Dr. Thomas Barber - CV

Experienced Security Researcher and Software developer with a passion for digging into, understanding and solving problems in complex systems.

LinkedIn / GitHub / Google Scholar

Professional Experience

Research Expert @ SAP SE *(Feb 2019 - Present)*

- Industrial research into novel techniques in the field of vulnerability detection, active defense and threat monitoring for web applications.
- Developed methods for the detection and prevention of cybersecurity vulnerabilties for interpreted languages (e.g. JavaScript, Java).
- Applied techniques to privacy use-cases such as automating GDPR compliance for legacy applications, and high-accuracy detection of browser fingerprinting.
- Publication of results in top security conferences and transfer of prototypes into SAP Lines of Business.
- Active involvement in public funded projects: Principle investigator @ ENCOPIA and researcher @ TESTABLE.
- Supervision of PhD and Master's students and international collaboration with external partners from industry and academia.

Senior Software Developer @ Intel *(May 2014 - Feb 2019)*

- Designed security software for next-generation automotive infotainment and software-defined cockpit platforms.
- Developed key storage solutions in trusted execution environments such as the Linux kernel and Intel SGX.
- Digital Rights Management solutions such as Widevine and HDCP.
- Security Champion for the Transportation Solutions Division.
- Scrum master for the Automotive Security team.

Software Developer @ Vector *(Jan 2013 - Apr 2014)*

- Automotive firmware developer with a focus on the XCP remote calibration protocol over ethernet.
- Designed and implemented an automated continuous regression test system to provide continuous integration of new features.

Postdoctoral Researcher @ University of Freiburg *(Nov 2010 - Dec 2012)*

- Analysed the first particle collision data from the ATLAS experiment at CERN to search for new Supersymmetric particles beyond the current Standard Model.
- Engaged in Research and Development activities for the next generation of silicon-based particle detectors, including novel radiation detection systems.

Open Source Projects

- **Lead developer and maintainer** of Project Foxhound, an instrumented fork of the Firefox browser for security testing (Listen to the podcast!).
- **Developer** of Fontus, a bytecode rewriting engine for security and privacy policy enforcement.
- **Lead developer** of the Sanitizer Checker, a symbolic string analysis framework to evaluate the security of sanitization functions.

Education

PhD Experimental Particle Physics @ University of Cambridge *(2006-2010)*

- Topic: New physics searches in the ZZ sector with the ATLAS experiment
- Wrote C++/Python algorithms to process and analyze data from the LHC @ CERN
- Development of embedded readout software for the Data Acquistion System of the ATLAS Semiconductor Tracker

MSc. Natural Sciences @ University of Cambridge *(2001-2005)*

- Subjects: Maths, Advanced Physics
- Result: **First** *(Outstanding)*

GCE A-Levels @ King Edward VI Grammar School *(1994-2001)*

- Maths, Physics, Chemistry, Music, General Studies
- Results: **All grade A** *(Outstanding)*

Patents

- Taint tracking via non-intrusive bytecode instrumentation: US11526600B2
- Security Vulnerability Detection: US20230177166A1
- String Sanitizer Modeling: US20230252159A1

Publications

A selected list of publications is shown below. A full list is available on Google Scholar.

- **FP-tracer: Fine-grained Browser Fingerprinting Detection via Taint-tracking and Entropy-based Thresholds**, Soumaya Boussaha et al. *Proceedings on Privacy Enhancing Technologies, 2024 (PoPETS '24)* (pdf)

- **The Great Request Robbery: An Empirical Study of Client-side Request Hijacking Vulnerabilities on the Web**, Soheil Khodayari, Thomas Barber and Giancarlo Pellegrino. *Proceedings of 45th IEEE Symposium on Security and Privacy, 2024 (S&P '24)* (pdf, video)
- **General Data Protection Runtime: Enforcing Transparent GDPR Compliance for Existing Applications**, David Klein, Benny Rolle, Thomas Barber, Manuel Karl, and Martin Johns. *Proceedings of the 2023 ACM SIGSAC Conference on Computer and Communications Security (CCS '23)* (pdf)
- **Hand Sanitizers in the Wild: A Large-scale Study of Custom JavaScript Sanitizer Functions**, David Klein, Thomas Barber, Souphiane Bensalim, Ben Stock, Martin Johns, *7th IEEE European Symposium on Security and Privacy (EuroS&P 2022)* (pdf)

Skills and Expertise

- Programming Skills: C/C++, Python, Java, JavaScript, C#
- Enviornments: Linux, Windows, Docker, Git, Jenkins
- Languages: English *(native)*, German *(working proficiency)*, French *(basic)*

Awards

- **Distinguished Paper Award** @ IEEE S&P *(2024)* for our paper on Client-Side Request Hijacking
- **Spot Awards** @ SAP *(2020, 2021, 2023)* for outstanding performance.
- **Divisional Recognition Awards** @ Intel *(2018)* for designing and implementing a software solution to meet strict customer deadlines.
- **Doncaster Prize** @ Univesity of Cambridge *(2005)* for exam results in Natural Sciences.
- **Cormack Scholarship** @ University of Edinburgh *(2004)* for best summer student project in astrophysics.

Hobbies

- Triathlon (Running, Cycling, Swimming)
- Music (Singer @ Bachchor, Piano)

THOMASBARBER

TMBRBR

GOOGLE SCHOLAR

An online version of this resume is available as HTML / PDF / Markdown