Stefano Calzavara

Università Ca' Foscari Venezia, DAIS
via Torino, 155
30170 - Venezia Mestre, Italy

Phone: +39 041.2348463
Email: stefano.calzavara@unive.it
Homepage: www.dais.unive.it/~calzavara

Short Summary

Stefano Calzavara is a tenure-track assistant professor in Computer Science at Università Ca' Foscari Venezia, Italy. His research focuses on formal methods, computer security and their intersection, with a strong emphasis on web security. Stefano has published more than 40 papers on these topics at widely recognized international conferences and journals, including: IEEE S&P, ACM CCS, NDSS, USENIX Security, WWW, IEEE CSF, ESOP, ACM CSUR, ACM TOPLAS and ACM TWEB. According to Google Scholar, his h-index is 14 and his publications received more than 450 citations overall. He was pleased to serve in the program committees of a number of scientific events, including USENIX Security, WWW, IEEE EuroS&P and IEEE CSF.

Education

January 2010 - December 2012: **Ph.D.** in Computer Science, Università Ca' Foscari Venezia

September 2007 - October 2009: **M.A.** in Computer Science (summa cum laude), Università Ca' Foscari Venezia

September 2004 - October 2007: **B.A.** in Computer Science (summa cum laude), Università Ca' Foscari Venezia

Research Experience

November 2018 - now: **Assistant Professor** with tenure at Università Ca' Foscari Venezia

August 2015 - October 2018: **Postdoctoral Researcher** at Università Ca' Foscari Venezia

March 2015 - May 2015: **Postdoctoral Researcher** at Saarland University

March 2013 - February 2015: **Postdoctoral Researcher** at Università Ca' Foscari Venezia

Research Projects

I participated to the following research projects in collaboration with other universities and industrial partners:

2015 - 2018: PON ADAPT - Accessible Data for Accessible Proto-Types in Social Sector

2016 - 2017: MIUR-DAAD - Client-side Security Enforcement for Mobile and Web Applications

2013 - 2015: PRIN CINA - Compositionality, Interaction, Negotiation, Autonomicity

2010 - 2011: PRIN IPODS - Interacting Processes in Open-ended Distributed Systems

PC Memberships

I served (or will serve) in the program committees of the following conferences and workshops:

2021

USENIX Security Symposium

The Web Conference: Security, Privacy and Trust Track (WWW)

2020

USENIX Security Symposium

The Web Conference: Security, Privacy and Trust Track (WWW)

IEEE European Symposium on Security and Privacy (EuroS&P)

International Conference on Applied Cryptography and Network Security (ACNS)

Security and Trust Management (STM)

2019

USENIX Security Symposium

IEEE European Symposium on Security and Privacy (EuroS&P)

Formal Techniques for Distributed Objects, Components, and Systems (FORTE)

Security and Trust Management (STM)

IEEE Computer Society Signature Conference on Computers, Software and Applications

2018

IEEE European Symposium on Security and Privacy (EuroS&P)

Programming Languages and Analysis for Security (PLAS)

IEEE Computer Society Signature Conference on Computers, Software and Applications

Interaction and Concurrency Experience (ICE)

2017

IEEE Computer Security Foundations Symposium (CSF)

International Conference on Principles of Security and Trust (POST)

IEEE Computer Society Signature Conference on Computers, Software and Applications

Italian Conference on Cyber-Security (ITASEC)

Security and Privacy in Digital Advertising (SPA)

Interaction and Concurrency Experience (ICE)

2016

Security and Trust Management (STM)

Interaction and Concurrency Experience (ICE)

IEEE Computer Society Signature Conference on Computers, Software and Applications

International Conference on Advances in Cyber-Technologies and Cyber-Systems (CYBER)

2015

International Symposium on Engineering Secure Software and Systems (ESSoS)

IEEE Computer Society Signature Conference on Computers, Software and Applications

OWASP AppSec European Security Conference

PC Chairing & Editorships

I was the Program Chair of the SecWeb 2020 workshop (co-located with IEEE EuroS&P)

I was the Track Leader (Guest Editor) of the *Web Security* track at ESREL 2020 – PSAM 15

Awards

3rd place at the Applied Research competition of CSAW 2019 for the contribution *Postcards from the post-HTTP world* (presented at S&P 2019)

EA-TCS Best paper award at ETAPS 2013 for the contribution *Logical foundations of secure resource management in protocol implementations* (presented at POST 2013).

Teaching Activity

Starting from A.Y. 2019/2020, I am teaching the following courses:

Databases Mod. 2

Formal Languages and Computability

Security Mod. 2

Before my tenure, I taught a number of different courses at Università Ca' Foscari Venezia:

A.Y. 2018/19: Teacher for "Formal Languages and Computability" (6 CFUs)

A.Y. 2017/18: Teacher for "Formal Languages and Computability" (6 CFUs)

A.Y. 2016/17: Teacher for "Compilers" (6 CFUs)

A.Y. 2015/16: Teacher for "Compilers" (6 CFUs)

A.Y. 2014/15: Teaching assistant for "Discrete Mathematics" for part time students

A.Y. 2011/12: Teaching assistant for "Discrete Mathematics"

A.Y. 2010/11: Teaching assistant for "Discrete Mathematics"

A.Y. 2009/10: Teaching assistant for "Discrete Mathematics"

Talks

I was delighted to present my research work at several venues.

Invited Presentations

2019	Invited speaker at OWASP Italy - Talk on the topic "Testing for integrity flaws in web sessions"
	Invited speaker at the "International Summer School on Cyber Security" in Padua - Talk on the topic "Machine learning for web vulnerability detection"
	Invited speaker at Forum Numerica (Sophia Antipolis) - Talk on the topic "Enforcing session integrity in the Wild Wild Web"
2018	Invited speaker at Dagstuhl Seminar on Web Application Security - Talk on the topic "REASON: A programmable architecture for secure browsing"
	Invited speaker at The Web Conference (Journal Track) - Talk on the topic "Surviving the Web: a journey into web session security"
	Invited speaker at ISACA Conference on Application Security and Modern Technologies - Talk on the topic "Testing for integrity flaws in web sessions"
	Visiting at INRIA Sophia Antipolis - Talk on the topic "Testing for integrity flaws in web sessions" (invited by Nataliia Bielova and Tamara Rezk)
2016	Invited speaker at Chalmers web security workshop - Talk on the topic "Theory and practice of Content Security Policy" (invited by Andrei Sabelfeld)
2014	Invited speaker at the ISACA Conference on Application Security and Modern Technologies - Talk on the topic "Client-side defenses for web authentication"
	Visiting at INRIA Paris - Talk on the topic "A formal investigation on web session security" (invited by Karthikeyan Bhargavan)
	Visiting at Saarland University - Talk on the topic "Formalizing and enforcing web session integrity" (invited by Matteo Maffei)

Conference Presentations

2019	Speaker at European Symposium on Research in Computer Security (ESORICS) - Presentation of the paper "Testing for integrity flaws in web sessions"

Speaker at IEEE European Symposium on Security & Privacy (EuroS&P) - Presentation of the paper "Mitch: A machine learning approach to the black-box detection of CSRF vulnerabilities"

Speaker at IEEE Symposium on Security & Privacy (S&P) - Presentation of the paper "Postcards from the post-HTTP world: Amplification of HTTPS vulnerabilities in the web ecosystem"

2017	Speaker at USENIX Security Symposium - Presentation of the paper "CCSP: Controlled relaxation of content security policies by runtime policy composition"
2016	Speaker at ACM Conference on Computer and Communications Security (CCS) - Presentation of the paper "Content Security Problems? Evaluating the effectiveness of Content Security Policy in the wild"
	Speaker at Italian Conference on Cybersecurity (ITASEC) - Talk on the topic "Content Security Policy: a broken promise?"
2015	Speaker at IEEE Computer Security Foundations Symposium (CSF) - Presentation of the paper "Compositional typed analysis of ARBAC policies"
	Speaker at European Symposium on Programming (ESOP) - Presentation of the paper "Fine-grained detection of privilege escalation attacks on browser extensions"
	Speaker at International Symposium on Engineering Secure Software and Systems (ESSoS) - Presentation of the paper "Formal verification of Liferay RBAC"
2014	Speaker at IEEE Computer Security Foundations Symposium (CSF) - Presentation of the paper "Provably sound browser-based enforcement of web session integrity"
	Speaker at International World Wide Web Conference (WWW) - Presentation of the paper "Quite a mess in my cookie jar! Leveraging machine learning to protect web authentication"
2013	Speaker at IFIP Joint International Conference on Formal Techniques for Distributed Systems (FORTE/FMOODS) - Presentation of the paper "Lintent: towards security type-checking of Android applications"
	Speaker at Principles of Security and Trust (POST) - Presentation of the paper "Logical foundations of secure resource management in protocol implementations"
2012	Speaker at IEEE Computer Security Foundations Symposium (CSF) - Presentation of the paper "Gran: model checking grsecurity RBAC policies"
2010	Speaker at Automated Reasoning for Security Protocol Analysis and Issues in the Theory of Security (ARSPA-WITS) - Presentation of the paper "Secrecy and authenticity types for secure distributed messaging"

Publications

Journal Articles

2020	Calzavara, S., Conti, M., Focardi, R., Rabitti, A., and Tolomei, G. (2020a). Machine learning for web vulnerability detection: The case of cross-site request forgery. *IEEE Secur. Priv.*, 18(3):8–16
2019	Calzavara, S., Rabitti, A., and Bugliesi, M. (2019e). Sub-session hijacking on the web: Root causes and prevention. *Journal of Computer Security*, 27(2):233–257
2018	Calzavara, S., Rabitti, A., and Bugliesi, M. (2018d). Semantics-based analysis of content security policy deployment. *TWEB*, 12(2):10:1–10:36
2017	Calzavara, S., Focardi, R., Squarcina, M., and Tempesta, M. (2017a). Surviving the web: A journey into web session security. *ACM Comput. Surv.*, 50(1):13:1–13:34
	Bugliesi, M., Calzavara, S., and Focardi, R. (2017). Formal methods for web security. *J. Log. Algebr. Meth. Program.*, 87:110–126
2016	Bugliesi, M., Calzavara, S., Mödersheim, S., and Modesti, P. (2016). Security protocol specification and verification with anbx. *J. Inf. Sec. Appl.*, 30:46–63
2015	Bugliesi, M., Calzavara, S., Focardi, R., and Khan, W. (2015b). Cookiext: Patching the browser against session hijacking attacks. *Journal of Computer Security*, 23(4):509–537
	Calzavara, S., Tolomei, G., Casini, A., Bugliesi, M., and Orlando, S. (2015d). A supervised learning approach to protect client authentication on the web. *TWEB*, 9(3):15
	Bugliesi, M., Calzavara, S., Eigner, F., and Maffei, M. (2015a). Affine refinement types for secure distributed programming. *ACM Trans. Program. Lang. Syst.*, 37(4):11

Conference Papers

2020	Calzavara, S., Focardi, R., Grimm, N., Maffei, M., and Tempesta, M. (2020b). Language-based web session integrity. In *33rd IEEE Computer Security Foundations Symposium, CSF 2020, Boston, MA, USA, June 22-26, 2020*, pages 107–122. IEEE

Calzavara, S., Focardi, R., Rabitti, A., and Soligo, L. (2020c). A hard lesson: Assessing the HTTPS deployment of italian university websites. In Loreti, M. and Spalazzi, L., editors, *Proceedings of the Fourth Italian Conference on Cyber Security, Ancona, Italy, February 4th to 7th, 2020*, volume 2597 of *CEUR Workshop Proceedings*, pages 93–104. CEUR-WS.org

Roth, S., Barron, T., Calzavara, S., Nikiforakis, N., and Stock, B. (2020). Complex security policy? A longitudinal analysis of deployed content security policies. In *27th Annual Network and Distributed System Security Symposium, NDSS 2020, San Diego, California, USA, February 23-26, 2020*. The Internet Society

2019   Calzavara, S., Lucchese, C., and Tolomei, G. (2019c). Adversarial training of gradient-boosted decision trees. In Zhu, W., Tao, D., Cheng, X., Cui, P., Rundensteiner, E. A., Carmel, D., He, Q., and Yu, J. X., editors, *Proceedings of the 28th ACM International Conference on Information and Knowledge Management, CIKM 2019, Beijing, China, November 3-7, 2019*, pages 2429–2432. ACM

Calzavara, S., Rabitti, A., Ragazzo, A., and Bugliesi, M. (2019f). Testing for integrity flaws in web sessions. In *Computer Security - ESORICS 2019 - 24th European Symposium on Research in Computer Security, Luxembourg, September 23-27, 2019, Proceedings, Part II*, pages 606–624

Calzavara, S., Conti, M., Focardi, R., Rabitti, A., and Tolomei, G. (2019a). Mitch: A machine learning approach to the black-box detection of CSRF vulnerabilities. In *IEEE European Symposium on Security and Privacy, EuroS&P 2019, Stockholm, Sweden, June 17-19, 2019*, pages 528–543

Calzavara, S., Focardi, R., Nemec, M., Rabitti, A., and Squarcina, M. (2019b). Postcards from the post-http world: Amplification of HTTPS vulnerabilities in the web ecosystem. In *2019 IEEE Symposium on Security and Privacy, SP 2019, San Francisco, CA, USA, May 19-23, 2019*, pages 281–298

Calzavara, S., Rabitti, A., and Bugliesi, M. (2019d). Semantically sound analysis of content security policies. In *Formal Techniques for Distributed Objects, Components, and Systems - 39th IFIP WG 6.1 International Conference, FORTE 2019, Held as Part of the 14th International Federated Conference on Distributed Computing Techniques, DisCoTec 2019, Kongens Lyngby, Denmark, June 17-21, 2019, Proceedings*, pages 293–297

2018   Calzavara, S., Focardi, R., Maffei, M., Schneidewind, C., Squarcina, M., and Tempesta, M. (2018a). WPSE: fortifying web protocols via browser-side security monitoring. In *27th USENIX Security Symposium, USENIX Security 2018, Baltimore, MD, USA, August 15-17, 2018.*, pages 1493–1510

Calzavara, S., Focardi, R., Squarcina, M., and Tempesta, M. (2018b). Surviving the web: A journey into web session security (extended abstract). In *Companion of the The Web Conference 2018 on The Web Conference 2018, WWW 2018, Lyon , France, April 23-27, 2018*, pages 451–455

Calzavara, S., Rabitti, A., and Bugliesi, M. (2018c). Dr Cookie and Mr Token - Web session implementations and how to live with them. In *Proceedings of the Second Italian Conference on Cyber Security, Milan, Italy, February 6th - to - 9th, 2018.*

2017   Calzavara, S., Rabitti, A., and Bugliesi, M. (2017c). CCSP: controlled relaxation of content security policies by runtime policy composition. In *26th USENIX Security Symposium, USENIX Security 2017, Vancouver, BC, Canada, August 16-18, 2017.*, pages 695–712

Calzavara, S., Grishchenko, I., Koutsos, A., and Maffei, M. (2017b). A sound flow-sensitive heap abstraction for the static analysis of android applications. In *30th IEEE Computer Security Foundations Symposium, CSF 2017, Santa Barbara, CA, USA, August 21-25, 2017*, pages 22–36

2016   Calzavara, S., Rabitti, A., and Bugliesi, M. (2016c). Content security problems?: Evaluating the effectiveness of content security policy in the wild. In *Proceedings of the 2016 ACM SIGSAC Conference on Computer and Communications Security, Vienna, Austria, October 24-28, 2016*, pages 1365–1375

Calzavara, S., Rabitti, A., Steffinlongo, E., and Bugliesi, M. (2016d). Static detection of collusion attacks in ARBAC-based workflow systems. In *IEEE 29th Computer Security Foundations Symposium, CSF 2016, Lisbon, Portugal, June 27 - July 1, 2016*, pages 458–470

Calzavara, S., Focardi, R., Grimm, N., and Maffei, M. (2016a). Micro-policies for web session security. In *IEEE 29th Computer Security Foundations Symposium, CSF 2016, Lisbon, Portugal, June 27 - July 1, 2016*, pages 179–193

Calzavara, S., Grishchenko, I., and Maffei, M. (2016b). HornDroid: Sound and practical static analysis of Android applications by SMT solving. In *IEEE European Symposium on Security and Privacy, EuroS&P 2016, Saarbrücken, Germany, March 21-24, 2016*, pages 47–62

2015   Calzavara, S., Rabitti, A., and Bugliesi, M. (2015b). Compositional typed analysis of ARBAC policies. In *IEEE 28th Computer Security Foundations Symposium, CSF 2015, Verona, Italy, 13-17 July, 2015*, pages 33–45

Calzavara, S., Bugliesi, M., Crafa, S., and Steffinlongo, E. (2015a). Fine-grained detection of privilege escalation attacks on browser extensions. In *Programming Languages and Systems - 24th European Symposium on Programming, ESOP 2015, Held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2015, London, UK, April 11-18, 2015, Proceedings*, pages 510–534

Calzavara, S., Rabitti, A., and Bugliesi, M. (2015c). Formal verification of Liferay RBAC. In *Engineering Secure Software and Systems - 7th International Symposium, ESSoS 2015, Milan, Italy, March 04-06, 2015, Proceedings*

2014   Khan, W., Calzavara, S., Bugliesi, M., Groef, W. D., and Piessens, F. (2014). Client side web session integrity as a non-interference property. In *Information Systems Security - 10th International Conference, ICISS 2014, Hyderabad, India, December 16-20, 2014, Proceedings*, pages 89–108

Bugliesi, M., Calzavara, S., Focardi, R., Khan, W., and Tempesta, M. (2014b). Provably sound browser-based enforcement of web session integrity. In *IEEE 27th Computer Security Foundations Symposium, CSF 2014, Vienna, Austria, 19-22 July, 2014*, pages 366–380

Calzavara, S., Tolomei, G., Bugliesi, M., and Orlando, S. (2014). Quite a mess in my cookie jar! Leveraging machine learning to protect web authentication. In *23rd International World Wide Web Conference, WWW '14, Seoul, Republic of Korea, April 7-11, 2014*, pages 189–200

Bugliesi, M., Calzavara, S., Focardi, R., and Khan, W. (2014a). Automatic and robust client-side protection for cookie-based sessions. In *Engineering Secure Software and Systems - 6th International Symposium, ESSoS 2014, Munich, Germany, February 26-28, 2014, Proceedings*, pages 161–178

2013   Bugliesi, M., Calzavara, S., and Spanò, A. (2013b). Lintent: Towards security type-checking of android applications. In *Formal Techniques for Distributed Systems - Joint IFIP WG 6.1 International Conference, FMOODS/FORTE 2013, Held as Part of the 8th International Federated Conference on Distributed Computing Techniques, DisCoTec 2013, Florence, Italy, June 3-5, 2013. Proceedings*, pages 289–304

Bugliesi, M., Calzavara, S., Eigner, F., and Maffei, M. (2013a). Logical foundations of secure resource management in protocol implementations. In *Principles of Security and Trust - Second International Conference, POST 2013, Held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2013, Rome, Italy, March 16-24, 2013. Proceedings*, pages 105–125

2012   Bugliesi, M., Calzavara, S., Focardi, R., and Squarcina, M. (2012b). Gran: Model checking grsecurity RBAC policies. In *25th IEEE Computer Security Foundations Symposium, CSF 2012, Cambridge, MA, USA, June 25-27, 2012*, pages 126–138

Bugliesi, M., Calzavara, S., Eigner, F., and Maffei, M. (2012a). Affine refinement types for authentication and authorization. In *Trustworthy Global Computing - 7th International Symposium, TGC 2012, Newcastle upon Tyne, UK, September 7-8, 2012, Revised Selected Papers*, pages 19–33

2011   Bugliesi, M., Calzavara, S., Eigner, F., and Maffei, M. (2011). Resource-aware authorization policies for statically typed cryptographic protocols. In *Proceedings of the 24th IEEE Computer Security Foundations Symposium, CSF 2011, Cernay-la-Ville, France, 27-29 June, 2011*, pages 83–98

2010   Bugliesi, M., Calzavara, S., and Macedonio, D. (2010). Secrecy and authenticity types for secure distributed messaging. In *Automated Reasoning for Security Protocol Analysis and Issues in the Theory of Security - Joint Workshop, ARSPA-WITS 2010, Paphos, Cyprus, March 27-28, 2010. Revised Selected Papers*, pages 23–40

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