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📍 Via Masserione, 24 (BN)

Education

PhD in Information Technology for Engineering

University of Sannio | Dec 2025 – Present
(Expected completion: 2028)

- Research focus: Control, monitoring and protection of DTT HCD plants.

Master's Degree in Electronics Engineering for Automation and Sensing

University of Sannio | 2023 – 2025

- Final Grade: 110/110 with honors (Summa cum laude)

Bachelor's Degree in Computer Engineering

University of Sannio | 2020 – 2023

- Final Grade: 110/110 with honors (Summa cum laude)

Languages

Italian: Native

English: B2 Level (Cambridge Certification)

Spanish: B1 Level (DELE Certification)

Gerardo Manganiello

About me

I am a **PhD student** in Information Technology for Engineering at the University of Sannio, with a strong research interest in technologies applied to nuclear fusion and sustainable energy. During my research internship at ENEA Frascati Research Centre, I focused on developing SCADA systems and control models for key components of the ICRH system in the **DTT Tokamak**, managing the integration between supervisory interfaces, industrial protocols and real-time control architectures. My PhD project focuses on the control, monitoring and protection of the DTT HCD (Heating and Current Drive) plants, aiming to contribute to the advancement of technological infrastructures for nuclear fusion.

Research Experience

Research Intern

ENEA Frascati Research Centre | June 2025 – August 2025

- Developed and validated control and supervisory models for two key components of the DTT Tokamak ICRH system: the SODA Unit and the Stub Tuner and Phase Shifter Unit.
- HMI Design in WinCC OA: developed complete graphical user interfaces for real-time supervision, configuration and monitoring.
- OPC UA/MARTE2 Integration: modeled process variables as OPC UA nodes and connected them to the MARTE2 real-time framework to ensure bidirectional communication with the CODAS (Control and Data Acquisition System) architecture.
- Alarm and Fault Management: implemented a structured system utilizing numerical coding and bitmasks to effectively distinguish between communication, hardware and configuration errors.
- State Machines & Operating Modes: built in accordance with CODAS specifications, featuring strict parameter segregation and visualization.

Technical Skills

- Programming & Modeling: C, Java, Assembly, Verilog, MATLAB/Simulink, LabVIEW, Python, COMSOL, Machine Learning.
- Control & Supervisory Systems: SCADA (WinCC OA), OPC UA protocol, HMI interfaces, state-machine modeling.
- Frameworks & Tools: MARTE2, GitLab, LaTeX

Soft Skills

- Strong teamwork and collaboration abilities
- Excellent problem-solving skills
- Outstanding communication and presentation skills
- Autonomous work ethic and strong attitude toward continuous learning