

# TOMMASO INNOCENTI

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<https://innotommy.com> | Boston (MA)

## Research Overview

I am concluding my PhD in cybersecurity 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 improvements. My research testifies to the challenges I overcome 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. I am eager to take on the next challenges and use my problem-solving capability to reach the project's goal.

## WORK EXPERIENCE

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| <b>Amazon</b><br>Amazon Web Services   AWS security engineer   | Jun. 2024 – Aug. 2024<br>New York, USA |
| <ul style="list-style-type: none"><li>Investigated Machine Learning detection system for domain generation algorithm (DGA) and DNS data-exfiltration identification</li><li>Improved the detection of DGA domain by 40% implementing a DeepLearning approach (LSTM)</li><li>Implemented a real-time system for DNS data-exfiltration matching out of band detection system</li></ul> |  |
| <b>LEADERS Program</b><br>Gordon Institute of Engineering Leadership   Northeastern University   | Spring 2020 – (ongoing)<br>Boston, USA |
| <ul style="list-style-type: none"><li>Leadership and Project management training applied within a research project</li></ul>   |  |
| <b>Doctoral Researcher</b><br>Northeastern University  | Apr. 2018 – Sep. 2018<br>Boston, USA   |
| <ul style="list-style-type: none"><li>Lead an international research project resulted in a presentation for the Federal Trade Commission</li><li>Performed cutting edge security research that created my research foundation</li></ul>  |  |
| <b>Master Thesis at SecLab</b><br><i>Less is more (Secure): automated reduction of the attack surface in modern Browser</i>  | Nov. 2016 – June 2017<br>Boston, USA   |
| <ul style="list-style-type: none"><li>Investigated the Browser functionalities as potential attack surface</li><li>Instrumented the Browser functionalities to define the minimal set of required functionality</li><li>Generated a model able to reduce the Attack surface and increase the browser performance</li></ul>   |  |

## EDUCATION

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|---|---|
| <b>Ph.D. Computer Science   Cybersecurity</b><br>Northeastern University   GPA: 4.0/4.0     | Sep. 2019 – (Expected Feb. 2025)<br>Boston, USA |
| <b>Master in Computer Science and Engineering</b><br>Politecnico di Milano   Grade: 101/110 | Sep. 2014 – May 2018<br>Milano, Italy           |
| <b>Erasmus Experience</b><br>Universidad Complutense de Madrid (UCM)                        | Sep. 2015 – Feb. 2016<br>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

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

## CONFERENCES AND PRESENTATIONS

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

## PROFESSIONAL SERVICES / NETWORK

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

## SELECTED ACHIEVEMENT / GRANTS

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