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PIANO NAZIONALE DI RIPRESA E RESILIENZA

ARTIFICIAL INTELLIGENCE

PNRR - Enhancing Hardware Security in RISC-V Architecture through Artificial Intelligence

Funded By	MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [P.iva/CF:97429780584] Politecnico di TORINO [P.iva/CF:00518460019]
Supervisor	DI CARLO STEFANO - stefano.dicarlo@polito.it
Contact	SAVINO ALESSANDRO - alessandro.savino@polito.it DI CARLO STEFANO - stefano.dicarlo@polito.it
Context of the research activity	Explore the integration of artificial intelligence (AI) techniques into RISC-V computer architecture to enhance hardware security. Progetto finanziato nell'ambito del PNRR PNRR M4C2, Investimento1.3 - Avviso n. 341 del 15/03/2022 - PE0000014 Security and Rights in the CyberSpace (SERICS) - CUP E13C22001850001
Objectives	The increasing complexity and interconnectedness of modern computer systems have raised concerns about their vulnerability to security threats. This Ph.D. proposal aims to explore the integration of artificial intelligence (AI) techniques into RISC-V computer architecture to enhance hardware security. By leveraging the flexibility and openness of the RISC-V instruction set architecture (ISA), this research seeks to develop novel AI-based solutions that can detect and mitigate various hardware security vulnerabilities, including side-channel attacks, hardware Trojans, and fault injections.
Skills and competencies for the development of the activity	Candidate must possess a combination of technical skills, knowledge, and research capabilities: - Strong understanding of computer architecture, particularly the RISC-V ISA - Proficiency in hardware security concepts - Solid knowledge of AI and machine learning techniques - Proficiency in HDL, such as Verilog, VHDL, or SystemVerilog, and experience with C/C++, Rust, and Python are required - Ability to read and understand the literature - Effective English communication skills, both written and verbal