AI Certification and Assessment Catalogues: Practical Use & EU AI Act

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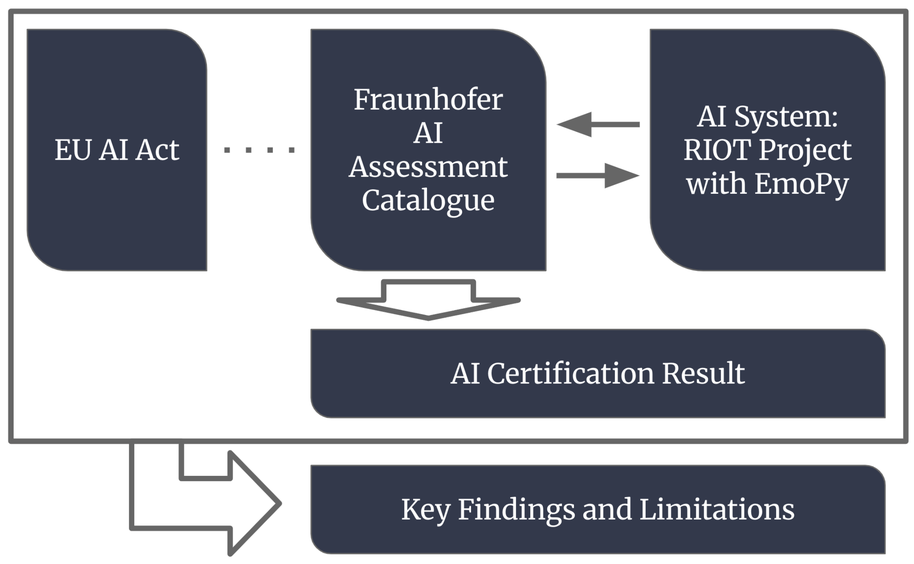
Problem

- AI has shifted from niche research to **widely used, high-impact applications** across healthcare, finance, industry, and daily life.
- This rapid proliferation has sparked concerns over **safety, privacy, fairness, and broader ethical implications**.
- Emerging regulations such as the EU AI Act demand **comprehensive certification frameworks** for trustworthy AI systems.
- There is currently **no complete and practical certification pipeline**, and key questions remain on how to operationalise AI certification effectively.

Our Approach

We applied the Fraunhofer AI Certification Catalogue to an open-source facial emotion recognition system integrated into the RIOT art installation. Our approach involved first selecting an AI system, then compiling and completing the system documentation and then applying the catalogue for the dimensions reliability and fairness. We then analysed this process and its shortcomings.

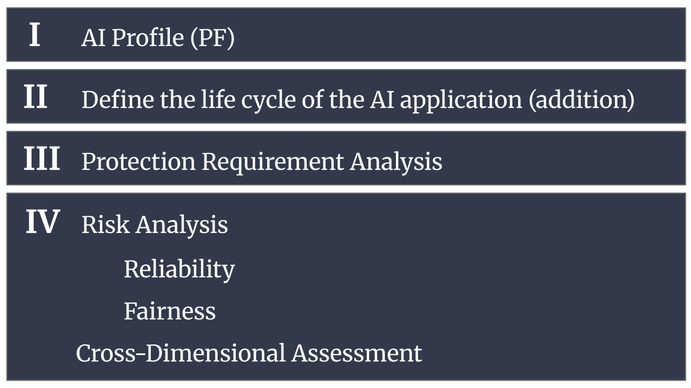


EU AI Act & Initiatives

- The **EU AI Act**, in effect since August 2024, is a comprehensive and far-reaching regulatory framework for AI, applying a **technology-neutral, function-based definition** with risk categories.
- Key risk categories include: prohibited AI systems, high-risk AI systems, general-purpose AI systems, AI systems with special transparency obligations and limited-risk AI systems.
- **Global initiatives**, such as Japan's AI risk management bill or the Paris AI Summit, highlight a **worldwide movement toward structured AI governance**.

Certification Catalogues

We looked at three different certification catalogues and their strengths and weaknesses: **Trusted Artificial Intelligence** by TÜV, **Auditing Machine Learning Algorithms** by several audit institutes and the **Fraunhofer AI Assessment Catalogue** which we used for our sample certification. Its main steps can be seen in the figure below:



EmoPy/RIOT Project

The RIOT art installation adapts a film's plot based on viewer emotions, detected using the EmoPy facial emotion recognition framework. We chose this system as it appears well documented, is open-source and integrates the AI-Component in a wider system.

Conclusion & Full Paper

- Our sample certification using the Fraunhofer Catalogue revealed **complexities and practical challenges**, especially around documentation and developer support.
- The catalogue offers a **comprehensive and systematic framework**, but the process can be time-intensive and rigid.
- In the future we want to try to continue the certification attempt by **integrating feedback directly into the AI system design**.

Certification Results

We found shortcomings, particularly in the fairness dimension, which would make the system not certifiable in its current state.

Dimension	Summary of Risk Analysis
Reliability	The system performs well enough within its defined scope, but lacks complete documentation and robustness testing. It is certifiable with improvements in testing and documentation.
Fairness	The system lacks sufficient analysis of potential biases and discriminatory behavior, with no clear fairness metrics or target groups defined, making it uncertifiable without significant further improvements.

Key Findings and Limitations

Which parts of the catalogue are most useful and could there be simplifications? The AI lifecycle overview helped create a structured system understanding. However, the high level of detail occasionally led to nearly redundant questions.

Providing a more practical understanding of the AI certification process. Selecting a system with solid documentation and a clear real-world context was crucial. The Fraunhofer Catalogue's step-by-step, questionnaire-like structure was generally effective.

Discovering the limitations where sample certifications encounter challenges. The system was no longer under development, and lacking an active feedback loop prevented us from resolving documentation gaps. This underscores the need for ongoing development support.

The **Fraunhofer Catalogue**, with its strong emphasis on documentation, **effectively pinpoints critical risks, but requires considerable time**.