University of Messina, Italy
Department of Mathematical and Computer Sciences,
Physical Sciences and Earth Sciences

Subject: Internship Proposal

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Project Supervisor

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Project details

Title	Intelligent Cybersecurity: Code Vulnerability Detection with Machine Learning, Large Language Models, and Federated Learning

Detailed description: The aim of this project is to study and develop innovative cybersecurity solutions, focusing on source code vulnerability detection through Machine Learning, Large Language Models (LLMs), and Federated Learning approaches. The student will be engaged in the following activities:

analysis of state-of-the-art methods for code vulnerability detection,
experimentation with ML/LLM models applied to software security,
design and use of AI agents (Agentic AI) for automating vulnerability detection and mitigation,
application of Federated Learning for securely sharing trained models across multiple sources without direct code exchange.
The project provides multidisciplinary skills in cybersecurity, artificial intelligence, and distributed systems, with practical applications in software and digital infrastructure protection.

Duration (month – max 12)	12
Duration (hours)	undefined
Open positions	1

Internship Skills

Technical requirements: Possesses basic knowledge of programming languages, algorithms, data structures, machine learning and cybersecurity.	
Other skills	Willingness and aptitude for teamwork. Strong commitment and availability to attend the facilities of the FCRLab.