

# Rosario Catelli

Tutor: Prof. Valentina Casola (DIETI)

co-Tutor: Eng. Concetta Pragliola (Ansaldo STS)

XXXIII Cycle - I year presentation

Cybersecurity tools and techniques  
to protect telecommunication and  
railway signalling systems

# My background

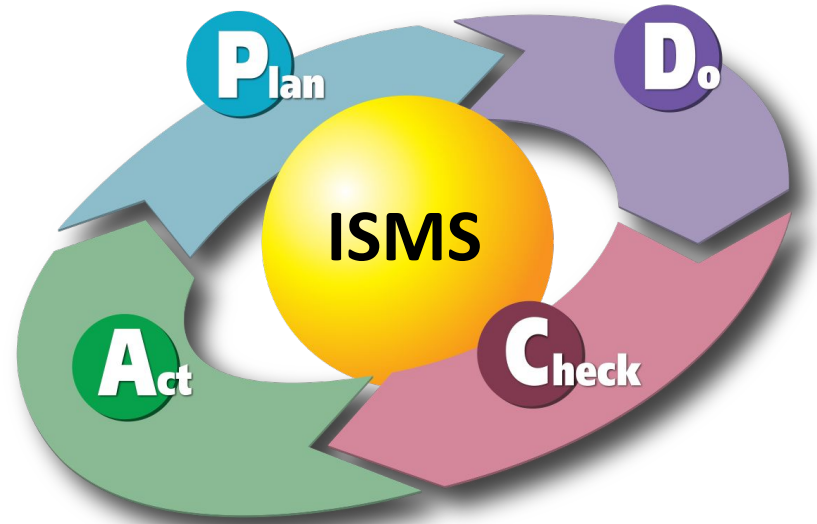
- **Graduation:** M.Sc. Degree in Electronic Engineering
- **DIETI Group:** SecLab research group
- **Cooperation:** Ansaldo STS, A Hitachi Group Company
- **Fellowship:** Ansaldo STS Ph.D. grant

Ansaldo STS    A Hitachi Group Company



# My problem

I am involved in the **cybersecurity related management and operational activities** carried out by Ansaldo STS, which are mainly focused on the implementation of an **Information Security Management System (ISMS)** for corporate systems and tools in compliance with **ISO 27001 standard**.



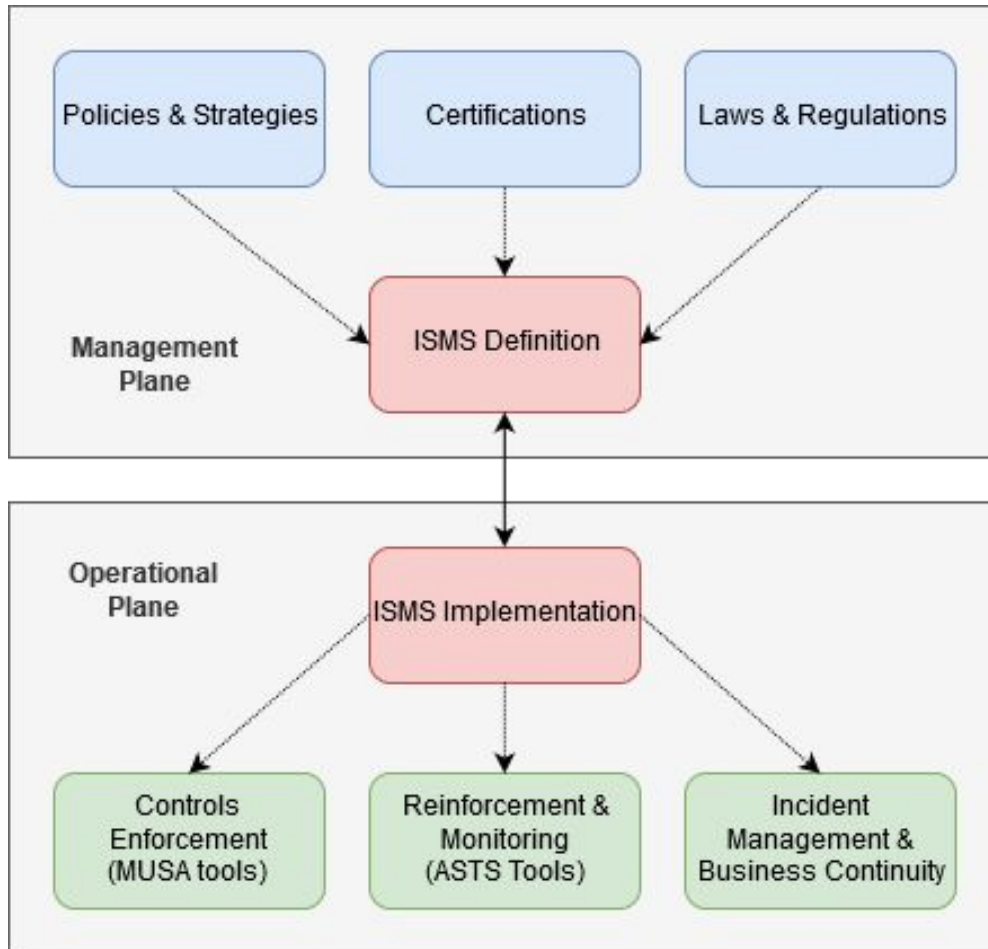
The **certification process life cycle is currently human assisted** and includes supporting the suppliers in verifying their compliance to standard guidelines, supporting auditing activities and enhancing the adopted risk management frameworks.

# Open research challenges

- ISMSs are currently implemented in compliance with ISO standards but there is no well-defined scheme to follow.
  - The excess of freedom leads to a proliferation of thousands of different ISMSs. There is the need for innovative models to **define commonly accepted frameworks or improve the existing ones.**
- Too much human intervention is required in the **implementation process** (from design to incident management), slowing down the entire management chain.
  - **Automated techniques** are needed to transform security skills in a security knowledge base and build usable tools.



# My research activity



- Support to **Security Management Activities**:
  - Identify templates for configuring an ISMS according to specific patterns (novel pattern-based ISMSs) and reference standards (ISO, NIST, etc...)
- Support to **Security Operational Activities**, based on the analysis of the state of the art about:
  - Automated security enforcement tools (MUSA)
  - Reinforcement and monitoring tools and services (ASTS SeSaR, SIEM and SOC)
  - Novel automated incident management techniques (MTD and Digital Forensics)

# My products

- ASTS internal reports on the analysis and modelling of current certification processes (in order to identify and propose a pattern-based ISMS).

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- A draft paper to submit to the 28<sup>th</sup> IEEE International Conference on Enabling Technologies: Infrastructure for Collaborative Enterprises (WETICE-2019) - deadline 20<sup>th</sup> February.



# Next years

- First year report and next year estimation

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Cycle XXXIII

	Credits year 1								Credits year 2								Credits year 3								Total	Check
	Estimated	1	2	3	4	5	6	Summary	Estimated	1	2	3	4	5	6	Summary	Estimated	1	2	3	4	5	6	Summary		
Modules	20	0	0	6	3	3	7.2	19.2	11							0								0	19.2	30-70
Seminars	5	0	0	0.6	5.2	0	0	5.8	5							0								0	5.8	10-30
Research	35	10	10	3.4	1.8	7	2.8	35	44							0								0	35	80-140
	60	10	10	10	10	10	10	60	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	180

- Research directions for next year
  - [M]: Novel approaches to Information Security (Semantic Knowledge Management)
  - [O]: Study and development of new techniques for incident management (Moving Target Defence and Digital Forensics)





# Thank you!



## Questions?

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