GENESIS-AI

Self-Improving Generative Intelligence

for Cybersecurity in Complex Infrastructures.

Funded by the European Union

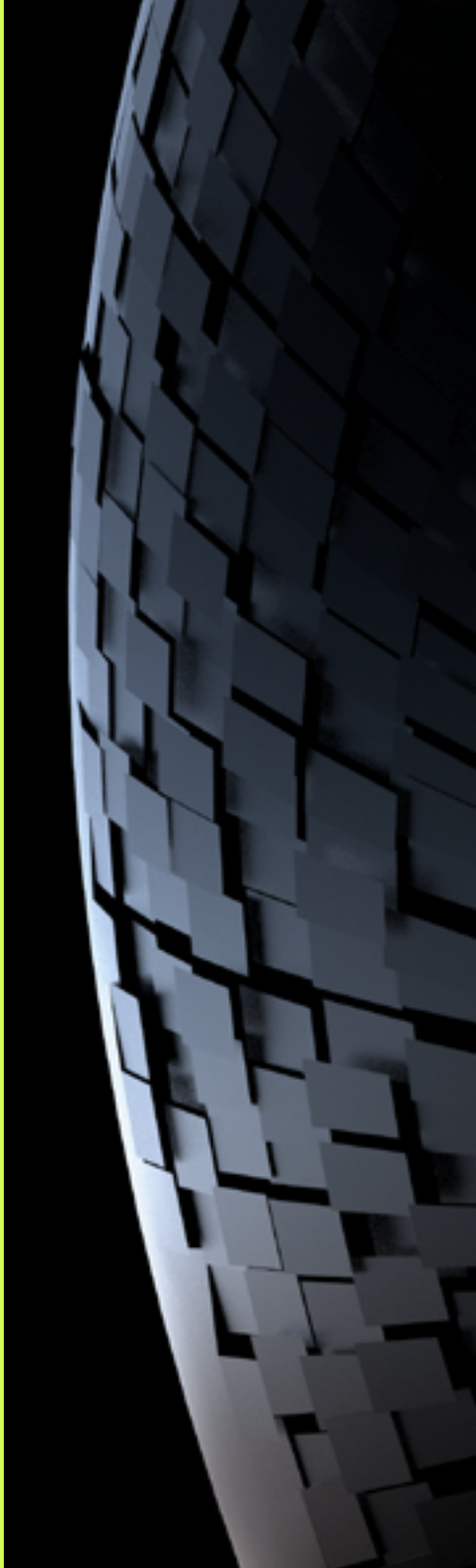
ECCC EUROPEAN CYBERSECURITY COMPETENCE CENTRE

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GENESIS-AI

About

GENESIS-AI is a next-generation European initiative developing a self-improving, regulation-aware Generative AI ecosystem for cybersecurity. The project combines Multi-Agent Systems (MAS), Mixture-of-Experts (MoE), federated learning, and explainable AI to create a trusted cyber defence framework that continuously adapts to emerging threats while remaining aligned with European regulations such as the AI Act, NIS2, and GDPR. Rather than relying on static security solutions, GENESIS-AI enables autonomous reasoning, adaptive protection, compliance intelligence, and self-healing capabilities across cloud, edge, and critical infrastructure environments. By integrating governance, transparency, privacy, and resilience into a unified architecture, GENESIS-AI aims to strengthen Europe's digital sovereignty and transform cybersecurity from reactive defence into proactive, trustworthy intelligence.





Vision

GENESIS-AI envisions a future in which cybersecurity systems are not merely reactive tools, but autonomous, trustworthy, and continuously evolving digital guardians. Our vision is to establish a sovereign European AI ecosystem that can understand, anticipate, and counter emerging cyber threats while remaining fully aligned with European values, regulations, and ethical principles. By combining self-improving Generative AI, multi-agent intelligence, explainability, privacy-preserving learning, and adaptive governance, GENESIS-AI aims to transform cybersecurity into a proactive and resilient capability. The project seeks to empower organisations across critical sectors with secure, transparent, and regulation-aware AI technologies, strengthening Europe's digital sovereignty and setting new global standards for trustworthy AI-driven cyber defence.



Motivation

Europe's digital infrastructure is facing an increasingly complex threat landscape, where cyberattacks evolve faster than traditional security solutions can respond. Current AI-powered cybersecurity tools are often fragmented, opaque, and dependent on static intelligence, making them insufficient against sophisticated, multi-vector, and zero-day threats. At the same time, organisations must navigate a growing regulatory landscape shaped by the AI Act, NIS2, GDPR, and the Cyber Resilience Act. GENESIS-AI was created to address these challenges by building a trustworthy, explainable, and regulation-aware Generative AI ecosystem. By combining adaptive intelligence, privacy-preserving learning, autonomous resilience, and compliance-by-design, the project aims to strengthen Europe's cyber resilience, digital sovereignty, and trust in AI-driven cybersecurity solutions.



Mission & Objectives

GENESIS-AI's mission is to transform cybersecurity from a reactive discipline into a proactive, trustworthy, and continuously evolving intelligence ecosystem. By combining Generative AI, multi-agent collaboration, federated learning, and compliance-by-design, the project seeks to strengthen Europe's digital sovereignty while ensuring transparency, resilience, and alignment with European regulations. GENESIS-AI will deliver a new generation of cybersecurity solutions capable of learning, adapting, explaining, and governing themselves in rapidly changing threat environments.

Key Objectives

- O1. Establish a Governance and Interoperability Framework for Heterogeneous AI Systems
- O2. Enable Reflexive, Self-Improving Multi-Agent Governance
- O3. Operationalise Knowledge and Compliance Intelligence
- O4. Deploy Generative Cybersecurity Experts
- O5. Reinforce Adversarial Robustness through Adaptive Red/Blue Teaming
- O6. Ensure Privacy-Preserving Distributed Learning
- O7. Achieve Explainability, Fairness, and Transparency in Decision-Making
- O8. Guarantee Integrity and Provenance Across the AI Lifecycle
- O9. Develop Autonomous Self-Healing and Resilient AI Systems
- O10. Validate and Demonstrate the Integrated Ecosystem in a Secure Cyber Range

Partners

GENESIS-AI unites 15 leading partners from 11 European countries in a multidisciplinary consortium spanning academia, research, technology SMEs, and industry. By combining cutting-edge expertise in trustworthy AI, cyber defence, distributed computing, embedded systems, and critical infrastructure, the consortium provides the capabilities needed to take GENESIS-AI from research to validation and deployment.



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8 University of Essex
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9 Budapest University of Technology and Economics
Hungary [BUDAPEST]

10 University of Turku
Finland [TURKU]

11 Siemens Aktien Gesellschaft
Germany [MUNICH]

12 SecureML
Croatia [SESVETE]

13 Airbus Protect
France [BLAGNAC]

14 Robert Bosch GmbH
Germany [GERLINGEN-SCHILLERHOEHE]

15 Barcelona Supercomputing Center
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Facts



Budget

€ 13.7 Million
100% EU Funded



Consortium

15 Partners
11 countries



Duration

36 Months
10/2026 - 09/2029

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Find out more about this Project:
https://genesis-ai-project.eu/

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