

TOMMASO INNOCENTI

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Research Overview

I have a PhD in Cybersecurity from Northeastern University with over five years of experience in authentication research. Thanks to my determination and rigorous discipline, I am confident in leading projects that tackle complex and challenging tasks and deliver results that create tangible results. My research demonstrates the challenges I face to create impactful work. Receiving the approval of sector experts enabled me to change industry-recognized standards as OAuth 2.0, increasing its security and reliance. Furthermore, I am co-chair of the Security interest group at W3C, leading the security review of global standards. I am eager to take on the next challenges and use my problem-solving capability to reach the project's goal.

WORK EXPERIENCE

Amazon Mar. 2025 – On going
Amazon Web Services | AWS security engineer New York, USA

- Member of the Guard duty team under the Security Analytics and AI Research group (SAAR)

Amazon Jun. 2024 – Aug. 2024
Amazon Web Services | AWS security engineer New York, USA

- Investigated Machine Learning detection system for domain generation algorithm (DGA) and DNS data-exfiltration identification
- Improved the detection of DGA domain by 40% implementing a Deep Learning approach (LSTM)
- Implemented a real-time system for DNS data-exfiltration matching out of band detection system

LEADERS Program Spring 2020 – (ongoing)
Gordon Institute of Engineering Leadership | Northeastern University Boston, USA

- Leadership and Project management training applied within a research project

Doctoral Researcher Apr. 2018 – Sep. 2018
Northeastern University Boston, USA

- Lead an international research project resulted in a presentation for the Federal Trade Commission
- Performed cutting edge security research that created my research foundation

Master Thesis at SecLab Nov. 2016 – June 2017
Less is more (Secure): automated reduction of the attack surface in modern Browser Boston, USA

- Investigated the Browser functionalities as potential attack surface
- Instrumented the Browser functionalities to define the minimal set of required functionality
- Generated a model able to reduce the Attack surface and increase the browser performance

EDUCATION

Ph.D. Computer Science | Cybersecurity Sep. 2019 – Mar. 2025
Northeastern University | GPA: 4.0/4.0 Boston, USA

Master in Computer Science and Engineering Sep. 2014 – May 2018
Politecnico di Milano | Grade: 101/110 Milano, Italy

Erasmus Experience Sep. 2015 – Feb. 2016
Universidad Complutense de Madrid (UCM) Madrid, Spain

SKILLS

Leadership & Project Management: LEADERS (certified training program), Research Lead, W3C SING (Co-Chain)
Languages: English C1 (TOEFL score:100/120) , Spanish A1, Italian (mother tongue)
Programming: C, Java, C++, Python, SQL, HTML, Node.js, Puppeteer, JavaScript, Docker, Git
Machine Learning: LSTM, RF
Document Creation: Microsoft Office Suite, LaTeX, Quip

PROJECTS AND RESEARCH

"Only as Strong as the Weakest Link": On the Security of Brokered Single Sign-On on the Web <i>Tommaso Innocenti</i> , Louis Jannett, Christian Mainka, Vladislav Mladenov, Engin Kirda IEEE Symposium on Security and Privacy '25 (A.R. 105/739 = 14.3%)	Spring 2025 San Francisco, CA
OAuth 2.0 Redirect URI Validation Falls Short, Literally <i>Tommaso Innocenti</i> , Matteo Golinelli, Ali Mirheidari, Kaan Onarlioglu, Bruno Crispo, Engin Kirda ACSAC'23 (A.R. 104/497 = 20.9%)	Fall 2023 Austin, TX
FRAMESHIFTER: Security Implications of HTTP/2-to-HTTP/1 Conversion Anomalies Bahruz Jabiyev, Steven Sprecher, Anthony Gavazzi, <i>Tommaso Innocenti</i> , Kaan Onarlioglu, Engin Kirda USENIX'22 (A.R. 392/2535 = 15.4%)	Sum 2022 Boston, MA
You've Got (a Reset) Mail: A Security Analysis of Email-Based Password Reset Procedures <i>Tommaso Innocenti</i> , Ali Mirheidari, Amin Kharraz, Bruno Crispo, Engin Kirda DIMVA'21 (A.R. 16/66 = 28.7%)	Sum 2021 Virtual

CONFERENCES AND PRESENTATIONS

OAuth security Workshop (OSW)'25 On the Security of Identity Brokers in Single Sign-On	February 2025 Reykjavik, Iceland
Internet Identity Workshop IIW39 Identity Brokers in OAuth: Facilitator, but at what cost?	October 2024 Mountain view, California
OWASP Italy Meetup OAuth 2.0 Redirect URI Validation Falls Short, Literally	March 2024 Virtual
OWASP Boston Chapter December meetup OAuth 2.0 Redirect URI Validation Falls Short, Literally	December 2023 Boston, Massachusetts
Annual Computer Security Applications Conference (ACSAC)'23 OAuth 2.0 Redirect URI Validation Falls Short, Literally	December 2023 Austin, Texas
OAuth Security Workshop (OSW)'23 OAuth 2.0 Redirect URI Validation Falls Short, Literally	August 2023 Royal Holloway University, London
Federal Trade Commission (FTC) invited talk You've Got (a Reset) Mail: A Security Analysis of Email-Based Password Reset Procedures	October 2021 Virtual
Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA)'21 You've Got (a Reset) Mail: A Security Analysis of Email-Based Password Reset Procedures	July 2021 Virtual

PROFESSIONAL SERVICES / NETWORK

Co-Chair Security Interest Group (SING) – Invited Expert World Wide Web Consortium (W3C)	July 2024
OpenID foundation Conformance-suite	October 2023
IETF OAuth Working Group OAuth 2.0 Security Best Current Practice	October 2023

SELECTED ACHIEVEMENT / GRANTS

Northeastern University Dissertation Completion Fellowships PhD network	August 2024 Boston, Massachusetts
Third place at Tracer FIRE (Forensic Incident Response Exercise) Capture The Flag Workshop ACSAC '23	December 2023 Austin, Texas
Annual Computer Security Applications Conference ACSAC '23 OAuth 2.0 Redirect URI Validation Falls Short, Literally Travel grant	December 2023 Austin, Texas
Connect2id security fix OAuth 2.0 Redirect URI Validation Falls Short, Literally	September 2023 Bulgaria
OAuth Security Workshop (OSW)'23 OAuth 2.0 Redirect URI Validation Falls Short, Literally Student scholarship	August 2023 London, United Kingdom
GO Language CVE-2022-27664 FRAMESHIFTER: Security Implications of HTTP/2-to-HTTP/1 Conversion Anomalies	September 2022 Google, Mountain View
Apache Traffic Server CVE-2022-31780 FRAMESHIFTER: Security Implications of HTTP/2-to-HTTP/1 Conversion Anomalies	August 2022 Wakefield, Massachusetts
Erasmus+ Exchange program	Sep. 2015 Feb. 2016 Complutense University of Madrid