

# PETERSON YUHALA

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| ACADEMIC POSITION   | <b>Postdoctoral Research Fellow, Department of Computer Science</b><br>Systopia Lab<br>Department of Computer Science, <i>University of British Columbia</i> , Vancouver, Canada                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | April 2026 – Present                                                                                                                                                                      |
| INTERESTS           | Confidential computing and trusted execution environments (TEEs); processing-in-memory; systems security; privacy-preserving computation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                           |
| EDUCATION           | <b>Ph.D. in Computer Science</b><br><i>University of Neuchâtel, Switzerland</i><br>Thesis: <b>Enhancing Security and Performance in Trusted Execution Environments</b><br>Advisors: Pascal Felber, Valerio Schiavoni, Alain Tchana<br>Nominated for a Best Thesis Award<br><b>Masters of Engineering in Computer Science</b><br><i>National Advanced School of Engineering (ENSP), Yaoundé, Cameroon</i><br>Thesis: <b>Memory address translation optimization in virtualized systems</b><br>Advisor: Alain Tchana                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | April 2019 – March 2024<br><br><br><br><br><br><br><br>Sept. 2013 – Sept. 2018                                                                                                            |
| RESEARCH EXPERIENCE | <b>University of British Columbia, Vancouver, Canada</b><br><i>Systopia Lab, Postdoctoral Fellow</i> <ul style="list-style-type: none"><li>Hardware-based security for processing-in-memory (PIM) architectures</li><li>Side-channel attacks and mitigations in PCIe-based interconnects</li></ul> <b>University of Neuchâtel, Switzerland</b><br><i>Computer Science Institute / collaboration with ABB Corporate Research, Postdoctoral Researcher</i> <ul style="list-style-type: none"><li>Accelerating homomorphic encryption algorithms with PIM</li><li>Securing real-time applications with trusted execution environments (TEEs)</li></ul> <b>University of Neuchâtel, Switzerland</b><br><i>Computer Science Institute, Research Assistant / Ph.D. Candidate</i> <ul style="list-style-type: none"><li>Program partitioning for TCB reduction in TEE programs</li><li>Adding TEE support in GraalVM CE for sensitive data protection in the cloud</li><li>IoT security and privacy with TEEs and machine learning</li></ul> <b>Toulouse Institute of Computer Science Research (IRIT), France</b><br><i>Research Intern</i> <ul style="list-style-type: none"><li>Memory address translation optimization in virtualization systems</li></ul> | April 2026 – Present<br><br><br><br><br><br><br><br>April 2024 – March 2026<br><br><br><br><br><br><br><br>April 2019 – March 2024<br><br><br><br><br><br><br><br>March 2018 – Sept. 2018 |
| AWARDS              | <ul style="list-style-type: none"><li>Postdoctoral Fellowship, Swiss National Science Foundation (CHF 112,000 / \$138,000) 2026</li><li>Certificate of Appreciation, excellent service in all three cycles of ASPLOS’24 Artifact Evaluation 2024</li><li>Research Intern Scholarship, Campus France 2018</li><li>Salutatorian, Computer Engineering class of 2018, ENSP Yaoundé 2018</li><li>Valedictorian, Class of 2013, Sacred Heart College 2013</li><li>Ralph C. Okwen Award, overall best high school science student, Sacred Heart College 2013</li><li>2nd Award, Academic Excellence Award for a perfect score at the Cameroon GCE A-Level 2013</li><li>1st Award, Academic Excellence Award for a perfect score at the Cameroon GCE O-Level 2011</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                           |
| PUBLICATIONS        | 1. Andrei Arusoae, Claudiu-Nicu Bărbieru, Oana-Otilia Captarencu, Pascal Felber, Corentin Libert, Emanuel Onica, Etienne Rivière, Valerio Schiavoni, <b>Peterson Yuhala. Where to Place Your TEE? In Search of a Censorship-Resilient Design for Rollup Sequencers.</b> <i>Proceedings of the 29th</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                           |

*International Conference on Principles of Distributed Systems (OPODIS), 2025*

2. Niklas Klinger, Jonas Sander, **Peterson Yuhala**, Pascal Felber, Thomas Eisenbarth. **DRAMatic Speedup: Accelerating HE Operations on a Processing-in-Memory System**. *IACR Communications in Cryptology 3.1*, 2026
3. **Peterson Yuhala**, Mpoki Mwaïselä, Pascal Felber, Valerio Schiavoni. **PIM-CACHE: High-Efficiency Content-Aware Copy for Processing-In-Memory**. *Proceedings of the 27th ACM/IFIP International Middleware Conference*, 2026
4. Romain de Laage, **Peterson Yuhala**, François-Xavier Wicht, Pascal Felber, Christian Cachin, Valerio Schiavoni. **Practical Secure Aggregation by Combining Cryptography and Trusted Execution Environments**. *Proceedings of the 19th ACM International Conference on Distributed and Event-based Systems (DEBS)*, 2025
5. Mpoki Mwaïselä, **Peterson Yuhala**, Pascal Felber, Valerio Schiavoni. **IM-PIR: In-Memory Private Information Retrieval**. *Proceedings of the 26th ACM/IFIP International Middleware Conference*, 2025
6. **Peterson Yuhala**, Christian Göttel, Jämes Ménétrey, Valerio Schiavoni, David Kozhaya, Pascal Felber. **On Real-Time Guarantees in Intel SGX and TDX**. *Proceedings of the 37th Euromicro Conference on Real-Time Systems (ECRTS)*, 2025
7. Mpoki Mwaïselä, Joel Hari, **Peterson Yuhala**, Jämes Ménétrey, Pascal Felber, Valerio Schiavoni. **Evaluating the Potential of In-Memory Processing to Accelerate Homomorphic Encryption**. *Proceedings of the 43rd International Symposium on Reliable Distributed Systems (SRDS)*, 2024
8. **Peterson Yuhala**, Jämes Ménétrey, Pascal Felber, Marcelo Pasin, Valerio Schiavoni. **Fortress: Securing IoT Peripherals with Trusted Execution Environments**. *Proceedings of the 39th ACM/SIGAPP Symposium on Applied Computing (SAC)*, 2024
9. Jämes Ménétrey, Aeneas Grüter, **Peterson Yuhala**, Julius Oeftiger, Pascal Felber, Marcelo Pasin, Valerio Schiavoni. **A Holistic Approach for Trustworthy Distributed Systems with WebAssembly and TEEs**. *Proceedings of the 27th International Conference on Principles of Distributed Systems (OPODIS)*, 2023
10. **Peterson Yuhala**, Pascal Felber, Hugo Guiroux, Jean-Pierre Lozi, Alain Tchana, Valerio Schiavoni, Gaël Thomas. **SecV: Secure Code Partitioning via Multi-Language Secure Values**. *Proceedings of the 24th ACM/IFIP International Middleware Conference*, 2023
11. **Peterson Yuhala**, Michael Paper, Timothée Zerbib, Pascal Felber, Valerio Schiavoni, Alain Tchana. **SGX Switchless Calls Made Configless**. *Proceedings of the 53rd Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, 2023
12. Boris Teabe, **Peterson Yuhala**, Alain Tchana, Fabien Hermenier, Daniel Hagimont, Gilles Muller. **(No)Compromis: Paging Virtualization is Not a Fatality**. *Proceedings of the 17th ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments (VEE)*, 2021
13. **Peterson Yuhala**, Pascal Felber, Valerio Schiavoni, Alain Tchana. **Plinius: Secure and Persistent Machine Learning Model Training**. *Proceedings of the 51st Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, 2021
14. **Peterson Yuhala**, Jämes Ménétrey, Pascal Felber, Valerio Schiavoni, Alain Tchana, Gaël Thomas, Hugo Guiroux, Jean-Pierre Lozi. **Montsalvat: Intel SGX Shielding for GraalVM Native Images**. *Proceedings of the 22nd ACM/IFIP International Middleware Conference*, 2021

## INVITED TALKS

- Guest lecture at the University of British Columbia, hosted by Dr. Aastha Mehta (Oct. 2025)
- Invited talk at FAU Erlangen-Nürnberg, hosted by Prof. Dr.-Ing. Rüdiger Kapitza (July 2024)
- Guest speaker at Privacy Reunion 3, hosted by the Crypto Valley Association (June 2024)
- Speaker at the 39th ACM/SIGAPP Symposium on Applied Computing (April 2024)
- Speaker at the 24th ACM/IFIP International Middleware Conference (Dec. 2023)
- Speaker at the 53rd IEEE/IFIP International Conference on Dependable Systems and Networks (June 2023)

- Invited talk at Huawei Research Center Zürich (December 2022)
- Guest lecture at the Institute of Computer Science, University of Yaoundé I (Dec. 2022)
- Guest speaker at the Conférence Universitaire de Suisse Occidentale (Dec. 2021)
- Speaker at the 22nd ACM/IFIP International Middleware Conference (Dec. 2021)
- Speaker at the 51st IEEE/IFIP International Conference on Dependable Systems and Networks (June 2021)
- Speaker at the Conférence francophone d'informatique en Parallélisme, Architecture et Système (July 2019)

## TECHNICAL PROJECTS

### **Secure processing-in-memory**

April 2024 – March 2026

*P4 SNSF Project: Practical Privacy-Preserving Processing, Neuchâtel, Switzerland*

- Mitigating PIM data transfer overhead with inline deduplication and compression
- Exploring cryptographic approaches for securing PIM workloads

### **Securing IoT peripherals with TEEs**

Feb. 2023 – Nov. 2023

*VEDLIoT project, Neuchâtel, Switzerland*

- TCB reduction in peripheral device drivers in OP-TEE OS for Arm TrustZone

### **Multilanguage program partitioning for TEEs**

Sept. 2021 – Dec. 2022

*Collaboration with Oracle Labs Zürich*

- Using the GraalVM Truffle framework to implement generic AST nodes that encapsulate sensitive information in polyglot programs
- Building a taint analysis tool to analyze the AST and partition the program for TEEs
- [gitlab.com/Yuhala/generic-tools](https://gitlab.com/Yuhala/generic-tools)

### **Configless Intel SGX switchless calls**

Aug. 2021 – Feb. 2022

*University of Neuchâtel*

- Design of a dynamic worker thread scheduling system for switchless enclave routines
- [gitlab.com/Yuhala/zc-switchless](https://gitlab.com/Yuhala/zc-switchless)

### **Partitioning Java programs for TEEs**

July 2020 – June 2021

*Collaboration with Oracle Labs Zürich*

- Java program partitioning with annotations and bytecode transformations for TCB reduction, implemented with GraalVM CE
- [github.com/Yuhala/montsalvat](https://github.com/Yuhala/montsalvat)

### **Fault tolerance for TEE programs**

April 2019 – June 2020

*University of Neuchâtel*

- Leveraging persistent memory (PM) to provide efficient fault-tolerance guarantees in TEE programs; use case: secure machine learning
- [github.com/Yuhala/plinius](https://github.com/Yuhala/plinius)

### **Memory address translation in virtualization**

March 2018 – Sept. 2018

*IRIT, Toulouse, France*

- Modifying the Xen hypervisor to provide contiguous memory to paravirtual guest VMs: [github.com/Yuhala/xen](https://github.com/Yuhala/xen)
- Building a VM placement simulator: [github.com/Yuhala/placement-simulator](https://github.com/Yuhala/placement-simulator)

### **SIMbox fraud detection**

Sept. 2017 – Jan. 2018

*National Advanced School of Engineering, Yaoundé, Cameroon*

- Tool for SIMbox fraud detection based on the ELK stack: [github.com/Yuhala/elk-fraud-detection](https://github.com/Yuhala/elk-fraud-detection)

### **Embedded electronics**

July 2016 – Sept. 2016

*National Advanced School of Engineering, Yaoundé, Cameroon*

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|            | <ul style="list-style-type: none"> <li>• Design and implementation of embedded software for home-automation systems on Arduino, MSP-430, and ESP32</li> <li>• <a href="https://github.com/Yuhala/embedded-design">github.com/Yuhala/embedded-design</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |
| TEACHING   | <b>Teaching Assistant, Faculty of Science</b><br><i>University of Neuchâtel, Switzerland</i> <ul style="list-style-type: none"> <li>• Discrete Mathematics for Computer Science</li> <li>• Networking and Web Technologies</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | April 2019 – Feb. 2026 |
| SERVICE    | <b>Program committees</b> <ul style="list-style-type: none"> <li>• <a href="#">Middleware 2026</a></li> <li>• <a href="#">Workshop on Reliable Large-scale Data Management 2025</a></li> <li>• <a href="#">DSN Doctoral Forum 2025</a></li> </ul> <b>Artifact evaluation committees</b> <ul style="list-style-type: none"> <li>• <a href="#">International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS) 2024</a></li> <li>• <a href="#">USENIX Conference on Operating Systems Design and Implementation (OSDI) 2021</a></li> <li>• <a href="#">EuroSys 2021</a></li> </ul> <b>Reviewing</b> <ul style="list-style-type: none"> <li>• Sub-reviewer, IEEE International Conference on Cloud Engineering (IC2E) 2021</li> </ul> <b>Volunteering</b> <ul style="list-style-type: none"> <li>• Organizing a STEM bootcamp: <a href="https://scienceprojectscmr.github.io">scienceprojectscmr.github.io</a></li> <li>• Scientific articles for the LexTech Institute blog: <a href="https://lextechinstitute.ch/blog">lextechinstitute.ch/blog</a></li> <li>• <a href="#">University media presence: secure data processing in the cloud</a></li> <li>• Student volunteer, OPODIS 2019</li> <li>• Student volunteer, COMPAS 2018</li> </ul> |                        |
| SKILLS     | <i>Programming languages:</i> C/C++, Java, Python<br><i>Systems security:</i> Intel SGX, Intel TDX, Arm TrustZone, OP-TEE, AMD SEV<br><i>Web development:</i> HTML5/CSS, JavaScript, SQL, Laravel/PHP, Flask<br><i>Embedded/IoT systems:</i> Arduino, Raspberry Pi, ESP32, Microcontrollers<br><i>Miscellaneous:</i> Linux, Git, Shell (Bash), Docker, LaTeX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                        |
| REFERENCES | <b>Aastha Mehta</b><br><i>Assistant Professor, University of British Columbia, Vancouver, Canada</i><br><a href="mailto:aasthakm@cs.ubc.ca">aasthakm@cs.ubc.ca</a><br><br><b>Pascal Felber</b><br><i>Professor, University of Neuchâtel, Switzerland</i><br><a href="mailto:pascal.felber@unine.ch">pascal.felber@unine.ch</a><br><br><b>Alain Tchana</b><br><i>Professor, Grenoble INP – Ensimag, France</i><br><a href="mailto:alain.tchana@grenoble-inp.fr">alain.tchana@grenoble-inp.fr</a><br><br><b>Lydia Chen</b><br><i>Professor, University of Neuchâtel, Switzerland</i><br><a href="mailto:lydia.chen@unine.ch">lydia.chen@unine.ch</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |