

Dr.-Ing. Aurore Fass

Tenure-Track Faculty at CISPA

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## Research Overview

My research work revolves around designing practical approaches to protect the security and privacy of Web users. I build systems to proactively detect malicious JavaScript code and suspicious browser extensions. I analyze data to understand how people spend time on the Web, and I want to use the resulting perspective to prioritize defense strategies.

## Scientific Career

- 2023– **Tenure-Track Faculty**, *CISPA Helmholtz Center for Information Security*, Germany
- 2021–2023 **Visiting Assistant Professor**, *Stanford University*, U.S
  - Host: [Zakir Durumeric](#)
- 2021 **Postdoctoral Researcher**, *CISPA Helmholtz Center for Information Security*, Germany
- 2017–2021 **Ph.D. Student**, *Saarland University & CISPA Helmholtz Center for Information Security*, Germany
  - Ph.D. thesis: *Studying JavaScript Security Through Static Analysis*
  - Advisors: [Michael Backes](#) and [Ben Stock](#)

## Education

- 2014–2017 **Grande École** (similar to a Master Degree), *TELECOM Nancy*, France, valedictorian
  - Major: Telecommunication, Network, and Security
  - Master thesis: German Federal Office for Information Security (BSI), Germany
    - Automated clustering of JS samples for the detection of malware contained in obfuscated code
  - Industrial project: French Ministry of Defense, France
    - Implemented an Xposed module to monitor Android devices; group of 4 persons (6 months)
  - Internship: Fraunhofer IOSB, Germany
    - Implemented a passive asset detection system (8 weeks)
- 2012–2014 **Preparation for the highly competitive nationwide entrance examination to the French Grandes Écoles**, France
  - Major: Mathematics, Physics, and Computer Science
- 2012 **High school graduation**, France, graduated with distinction (“mention très bien”), European section
  - Major: Mathematics, Physics & Chemistry, Biology, and German

## Awards and Honors

- 2023 **Top Reviewer Award**, *ACSAC*
- 2023 **Top Reviewer Award**, *ACM CCS*

- 2022 **Top Reviewer Award**, *ACM CCS*
- 2022 **PC Member Honorable Mention**, *TheWebConf*
- 2021 **Inspiring Career Recognition**, 1 of 3 invited alumni (out of 2,300 alumni) for the 30<sup>th</sup> anniversary of the French Grande École TELECOM Nancy, Remote
- 2019–2022 **Program of Excellence**, Saarland University, Germany
- 2017 **Valedictorian**, French Grande École TELECOM Nancy, France
- 2016 **Best Student Recognition Event**, IBM, UK

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## Publications

Sheryl Hsu, Manda Tran, and **Aurore Fass**. [What is in the Chrome Web Store?](#) In *ACM AsiaCCS*, 2024.

Liz Izhikevich, Manda Tran, Michalis Kallitsis, **Aurore Fass**, and Zakir Durumeric. [Cloud Watching: Understanding Attacks Against Cloud-Hosted Services](#). In *ACM Internet Measurement Conference (IMC)*, 2023.

Kimberly Ruth, **Aurore Fass**, Jonathan J. Azose, Mark Pearson, Emma Thomas, Caitlin Sadowski, and Zakir Durumeric. [A World Wide View of Browsing the World Wide Web](#). In *ACM Internet Measurement Conference (IMC)*, 2022.

**Aurore Fass**, Dolière Francis Somé, Michael Backes, and Ben Stock. [DOUBLEX: Statically Detecting Vulnerable Data Flows in Browser Extensions at Scale](#). In *ACM CCS*, 2021. Code repository: <https://github.com/Aurore54F/DoubleX>.

Marvin Moog, Markus Demmel, Michael Backes, and **Aurore Fass**. [Statically Detecting JavaScript Obfuscation and Minification Techniques in the Wild](#). In *Dependable Systems and Networks (DSN)*, 2021. Code repository: <https://github.com/MarM15/js-transformations>.

**Aurore Fass**, Michael Backes, and Ben Stock. [HIDENOSEEK: Camouflaging Malicious JavaScript in Benign ASTs](#). In *ACM CCS*, 2019. Code repository: <https://github.com/Aurore54F/HideNoSeek>.

**Aurore Fass**, Michael Backes, and Ben Stock. [JSTAP: A Static Pre-Filter for Malicious JavaScript Detection](#). In *ACSAC*, 2019. Code repository: <https://github.com/Aurore54F/JStap>.

**Aurore Fass**, Robert P. Krawczyk, Michael Backes, and Ben Stock. [JAST: Fully Syntactic Detection of Malicious \(Obfuscated\) JavaScript](#). In *DIMVA*, 2018. Code repository: <https://github.com/Aurore54F/JaSt>.

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## Community Services

**PC Co-Chair** [MADWeb 2024 & 2023](#) (co-located with NDSS)

**PC Member** ACM CCS 2024–2021, USENIX Security 2024, IEEE EuroS&P 2024 & 2023, ACSAC 2024 & 2023, IEEE S&P 2023, TheWebConf 2023 & 2022, ARES 2023 & 2022, SecWeb 2024–2021

**Artifact Committee** USENIX Security 2021, ACSAC 2018

**External Reviewer** IEEE S&P 2024, TWEB 2024, ESORICS 2023, ICCCN 2023, NDSS 2022–2020, USENIX Security 2022–2020, IEEE EuroS&P 2019, ACSAC 2019 & 2018, ACM CCS 2018

<b>Hiring Committee</b>	CISPA Faculty Hiring Committee 2021
<b>Doctoral Committee</b>	Romain Fouquet (Ph.D., Computer Science, Université de Lille, May 2023)
<b>Project Proposal</b>	Reviewed projects for several European funding organizations
<b>Misc</b>	ACM CCS Workshop Chair 2024, IMC Travel Grants 2023

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## Teaching

- SS 2024 **The Web Security Seminar**
- WS 2023–2024 **The Web Security Seminar**
- Malicious JavaScript Analysis
  - Beyond Malicious Extensions: How can Extensions put User Security & Privacy at Risk?
  - User Browsing Behavior vs. Top Lists
- WS 2020–2021 **Lecturer at TELECOM Nancy** (Université de Lorraine, France)
- Browser Extensions: Architecture and Security Consideration (lectures and practicals for MSc students)
- WS 2019–2020 **Seminar: Joint Advances in Web Security**
- Browser Extensions: Security and Vulnerabilities
  - Overview of Malicious JavaScript Detection Techniques and Attacks
- WS 2018–2019 **Seminar: Joint Advances in Web Security**
- Overview of Malicious JavaScript Detection Techniques
  - Cryptojacking: Definition, Detection, and Dimensions

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## Advising and Mentoring

### PostDoctoral Researchers

May 2024– **Dr. Ying Yuan** – *Phishing, JavaScript, Browser Extension Security*, CISPA

### Ph.D. Students

- Apr 2024– **Valentino Dalla Valle** – *Fingerprinting, Browser Extension Security*, Saarland University & CISPA
- Dec 2023– **Dominic Troppmann** – *Type Checks*, with Cristian-Alexandru Staicu, Saarland University & CISPA
- Nov 2021– **Shubham Agarwal** (Ph.D. student of Ben Stock) – *Browser Extension Security*, Saarland University & CISPA
- Oct 2021– **Kimberly Ruth** (Ph.D. student of Zakir Durumeric) – *Web Browsing Behavior*, Stanford University

### Bachelor Students

- Oct 2023– **Ben Rosenzweig** (BSc thesis) – *Machine Learning-Based Approach for Detecting Malicious Browser Extensions*, Saarland University

## Alumni

- 2022–2023 **Sheryl Hsu** (BSc student) – *Browser Extension Security* → *AsiaCCS 2024*, Stanford University  
**Manda Tran** (MSc student) – *Browser Extension Security* → *AsiaCCS 2024*, Stanford University
- 2022 **Mark Tran** (BSc student) – *Browser Extension Fingerprinting*, Stanford University  
**Vrushank Gunjur** (BSc student) – *Over-Privileged Extensions*, Stanford University  
**Nahum Maru** (BSc student) – *Browser Extension Crawler*, Stanford University  
**Fengchen (Maggie) Gong** (MSc student → Princeton Ph.D.) – *Fingerprinting*, Stanford University
- 2021 **Liana Patel** (Ph.D. student of Zakir Durumeric) – *Crawler*, Stanford University  
**Luca Pistor & Nathan Bhak** (BSc students) – *Exam Software Security*, Stanford University  
**Paul Szymanski** (BSc thesis) – *A Study of State-of-the-Art Call Graph Creation Approaches for JavaScript*, with Cristian-Alexandru Staicu, Saarland University & CISPA
- 2020 **Anne Christin Deutschen & Luc Seyler** (BSc students) – *Browser Extension Vulnerability*, with Dolière Francis Somé, Saarland University & CISPA
- 2019–2020 **Marvin Moog & Markus Demmel** (BSc students) – *Analysis of JavaScript Obfuscation Techniques* → *DSN 2021*, Saarland University & CISPA
- 2019 **Maximilian Zöllner & Niklas Kempf** (BSc students) – *Intelligent Fuzzing System for JavaScript*, Saarland University & CISPA
- 2018 **Nils Glörfeld** (BSc student) – *Malicious JavaScript Deobfuscation*, Saarland University & CISPA  
**Dennis Salzmann** (BSc student) – *Malicious JavaScript Detection*, Saarland University & CISPA

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## Invited Talks

### Browser Extension (In)Security

Jun 2024 [GDR Information Security](#). Rennes, France.

### [DOUBLEX: Statically Detecting Vulnerable Data Flows in Browser Extensions](#)

Nov 2023 Workshop at INRIA. Paris, France.

Jul 2022 [Berkeley Security Seminar](#). Berkeley, CA, U.S.

May 2022 [RuhrSec](#). Bochum, Germany (extended version).

Apr 2022 [Stanford Computer Forum – Security Workshop](#). Stanford, CA, U.S.

Nov 2021 [Stanford Security Lunch](#). Stanford, CA, U.S.

### [Studying JavaScript Security Through Static Analysis](#)

Apr 2024 [PEPR Cyber – Project DefMal Webinar](#) (France). Remote (extended version).

Mar 2022 [Palo Alto Networks](#) (CA, U.S.). Remote (extended version).

Jun 2021 [Spirals Webinar at Inria Lille](#) (France). Remote.

## Statically Analyzing Malicious JavaScript in the Wild

- Mar 2021 Webinar at LORIA (France). Remote.
- Dec 2020 BINSEC Webinar at CEA (France). Remote.

## HIDENOSEEK: Camouflaging Malicious JavaScript in Benign ASTs

- May 2020 RuhrSec (Germany). Remote (extended version).
- Mar 2019 Grande Region Security and Reliability Day (GRSRD). Nancy, France.
- Feb 2019 MADWeb. San Diego, CA, U.S.

## JAST: Fully Syntactic Detection of Malicious (Obfuscated) JavaScript

- Nov 2018 Blackhoodie. Berlin, Germany.
- Jun 2018 Malware Meeting at LORIA. Nancy, France.
- Mar 2018 Grande Region Security and Reliability Day (GRSRD). Saarbrücken, Germany.

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## Publicly Available Software

- `static-pdg-js` Static analysis of JavaScript code (AST, control & data flows, pointer analysis)
- `DOUBLEX` Static browser extension analyzer: detection of suspicious external data flows
- `HIDENOSEEK` Static analyzer to detect syntactic clones in JavaScript inputs
- `JSTAP` Static and modular malicious JavaScript detector
- `JAST` Static malicious JavaScript detector
- `reimpl-cujo` Reimplementation of `Cujo`, static malicious JavaScript detector
- `reimpl-zozzle` Reimplementation of `Zozzle`, static malicious JavaScript detector

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## Additional Skills – Languages

- French Mother tongue
- English Trilingual proficiency *TOEIC score: 910 (2014); lived in the U.S. 2021–2023*
- German Trilingual proficiency *C1 Certificate (2016); lived in Germany 2017–2021 & 2023 onwards*