

Michele Carminati

Curriculum Vitae et Studiorum

Politecnico di Milano, Dipartimento di
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Short Biography

I received a Ph.D. degree (cum laude) in Information Technology from the Politecnico di Milano in Italy, where I am currently a postdoctoral researcher. Since February 2018 I am an adjunct professor of the computer security course at Politecnico di Milano. My research interests are focused on cybersecurity, in particular on fraud detection and financial malware analysis through the application of machine learning techniques. I am actively involved in research projects funded by the European Union and I am also co-founder of Banksealer, a Fintech spin-off of Politecnico di Milano.

Education

- 2013 - 2017 **Ph.D. Degree in Information Technology**, *cum laude*, Politecnico di Milano, Milan.
Advisor: Prof. Stefano Zanero.
Dissertation Title: Internet Banking Fraud Analysis and detection.
- 2010 - 2013 **M.Sc. (Laurea Magistrale) in Computer Science and Engineering**, *110/110 cum laude*, Politecnico di Milano, Milan.
Advisor: Prof. Stefano Zanero.
Thesis Title: Banksealer: a transaction monitoring system for Internet banking fraud detection.
- 2007 - 2010 **B.Sc. (Laurea di Primo Livello) in Computer Science and Engineering**, *109/110*, Politecnico di Milano, Milan.
Advisor: Prof. Giovanni Agosta.
Thesis Title: Progetto e ottimizzazione di un sistema di cifratura XTS-Blowfish per architetture GPGPU.

Experience

Research Activity

- 2017 - Today **Postdoctoral Researcher**, *Politecnico di Milano*, Milan.
System security research group
- 2015 - 2016 **Visiting Researcher**, *Northeastern University*, Boston.
Advisors: Engin Kirda, William Robertson.

Industrial Activity

- 2016 - Today **Co-founder** of BankSealer, a university spinoff delivering novel fraud detection solutions for banking and payment systems, based in Milano, Italy.

Teaching Activity

- 2019 **Contract Professor**, *Course: Computer Security*, Politecnico di Milano, Milan.
- September 2019 - Today **Teaching Assistant**, *Course: CYBER SECURITY TECHNOLOGIES, PROCEDURES AND POLICIES*, Politecnico di Milano-Università Bocconi, Milan.
Course Instructor: Stefano Zanero.
- May 2019 - Today **Lecturer**, *Course: Computer and Network Security - Progetto [Regione Lombardia] Master Cyber Security*, CEFRIEL, Milan.
- 2019 **Tutor**, *Course: Informatica*, Politecnico di Milano, Milan.
Course Instructor: Marco Lattuada.
- 2018 **Contract Professor**, *Course: Computer Security*, Politecnico di Milano, Milan.
- 2017 - 2018 **Teaching Assistant**, *Course: Privacy and Security*, Politecnico di Milano, Como.
Course Instructor: Stefano Zanero.

- 2017 **Teaching Assistant**, *Course: Computer Security*, Politecnico di Milano, Milan.
Course Instructor: Stefano Zanero.
- 2016 - 2017 **Teaching Assistant**, *Course: Privacy and Security*, Politecnico di Milano, Como.
Course Instructor: Stefano Zanero.
- 2016 **Seminar** on “Machine Learning for Fraud Detection”, as part of Advance Topics in Computer Security course, Ph.D. in Information Security, Politecnico di Milano, Milan, Italy
- 2015 **Teaching Assistant**, *Course: Computer Security*, Politecnico di Milano, Milan.
Course Instructor: Federico Maggi.
- 2014 **Teaching Assistant**, *Course: Computer Security*, Politecnico di Milano, Milan.
Course Instructor: Federico Maggi.

Advisor Activity

- 2014 - Today **Co-advisor** of 11 M.Sc. Thesis. Currently, I am advising 5 M.Sc. Thesis
- 2013 - 2014 **Co-advisor** of two B.Sc. Thesis.

Talks and Seminars

- 2018 **Speaker** at the Community of User WORKSHOP ON FORENSICS, Bruxelles
- 2018 **Speaker** at International Conference on Detection of Intrusions and Malware, and Vulnerability Assessment. DIMVA 2018. Campus Paris- Saclay, France, “FraudBuster: Temporal Analysis and Detection of Advanced Financial Frauds”.
- 2018 **Speaker** at Italian Conference on Cyber Security, ITASEC 2018, Milan, Italy, “A Supervised Auto-Tuning Approach for a Banking Fraud Detection System”.
- 2017 **Speaker** at CYBER CRIME: LA MINACCIA INVISIBILE CHE CAMBIA IL MONDO - Osservatori.net Digital Innovation - Milan, Italy.
- 2016 **Speaker** at the IV CONFERENCE ON APPLICATION SECURITY AND MODERN TECHNOLOGIES - SICUREZZA E GOVERNANCE NELL'ERA DELL'INTERNET OF THINGS, Venice - “BankSealer: A Decision Support System For Internet Banking Fraud Analysis and Investigation”.
- 2015 **Seminar** on “Machine Learning for Fraud Detection”, Microsoft Research, Mountain View, Palo Alto, USA.
- 2014 **Speaker** at International Conference on ICT Systems Security and Privacy Protection, IFIP SEC 2014, Marrakech, Morocco, “BankSealer : An Online Banking Fraud Analysis and Decision Support System”.
- 2014 **Speaker** at Infosek Conference, Nova Gorica - “BankSealer : An Online Banking Fraud Analysis and Decision Support System”.

Publications

Peer-Reviewed Journals

- 2018 **M. Carminati**, M. Polino, A. Continella, A. Lanzi, F. Maggi, and S. Zanero. “**Security Evaluation of a Banking Fraud Analysis System**”. In: ACM Trans. Priv. Secur. 21.3 (Apr. 2018), 11:1–11:31. ISSN : 2471-2566. DOI : 10.1145/3178370 . URL : <http://doi.acm.org/10.1145/3178370>.
- 2017 A. Continella, **M. Carminati**, M. Polino, A. Lanzi, S. Zanero, and F. Maggi. “**Prometheus: Analyzing WebInject-based information stealers**”. In: Journal of Computer Security 25 (Feb. 2017), pp. 1–21. doi: 10.3233/JCS-15773.
- 2015 **M. Carminati**, R. Caron, F. Maggi, I. Epifani, and S. Zanero. “**BankSealer: A decision support system for online banking fraud analysis and investigation**”. In: Computers & Security 53 (2015), pp. 175– 186. issn: 0167-4048. doi: 10.1016/j.cose.2015.04.002. url: <http://www.sciencedirect.com/science/article/pii/S0167404815000437>.

Peer-Reviewed Conference Proceedings

- 2018 **M. Carminati**, A. Baggio, F. Maggi, U. Spagnolini, and S. Zanero. “**FraudBuster: Temporal Analysis and Detection of Advanced Financial Frauds**”. In: Detection of Intrusions and Malware, and Vulnerability Assessment. Ed. by C. Giuffrida, S. Bardin, and G. Blanc. Cham: Springer International Publishing, 2018, pp. 211–233. isbn: 978-3-319-93411-2.

- 2018 P. De Nicolao, M. Pogliani, M. Polino, **M. Carminati**, D. Quarta, and S. Zanero. “**ELISA: Eliciting ISA of Raw Binaries for Fine- Grained Code and Data Separation**”. In: Detection of Intrusions and Malware, and Vulnerability Assessment. Ed. by C. Giuffrida, S. Bardin, and G. Blanc. Cham: Springer International Publishing, 2018, pp. 351–371. isbn: 978-3-319-93411-2.
- 2017 **M. Carminati**, L. Valentini, and S. Zanero. “**A Supervised Auto-Tuning Approach for a Banking Fraud Detection System**”. In: Cyber Security Cryptography and Machine Learning. Ed. by S. Dolev and S. Lodha. Cham: Springer International Publishing, 2017, pp. 215–233. isbn: 978-3-319-60080-2.
- 2014 **M. Carminati**, R. Caron, F. Maggi, I. Epifani, and S. Zanero. “**BankSealer: An Online Banking Fraud Analysis and Decision Support System**”. In: ICT Systems Security and Privacy Protection. Ed. by N. Cuppens-Boulahia, F. Cuppens, S. Jajodia, A. Abou El Kalam, and T. Sans. Berlin, Heidelberg: Springer Berlin Heidelberg, 2014, pp. 380–394. isbn: 978-3-642-55415-5.

Peer-Reviewed Workshop

- 2019 S. Longari, M. Penco, M. Carminati, S. Zanero “**CopyCAN: An Error-Handling Protocol based Intrusion Detection System for Controller Area Network**”. In: ACM Workshop on Cyber-Physical Systems Security & Privacy (CPS-SPC’19)
- 2018 G. Viglianisi, **M. Carminati**, M. Polino, A. Continella, and S. Zanero. “**SysTaint: Assisting Reversing of Malicious Network Communications**”. In: Proceedings of the 8th Software Security, Protection, and Reverse Engineering Workshop. SSPREW-8. San Juan, PR, USA: ACM, 2018, 4:1–4:12. isbn: 978-1-4503-6096-8. doi: 10.1145/3289239.3289245. url: <http://doi.acm.org/10.1145/3289245>.

Posters

- 2017 N. Mariani, A. Continella, M. Pogliani, **M. Carminati**, F. Maggi, and S. Zanero. “**Poster: Detecting WebInjects through Live Memory Inspection**”. 2017, IEEE Symposium on Security and Privacy 2017.
- 2015 **M. Carminati**, R. Caron, F. Maggi, I. Epifani, and S. Zanero. “**Poster: BankSealer: A Decision Support System For Internet Banking Fraud Analysis and Investigation**”. 2015.SIG SIDAR Conference on Detection of Intrusions and Malware & Vulnerability Assessment, DIMVA 2015.

Others

- 2019 A. Erba, R. Taormina, S. Galelli, M. Pogliani, M. Carminati, S. Zanero, N. O. Tippenhauer. “**Real-time Evasion Attacks with Physical Constraints on Deep Learning-based Anomaly Detectors in Industrial Control Systems**” arXiv preprint arXiv:1907.07487.

Activities

- 2018 - 2019 **Cyberchallenge.it**, *CTF Trainings*, cyberchallenge.it is a university initiative to train young students as CTF players: Local Co-organizer.
<http://cyberchallenge.it>

Awards & Scholarship

- 2013 - 2016 Ph.D. scholarship from “M.I.U.R”.
- 2014 “Yves Deswarte” Best Student Paper Award, IFIP SEC2014.

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- Autorizzo al trattamento dati ai sensi del GDPR 2016/679 del 27 aprile 2016 (Regolamento Europeo relativo alla protezione delle persone fisiche per quanto riguarda il trattamento dei dati personali).
 - Autorizzo la pubblicazione del Curriculum Vitae sul sito istituzionale del Politecnico di Milano (sez. Amministrazione Trasparente) in ottemperanza al D. Lgs n. 33 del 14 marzo 2013 (e s.m.i.).