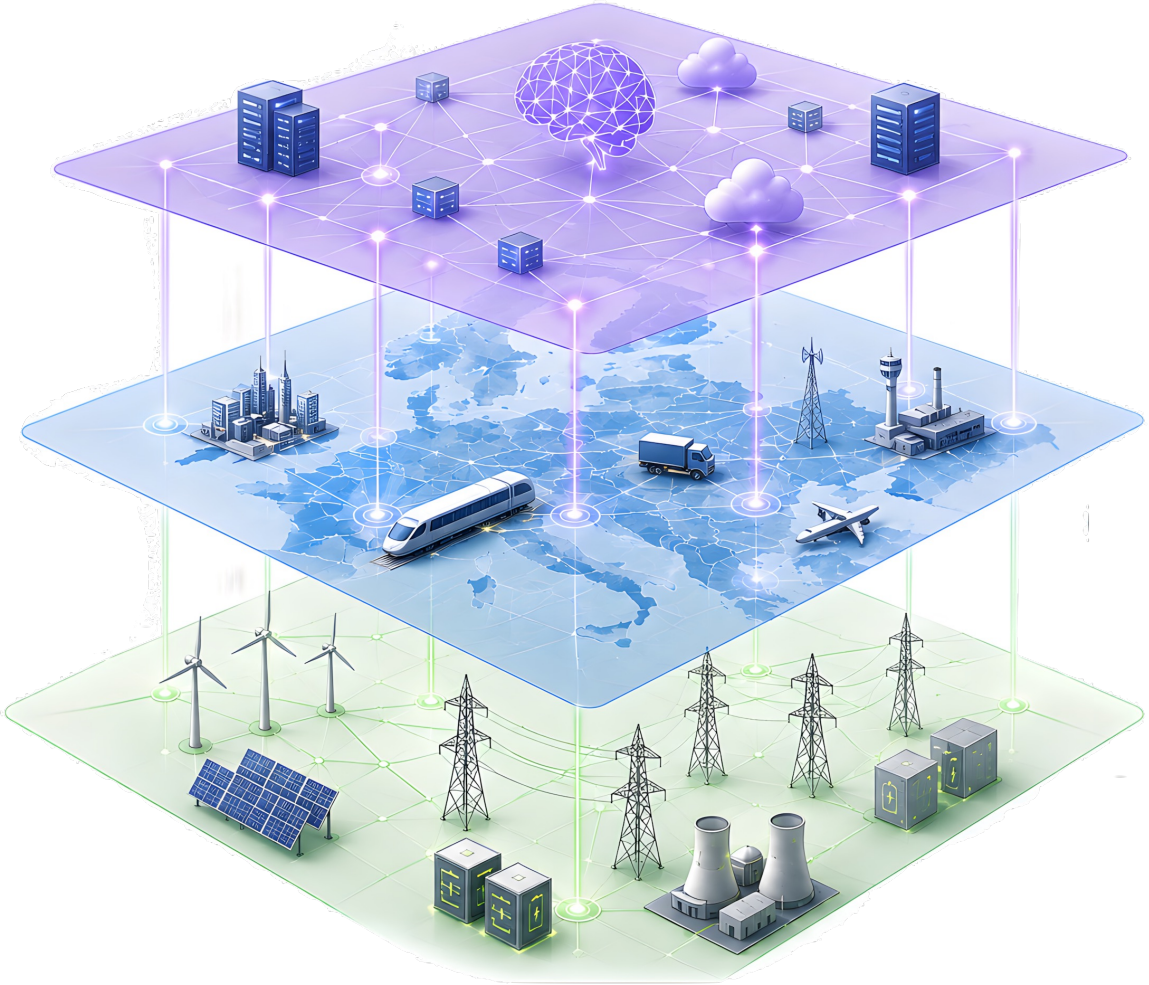
Marie Skłodowska-Curie Actions:
Doctoral Networks

(AICORE) AI-powered COnnected critical infrastructures for Resilient Europe

Training the next generation of engineers for resilient **networks of networks**



What is an MSCA Doctoral Network?

A collaborative training programme for the next generation of researchers and engineers

FOR THE PHD STUDENTS

- Joint European PhD training program
- International and interdisciplinary education
- Academic + industrial supervision

FOR THE PARTNERS

- Access to highly qualified talent
- Early access to cutting-edge research
- Shape research topics relevant to your sector
- Strengthen European innovation ecosystem

FUNDING SOURCES

- Horizon Europe funded program
- Covers salaries, mobility, and training costs
- Typical project duration: 4 years

KEY FEATURE: Every doctoral candidate spends a significant period in both academia and industry, creating a direct bridge between fundamental research and real-world challenges.

INDUSTRIAL PARTICIPATION: TWO POSSIBLE MODES

BENEFICIARY

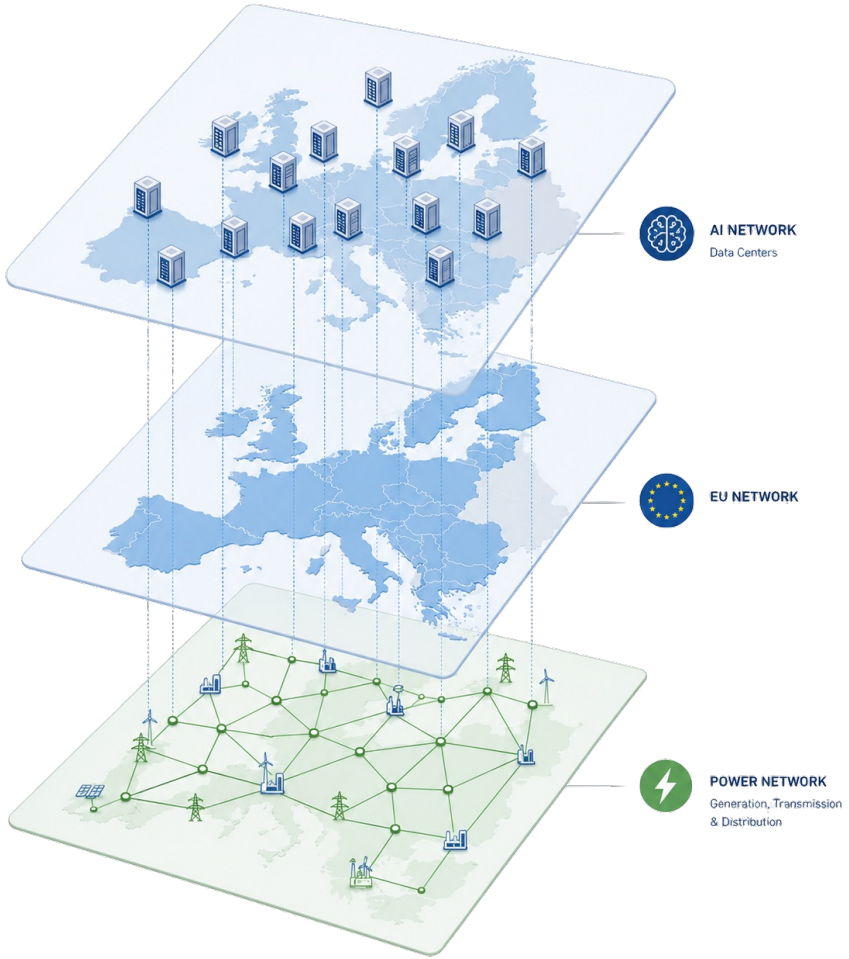
- Recruits a doctoral candidate directly
- Receives EU funding
- Full participation in project governance
- Greater influence on training and research agenda

ASSOCITED PARTNER

- Hosts secondments (student visits)
- Provides supervision and case studies
- No direct management of EU funds
- Lowest administrative burden

MSCA Doctoral Networks build long-term partnerships between academia, industry and other sectors to tackle critical challenges and drive European excellence and competitiveness.

Project context and driving factors



AI is rapidly becoming a critical infrastructure

- Massive deployment of data centers
- Growing dependence of society on AI-enabled services

Critical infrastructures are becoming deeply interconnected

- Power grids ↔ AI/data centers ↔ transportation ↔ water
- Decisions in one network affect the others

Unprecedented stress on infrastructure

- Explosive growth in computing and electricity demand
- Electrification, digitalization, and climate-driven disruptions

Emerging systemic risks

- Failures can cascade across multiple infrastructure layers
- AI, cyber, and physical networks create new vulnerabilities
- Local disturbances can trigger large-scale societal impacts

Europe faces a critical talent shortage

- Few experts can jointly address AI, control, energy, optimization, and networked systems
- Current training remains largely discipline-specific

Project vision

To train a new generation of researchers and innovators capable of designing, controlling, and securing the AI-powered critical infrastructures of the future.

The challenge:

- Future infrastructures are evolving into tightly coupled AI–Power systems
- Today's approaches overlook cross-sector interactions, systemic risks

The training philosophy: develop the three dimensions of the problem

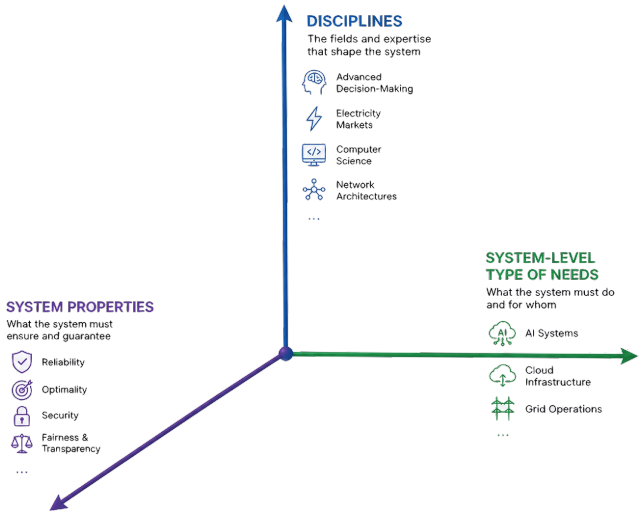
- Disciplines: AI, control, optimization, power systems, computing, policy
- Systems: data centers, communication networks, electricity grids, markets
- Objectives: reliability, resilience, safety, efficiency, sustainability, and equity

The scientific paradigm:

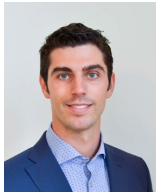
- Move from isolated infrastructure design to a network-of-networks perspective
- Combine data-driven intelligence, optimization, and decision-making

The outcome:

- A new generation of engineers capable of designing, operating, and governing trustworthy AI-enabled critical infrastructures for Europe



Consortium (current)



UCLouvain

Prof. Dr. Gianluca Bianchin

Online decision-making, reliable networks

UCLouvain (Belgium)

KTH

Prof. Dr. Karl H. Johansson

Automation networks, cyber-secure control

Sweden

UCLouvain

Prof. Dr. Raphaël Jungers

Critical systems, formal methods, computer science

UCLouvain (Belgium)

ETH zürich

Prof. Dr. Florian Dörfler

Power networks, network science

Switzerland

UCLouvain

Prof. Dr. Julien M. Hendrickx

Networked, distributed systems

Belgium

TU/e

Prof. Dr. Maurice Heemels

Cyber-physical systems

The Netherlands

TU/e

Prof. Dr. Mauro Salazar

Cyber-socio-technical systems, mobility

The Netherlands