to art. 9 of AI Act

How :
- Consulting
- Auditing
- Training

People and Process

aicet®

Use for :
Compliance to art. 4 of AI Act

How :
- Competence inventory
- Competence evaluation
- Competence certification

Product

saimple

Use for :
Compliance to art. 15 of AI Act

How :
- Robustness validation & XAI
- Licensing SaaS / on-prem
- Maintenance and training

Thank you for your attention

+33 (0)4 67 15 10 78
contact@numalis.com