



Soggetto: proposta di tirocinio

<i>ID</i>	PTI_IT_GIACOBBE MAURIZIO_07/03/2026 22.12.09
<i>Data</i>	07/03/2026 22.12.09

Supervisore del progetto

<i>Cognome</i>	GIACOBBE
<i>Nome</i>	MAURIZIO
<i>Dipartimento</i>	Dipartimento di Scienze Matematiche e Informatiche, Scienze Fisiche e Scienze della Terra
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Co-Supervisore del progetto

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Dettagli del progetto

Titolo	Real-Time Determinism in the Continuum: Integrating RTOS with Distributed Meta-OS for CPS		
<i>Descrizione dettagliata:</i> In modern Cyber-Physical Systems, not all tasks are equal. While data logging can be delayed, control loops (e.g., motor actuation) require hard real-time guarantees. This project explores how a Real-Time Operating System (RTOS) can be integrated with a Distributed Meta-OS to ensure that cost-saving and sustainability strategies do not compromise the safety-critical timing of the physical system. Main activities are: a comparative study of RTOS scheduling algorithms; Analysis of communication protocols for real-time data exchange; Simulation of a "Time-Sensitive" workload (measuring how the Meta-OS decides which tasks must stay on the RTOS-driven Edge and which can be migrated to save energy); Evaluating the impact of parameters (e.g., network latency) on the control loop stability of the CPS.			
Durata (mesi – max 12)	9		
Durata (ore)	100		
Numero di posizioni aperte	3		

Competenze richieste dal tirocinio

Requisiti tecnici: The Candidate should have strong understanding of Operating Systems (interrupts, multitasking, scheduling), good knowledge of C or Python for performance



scripting, familiarity with concepts of Data Science for statistical analysis of latency distributions; ability to run experiments on Linux.

Altri requisiti

Scientific writing and documentation; team communication and regular progress reporting; problem-solving mindset; ability to read research papers and implement methodologies.