UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

Seminar Announcement

DIPARTIMENTO DI INFORMATICA

The Seminars on "Information Technology Outlook" - PhD Program in Computer Science and Mathematics

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Tuesday Nov 11, 2025
11:00

Sala Consiglio 7° floor
Dept. of Computer Science

Engineering Sustainable Security: Diagnosis and Mitigation of Evolving Threats in Smart Homes

With software systems increasingly embedded in our daily lives, we expect them to remain secure not only by design but throughout their evolution. This talk explores *sustainable security* — the ability of a system to preserve its security goals as it evolves over time. Focusing on smart homes, we address two key challenges: diagnosing previously unseen attacks and managing system changes driven by software, network, or user evolution.
We present techniques that combine machine learning, abductive reasoning, and inductive learning to diagnose unknown attacks, adapt security controls, and sustain protection as systems evolve. Using real-world smart home datasets (CICIoT2023 and IoT-23) and a custom-built testbed, we demonstrate continuous learning approaches that detect and adapt to evolving threats. Finally, we consider user perceptions and information needs in securing smart homes. Together, these contributions illustrate how sustainable security can be engineered through adaptive diagnosis, continuous learning, and human-centred design.

Dr. Liliana Pasquale received her Ph.D. degree from Politecnico di Milano, Italy, in 2011. She is currently an Associate Professor at University College Dublin (UCD), Ireland, and a Funded Investigator at Lero, the Research Ireland Research Centre for Software. She is the founder and director of the MSc in Cybersecurity at UCD. Her research interests include requirements engineering and adaptive systems, with a focus on security and digital forensics. She will be the General Co-chair of ICSE 2027 and has served as PC Co-Chair of SEAMS 2024 and REFSQ 2020. She has served in the program and organising committee for prestigious software engineering conferences, such as ICSE, FSE, ASE, RE, and SEAMS. She is an Associate Editor of IEEE Transactions on Software Engineering the Department Editor of IEEE Security & Privacy Magazine, and was a member of the Review Board of ACM TOSEM journal.