

# AI-based CCAM: Trustworthy, Explainable, and Accountable

## Project description

The AITHENA project proposes the definition of a common and harmonized **methodology for AI-based CCAM** solutions (perception, situational awareness, decision-making and traffic management) development and testing focusing on the **trustworthy AI** pillars (accuracy, explainability, accountability, privacy, ethics) **to serve the diverse end user types**: vehicle drivers, function developers, and certification/legal bodies. AITHENA will work and advance on three AI aspects: **DATA, AI MODELS** development and **TESTING and Validation** approaches.

## Project objectives

- To create explainable AI (XAI) in CCAM development and testing frameworks by investigating three main pillars of AI: data, models and testing.
- To investigate on AI-ethics to design, develop, implement and operate trustworthy AI systems for CCAM applications.
- To specify, design and develop a life-cycle management framework for ML algorithms and CCAM applications for enable automation of ML workflows to accelerate and trace model building, training and experiments.
- To define a new methodology for the trustworthy AI features (privacy, explainability, accountability, ethics) and analyse trade-offs between them, proposing a set of Key Performance Indicators (KPI) for AI-based unit testing in CCAM validation.
- To make available created data and tools through the European data sharing initiatives (OpenData and OpenTools) to foster research on trustworthy AI for CCAM.

## Harmonized Methodology



AI



Design



Development



Deployment/Testing

CCAM

### DATA

- Explainable, privacy-preserving and traceable data management Tools
- Development Framework ("DevOps" like) to ensure data and model lifecycle tracking and management
- Digital Twin for data generation

### AI ALGORITHMS

- XAI models - research and development of explainable AI models (hybrid, physically informed, reinforcement ...)
- Development of human-centric AI solutions strengthening user acceptance, explainability and trustworthiness

### TESTING & VALIDATION

- AI Testing and validation procedures: methodology to include AI based functions and systems
- Trusted AI Key Performance Indicators for CCAM components



UC-1 Trustworthy Perception Systems for CCAM



UC-2 AI extended Situational Awareness / Understanding



UC-3 Trustworthy and Human understandable Decision-making



UC-4 AI based Traffic management

## Project partners

TU/e ENHOOVEN UNIVERSITY OF TECHNOLOGY

TNO

MAP

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