Stefano Longari

Curriculum Vitae

Via Europa 18 San Donato Milanese, 20097, MI Italy □ +39 340 818 6441 ☑ stefano.longari@polimi.it ☞ Website □ LinkedIn ☞ Scholar ☞ Scopus

Last updated: April 7, 2025

I received my Ph.D. degree in Information Technology from Politecnico di Milano in June 2021 with a thesis on the security of automotive systems. I am currently an assistant professor (RTDa) at Politecnico di Milano, working in the system security group at NECST Laboratory inside the Dipartimento di Elettronica, Informazione e Bioingegneria. The focus of my research revolves around threat modeling and developing offensive and defensive techniques for the security of cyber-physical systems and transportation systems, e.g., automotive, space, industry 4.0, and critical infrastructure. I teach mainly courses and lectures on (cyber-physical) systems security and social engineering.

Contents

0	Overview1	0	Academic Roles	. 4
0	Research Interests	0	Speaker Engagements	. 5
0	Experience	\circ	Advisor Activities	6
0	Education	0		_
0	Publications	0	Teaching Activities	.7
0	Fundings4	0	Other Activities	. 8

Overview

Current Role: Junior Researcher (RTDa) at Politecnico di Milanosince May 2023Scientific Productivity: Author of 6 Q1 journal papers and 17 peer-reviewed conference papers. Author of 2 patents.

Based on Google Scholar: h-index 8 citations 295 Based on Scopus: h-index 7 citations 189

Fundings: Task leader for the *AHEAD* european project, participant of the *SARIL* and *KEEPER* european projects. Local PI for the *SOCRATE* project funded by ASI, and participant to the *MICS* PNRR project. PI for an industrial contract on satellite cybersecurity.

Academic Roles: Chair and member for the master *thesis examination boards* of Politecnico di Milano and Bocconi. Coordinator of the *Security Specialist specialization degree* (equivalent to an academic master) for CEFRIEL and Politecnico di Milano. Organizer of OWASP Italy Day 2023.

Worked as PC of 9 cybersecurity-related conferences, amongst which ACSAC and DIMVA. Reviewer for 13 Q1 journals and transactions.

Invited Talks: Various presentations at industrial events, HackInBo, and Hardwear.io.

Advisor Activities:

Currently advisor of 3 Ph.D. students in Computer Science and Engineering. Advisor or Co-advisor of over 50 Master Theses for the Computer Science and Engineering Master. Advisor of \sim 5 Master Theses for the Cyber Risk Strategy and Governance Master.

Teaching Activities: Currently course instructor for 1 Ph.D. course, 2 Master courses, and various industrial courses.

Ph.D.: Advanced Research Topics in Cybersecurity.

Master: Human and Physical Aspects of Security course for Politecnico di Milano.

Master: Emerging Topics in Cybersecurity Course for Bocconi.

Research Interests

My research spans approximately seven years, beginning with my Ph.D. studies, which initially focused on automotive cybersecurity. I concentrated on securing vehicle on-board systems, specifically targeting vulnerabilities and intrusion detection mechanisms within the Controller Area Network (CAN) protocol. This early work involved creating real-world datasets, publishing *machine learning-based IDS frameworks*, and identifying *novel threats* and attack surfaces.

Building upon this foundation in automotive security, I have broadened my expertise into the wider domain of Cyber-Physical Systems (CPS). My current research encompasses diverse fields, still including the automotive one, but expanding to industrial robots, railway infrastructure, e-vehicle charging solutions, satellite systems, and critical infrastructure resilience. Across these domains, my main interests are *attack detection and threat modeling*, exploring threats emerging from integrating novel technological solutions into existing systems.

Additionally, I am participating in various projects addressing emerging cybersecurity challenges involving AI-driven social engineering, covert communication channels utilizing Large Language Models (LLMs), and vulnerabilities within federated learning systems.

Experience

Junior Researcher (RTDa)

Politecnico di Milano (Milan, Italy)

Research topic: Threat modeling, offensive, and defensive measures for novel cyber-physical systems. *Research group:* NECSTLab, System security research group.

Postdoctoral Researcher

Politecnico di Milano (Milan, Italy)

Research topic: Offensive and defensive security techniques for cyber-physical systems. *Research group:* NECSTLab, System security research group.

Research Internship

ESCRYPT GmbH (Stuttgart, Germany)

Research topic: Development of new security techniques for automotive on-board CAN-connected devices.

Education

Ph.D. in Information Technology, Politecnico di Milano	Jun 2021
Dissertation title: On the security of connected automotive systems	
M.Sc. in Computer Science and Engineering, Politecnico di Milano	Apr 2018
Dissertation title: On the security of connected vehicles	
Bachelor in Computer Science and Engineering, Politecnico di Milano	Sep 2015

Publications

Productivity and Impact Metrics

Scientific Productivity: Author/Co-author of 7 scientific publications on journal papers, including 6 top-ranked Q1 journal papers based on SCIMAGO, and 17 peer-reviewed conferences, including 1 top-ranked security conference where the work received an award for its value. 14 publication entries on Scopus (+8 yet to be published but accepted in Scopus-indexed venues). 23 publication entries on Google Scholar.

Based on Google Scholar: h-index 8 citations 295 Based on Scopus: h-index 7 citations 189

Peer-reviewed Journals

- Barelli, R., D'Onghia, M., & Longari, S. (2025). Towards Secure Electronic Voting: a Survey on E-Voting Systems and Attacks. (To be published) IEEE Access.
- Longari, S., Jannone, J., Carminati, M., Tanelli, M., & Zanero, S. (2024). *Janus: A Trusted Execution Environment Approach for Attack Detection in Industrial Robot Controllers.* IEEE Transactions on Emerging Topics in Computing.

May 2023 — Current

Jun 2021 — Apr 2023

Oct 2019 — Apr 2020

- Longari, S., Pozone, A., Leoni, J., Polino, M., Carminati, M., Tanelli, M., & Zanero, S. (2023). *CyFence: Securing Cyber-physical Controllers Via Trusted Execution Environment.* IEEE Transactions on Emerging Topics in Computing.
- Nichelini, A., Pozzoli, C. A., **Longari, S.**, Carminati, M., & Zanero, S. (2023). *Canova: a hybrid intrusion detection framework based on automatic signal classification for CAN.* Computers & Security, 128, 103166.
- Maffiola, D., Longari, S., Carminati, M., Tanelli, M., & Zanero, S. (2021). GOLIATH: A Decentralized Framework for Data Collection in Intelligent Transportation Systems. IEEE Transactions on Intelligent Transportation Systems.
- Longari, S., Valcarcel, D. H. N., Zago, M., Carminati, M., & Zanero, S. (2020). CANnolo: An anomaly detection system based on LSTM autoencoders for controller area network. IEEE Transactions on Network and Service Management, 18(2), 1913-1924.
- Zago, M., Longari, S., Tricarico, A., Carminati, M., Pérez, M. G., Pérez, G. M., & Zanero, S. (2020). ReCAN–Dataset for reverse engineering of Controller Area Networks. Data in brief, 29, 105149.

Peer Reviewed Conference Proceedings

- Mammone, D. and Bossi, L., Carminati, M., Zanero, S., & Longari, S. (2025). Linux hurt itself in its confusion! Exploiting Out-of-Memory Killer for Confusion Attacks via Heuristic Manipulation. (To be published) SIG SIDAR Conference on Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA 2025)
- Panebianco F., and Isgrò, A., Longari, S., Zanero, S., & Carminati, M. (2025). Guessing As A Service: Large Language Models Are Not Yet Ready For Vulnerability Detection. (To be published) Joint National Conference on Cybersecurity (ITASEC & SERICS 2025)
- Balossini, M., Carminati, M., Zanero, S., & Longari, S. (2025). *Micro-Mobility Security: A Holistic Approach via Mobile App Analysis.* (To be published) Joint National Conference on Cybersecurity (ITASEC & SERICS 2025)
- Abbasi, S.M., & Longari, S. (2025). CANPak: An Intrusion Detection System against Error Frame Attacks for Controller Area Network. (To be published) Joint National Conference on Cybersecurity (ITASEC & SERICS 2025)
- Giannubilo, D., Giorgeschi, T., Carminati, M., Zanero, S., & Longari, S. (2025). A Deep Learning Approach for False Data Injection Attacks Detection in Smart Water Infrastructure. (To be published) Joint National Conference on Cybersecurity (ITASEC & SERICS 2025)
- Longari, S., Galletti, G, Holle, J., & Zanero, S. (2025). *CANter: data-link layer detection of drop-and-spoof attacks* on CAN and CAN FD. (To be published) Joint National Conference on Cybersecurity (ITASEC & SERICS 2025)
- Amico, A., Apicella, V., Bianchini, D., Butera, A., Cesana, M., Digregorio, G., Garda, M., Gatteschi, V., Innamorati, C., Leotta, F., Longari, S., Pizzo, M.R., (2025). BOTQUAS: Blockchain-based Solutions for Trustworthy Data Sharing in Sustainable and Circular Economy. Proceedings of the Euromicro Conference on Software Engineering and Advanced Applications (EUROMICRO-SEAA 2024).
- Cestari, R., Longari, S., Zanero, S., & Formentin, S. (2025). Model Predictive Control with adaptive resilience for Denial-of-Service Attacks mitigation on a Regulated Dam. (To be published) 2024 Conference on Decision and Control (CDC 2024).
- Digregorio, G., Cainazzo, E., Longari, S., Carminati, M., & Zanero, S. (2024, June) Evaluating the Impact of Privacy-Preserving Federated Learning on CAN Intrusion Detection. In proceedings of the IEEE Vehicular Technology Conference Spring (VTC Spring 2024).
- Cerracchio, P., Longari, S., Carminati, M., & Zanero, S. (2024, February) *Investigating the Impact of Evasion Attacks Against Automotive Intrusion Detection Systems.* In Proceedings of the 2024 Symposium on Vehicle Security and Privacy (VehicleSec 2024).
- Marazzi, M., Longari, S., Carminati, M., & Zanero, S. (2024, February) Securing LiDAR Communication through Watermark-based Tampering Detection. In Proceedings of the 2024 Symposium on Vehicle Security and Privacy (VehicleSec 2024).
- Longari, S., Pozzoli, C. A., Nichelini, A., Carminati, M., & Zanero, S. (2023, June). Candito: improving payloadbased detection of attacks on controller area networks. In International Symposium on Cyber Security, Cryptology, and Machine Learning (pp. 135-150). Cham: Springer Nature Switzerland.
- Longari, S., Noseda, F., Carminati, M., & Zanero, S. (2023, June). Evaluating the Robustness of Automotive Intrusion Detection Systems Against Evasion Attacks. In International Symposium on Cyber Security, Cryptology, and Machine Learning (pp. 337-352). Cham: Springer Nature Switzerland.
- Avanzi, D., Longari, S., Polino, M., Carminati, M., Zanchettin, Tanelli, M., & Zanero, S. (2023). Task Aware Intrusion Detection for Industrial Robots. In Proceedings of the Italian Conference on Cyber Security (ITASEC 2023) (pp. 1-16). CEUR.
- de Faveri Tron, A., Longari, S., Carminati, M., Polino, M., & Zanero, S. (2022, November). CANflict: Exploiting Peripheral Conflicts for Data-Link Layer Attacks on Automotive Networks. In Proceedings of the 2022 ACM SIGSAC Conference on Computer and Communications Security (pp. 711-723).

- Longari, S., Penco, M., Carminati, M., & Zanero, S. (2019, November). *Copycan: An error-handling protocol based intrusion detection system for controller area network.* In Proceedings of the ACM Workshop on Cyber-Physical Systems Security & Privacy (pp. 39-50).
- Longari, S., Cannizzo, A., Carminati, M., & Zanero, S. (2019, December). A secure-by-design framework for automotive on-board network risk analysis. In 2019 IEEE Vehicular Networking Conference (VNC) (pp. 1-8). IEEE.

Awards

- Best Paper Runner Up, Securing LiDAR Communication through Watermark-based Tampering Detection. 2024 Symposium on Vehicle Security and Privacy (VehicleSec 2024).
- Best Paper Honorable Mention, CANflict: Exploiting Peripheral Conflicts for Data-Link Layer Attacks on Automotive Networks. 2022 ACM SIGSAC Conference on Computer and Communications Security.

Patents

- Sistema di controllo in tempo-reale implementato mediante computer per il controllo di un sistema o dispositivo fisico (Computer-implemented real-time control system for controlling a physical system or device), International application ref: WO2023002321A1. Numero di pubblicazione italiano: IT202100018998A1. S. Longari, A. Pozone, M. Tanelli, S. Zanero. Published 2023. 01. 26.
- Submitted: Verfahren zum Erkennen eines Angriffs auf einen zu sichernden Busteilnehmer, Überwachungseinheit und Bussystem (Method for detecting an attack on a to be protected bus node, monitoring system and the bus). Registration number: DE 102022207911.6. S. Longari, J. Holle. Registered on 01.08.2022.

Fundings

European Projects:

AHEAD: Al-informed Holistic EVs integration Approaches for Distribution grids Role: Task Leader.	2024 — 2028	
SARIL: Sustainability And Resilience for Infrastructure and Logistics networks Role: Participant.	2023 — 2026	
KEEPER: Key Code based on Nanomaterials to Protect Services and Products Role: Participant.	2024 — 2027	
Other open calls: SOCRATE: Satellite Operations Cyber Range Evaluation	2023 — 2025	
Role: Local PI.	0000 0005	
Founding source: PNRR Role: Participant.	2023 — 2025	
Industrial contracts:		
Satellite Cybersecurity: development of Intrusion Detection Solutions for intra-satellite networks Founding source: D-Orbit Role: Pl.	2024 — 2025	
Academic Roles		
Specialization Degree Coordinator:		
Security Specialist specialization degree ("Master universitario di primo livello"). Organizers: CEFRIEL and Politecnico di Milano Number of students: ~20	2022 — Present	

Length: 2yrs.

Events and Conferences Organization:

OWASP Italy Day 2023

Organizers: OWASP Italy and Politecnico di Milano

Program Committee:	
- Annual Computer Security Applications Conference, ACSAC	2025
- Italian conference on Cybersecurity, ITASEC	2024 — 2025
 IEEE Security and Privacy Symposium, IEEE S&P (Subreviewer) 	2023 — 2025
- Conference on Detection of Intrusions and Malware & Vulnerability Assessment, DIMVA	2024
- Workshop on Re-design Industrial Control Systems with Security, RICSS (in conjunction with	1 Euro S&P) 2023
- Cyber-Physical System Security Workshop, CPSS (in conjunction with ASIACCS)	2023
- Workshop on Automotive Cybersecurity, ACSW (in conjunction with EURO S&P)	2022 - 2025
- Joint Workshop on CPS & IoT Security and Privacy, CPSIOTSec (In conjunction with ACM	C(S) = 2022
- International Conference on Security for Information Technology and Communications, Security	C2022 2022
Reviewer:	
- ACM Transactions on Cyber-Physical Systems, ACM TCPS	2025
 IEEE Internet of Things Journal, IEEE IoT 	2022 — 2025
- Elsevier Computer and Security, COSE	2019 — 2025
- ACM Computing Surveys, ACM CSUR	2024
- IEEE Transactions on Automation Science and Engineering, IEEE T-ASE	2024
- ACM Computers and Communication Security, ACM CCS (Subreviewer)	2023 — 2024
- IEEE Transactions on Intelligent Transportation Systems IEEE T-ITS	2024
- IEEE Transactions on Aerospace and Electronic Systems, IEEE TAES	2023 2022 - 2023
- IEEE Transactions on Dependable and Secure Computing, IEEE TDSC	2022
- IEEE Transactions on Industrial Informatics, IEEE TII	2021 — 2022
- IEEE Transactions on Information Forensics and Security, IEEE T-IFS	2021
 IEEE Transactions on Emerging Topics in Computing, IEEE TETC 	2018
Other Academic Roles:	
Examination Board Chair	2024 — Current
Course: Computer Science and Engineering Master, Politecnico di Milano	
	2222
Examination Board Member	2022 — Current
Course: Computer Science and Engineering Master, Politecnico di Milano	
Examination Board Member	2023 — Current
Course: Cyber Risk Strategy and Governance Master, Bocconi and Politecnico di Milano	
Academic Advisor for Politecnico's Carreer Service	2025 — Current
Handle industrial stages proposed to the students of the Cyber Risk Strategy and Governance	e master.
Academic Cybersecurity Area Referent for MADE Competence Center	2023 — Current
Organize the future directions of the cybersecurity area in cooperation with the industrial par	tners.
Speaker Engagements	
Invited Talks	

- REDDER Level Up	2024
Title: L'anello debole: l'IA punta sugli esseri umani	
- Bosch Next Event	2024
Title: Challenges in Industrial Cybersecurity	
- Hromatka Group	2023
Title: Risk and Industrial Security	
- HackInBo	2022
Title: The CAN Link-Layer, or how we implemented a broken protocol, and can we fix it?	

- Automotive Security Research Group	2021
Title: CAN Error Handling Attacks and Countermeasures	
- Hardwear.io	2019
Title: It's easier to break than to patch: a stealthy DoS attack against CAN	
- Infosek conference	2018
Title: Automotive Security	
Paper Presentations	
- Italian Conference on Cyberesecurity (ITASEC)	2025
Paper - CANPak: An Intrusion Detection System against Error Frame Attacks for Controller Area I Paper - A Deep Learning Approach for False Data Injection Attacks Detection in Smart Water Infra	Vetwork astructure
- Italian Conference on Cyberesecurity (ITASEC)	2024
Paper - CANter: data-link layer detection of drop-and-spoof attacks on CAN and CAN FD	
- Symposium on Vehicle Security and Privacy (VehicleSec)	2024
Paper - Investigating the Impact of Evasion Attacks Against Automotive Intrusion Detection System Paper - Securing LiDAR Communication through Watermark-based Tampering Detection.	ns.
- International Symposium on Cyber Security, Cryptology, and Machine Learning (CSCML)	2023
Paper - Candito: improving payload-based detection of attacks on controller area networks	
Paper - Evaluating the robustness of automotive intrusion detection systems against evasion attack	S
 IEEE Vehicular Networking Conference (IEEE VNC) 	2019
Paper - A secure-by-design framework for automotive on-board network risk analysis	
 ACM Workshop on Cyber-Physical Systems Security & Privacy (ACM CPS-SPC) 	2019
Paper - Copycan: An error-handling protocol based intrusion detection system for controller area ne	etwork

Advisor Activities

Ph.D. Thesis Advisor Activities:

(temporary title) On the security of e-vehicle charging infrastructure. Balossini Marco	2024 — Current
Security of Cyber-Physical Systems. Mammone Daniele	2023 — Current
Offensive and Defensive Cybersecurity for Critical Infrastructures. Digregorio Gabriele	2023 — Current

Master Thesis Advisor Activities:

A DL Approach for FDI Attacks Detection in SWI Giannubilo Davide & Giorgeschi Tommaso	2025
Exploiting Out-of-Memory Killer for Confusion Attacks via Heuristic Manipulation. Bossi Lorenzo	2025
Evaluating FL Algorithms for Intrusion Detection in the Automotive Domain. Cardani Federico	2025
Enhancing Security in Blockchain-based Decentralized FL. Caroli Federico & Bleggi Francesco	2025
Threat Modeling of Autonomous Vehicle Security: a Case Study on the AIDA Prototype. Boccia Giuseppe	2024
CANdemonium: An Evaluation Test Bed for Objective CAN IDSs Benchmarking. Azzarà Daniele	2024
Implementation of a DNS Filtering System for User-Friendly Online Security. Zuelli Arianna Luisa	2024
Bypassing ARM TrustZone Security: A JTAG-based Approach. Martelli Vincenzo	2024
Towards Effective CAN IDS Validation: Dataset Limitations and Requirements Definition. Porta Alessia	2024
Performance Evaluation of CANdito . Marelli Giacomo	2024
Sandboxing in Space: A Feasibility Study on Application Sandboxing for Small Satellites. Marra Gabriele	2024
Race Conditions Detection in Web Applications: An Analysis Tool. Paratici Ilaria	2024
Novel attack strategies targeting PROFIbus and PROFIsafe Exploiting Error Management. Alfonsi Alessio	2024
CANPak: An IDS against Stealthier Attacks for CAN. Mehmood Abbasi Sikandar	2024
Meeting Proof Protocol: a Protocol for Physical Anchor Systems. Sironi Mattia	2024
Empirical Security Evaluation of Digital Therapeutic Applications. Gervasio Dario Alex	2024
Micro-Mobility Security: A Systematic Approach via Mobile App Analysis. Balossini Marco	2024
CANtera: A novel real-world dataset on advanced CAN attacks for IDSs. Valencic Jas	2024
Evaluation of Graph-based IDS Based on Outlier Detection Methods for CAN-bus. Balalipour Pedram	2024
On the feasibility of Adversarial Attacks against IDSs in Automotive CAN. Montalbano Ivan	2024
Location inference through social media and social relationships. Rizzi Matteo	2023
Panettone: evaluating federated learning implementations of CAN IDSs. Cainazzo Elisabetta	2023
A Blockchain-based framework to enhance air traffic control security using ADS-B protocol. Saputelli Edoardo	2023

A Comprehensive Study of Cyber Threats and Countermeasures in Micromobility. Rosati Nicholas 2023 Exploring gradient-based evasion techniques against automotive intrusion detection systems. Cerracchio Paolo 2023 Towards Secure Electronic Voting : a Literature Review on E-Voting Systems and Attacks. Barelli Riccardo 2023 Securing Lidar communication through watermark-based tampering detection. Marazzi Michele 2023 Co-Advisor of over 20 Master Theses over the years 2018-2025 **Teaching Activities** Course Instructor - Ph.D.s: - Advanced Research Topics In Cyber Security 2024 - 2025Politecnico & Bocconi, Computer Science and Engineering & Cyber Risk Strategy and Governance Milan, Italy Number of students: ~ 10 . Hours: 30/year. Course Instructor - Masters: - Human and Physical aspects of Security 2024 — Current Politecnico & Bocconi, Computer Science and Engineering & Cyber Risk Strategy and Governance Milan, Italy Number of students: \sim 60. Hours: 50/year. - Emerging Topics in Cybersecurity 2024 — Current Bocconi, Cyber Risk Strategy and Governance Master Milan, Italy Number of students: \sim 30. Hours: 16/year. 2022 - 2024- Social Engineering Bocconi, Cyber Risk Strategy and Governance Master Milan, Italy Number of students: \sim 30. Hours: 16/year. Teaching Assistant - Masters & Bachelors: Cybersecurity Technologies, Procedures and Policies 2023 — Present Politecnico & Bocconi, Cyber Risk Strategy and Governance Milan, Italy Number of students: \sim 30. Hours: 17/year. - Informatica B 2023 — 2024 Politecnico di Milano, Ingegneria Energetica e Matematica Milan, Italy Number of students: \sim 250. Hours: 25/year. - Computer Security 2019 - 2023Politecnico di Milano, Computer Science and Engineering Milan, Italy Number of students: \sim 200. Hours: 10/year. Non-University Courses: 2022 — Current - Cybersecurity CEFRIEL & Politecnico di Milano, "security specialist" specialization degree. Milan, Italy Number of students: \sim 25. Hours: 110/year. - Introduction to Industrial Cybersecurity 2023 — Present MADE Competence Center per l'Industria 4.0 Milan, Italy Various single-day instances between 2 and 8 hours. 2019 - 2022Cybersecurity POLI.DESIGN, Fundamentals of the air transport system Milan, Italy Number of students: \sim 20. *Hours:* ~ 10 /year.

Recorded Courses:

Introduction to Industrial Cybersecurity
 MADE Competence Center per l'Industria 4.0
 12 ~30 minutes lectures on the basics of security in industrial scenarios.

2024 Milan, Italy

Other Activities

Interviews on deepfake social engineering for RAI Consulting work for RAI Radiotelevisione Italiana

2024 2024