Adrien **Ghosn**

PhD student in Computer Science

Place du Grand Saint Jean 2, 1003 Lausanne

(+33) 6 13 17 61 55 | ghosn.adrien@gmail.com | https://people.epfl.ch/adrien.ghosn | aghosn | aghosn

Education

Ecole Polytechnique Federale de Lausanne(EPFL) — *Lausanne, Switzerland*

Computer Science Engineering — *Sep. 2010 - PRESENT*

- 2016 – Present: PhD in Datacenter System Laboratory, supervised by Prof. Edouard Bugnion
- 2013 – 2016: Master Degree, Foundations of Software specialization (avg 5.75/6)
- 2010 – 2013: Bachelor Degree

Northeastern University(NEU) — *Boston, U.S.A.*

Master Thesis — *Sep. 2015 - Mar. 2016*

- Supervised by Prof. Jan Vitek in the Programming Languages Laboratory

Carnegie Mellon University(CMU) — *Pittsburgh, U.S.A.*

Exchange Year, Bachelor Degree in Computer Science — *Aug. 2012 - Jul. 2013*

- Dean's list School of Computer Science for QPA > 3.75/4

PhD Internships

Summer Internship — *Kirkland, USA*

Google Asylo team - Matt Gingell — *June - August 2019*

- Asylo team, Trusted Execution environments, SGX
- Explored potential designs to support higher-level programming languages in SGX enclaves
- Delivered a prototype that allowed HLPL code to run inside SGX

Skills

Programming Go, C/C++, Java, Shell scripting, asm, Python

Knowledge in Operating System design, Trusted Execution Environments (SGX), Compilers & PL design, Language runtimes & virtual machines, Virtualization, Theoretical CS, Concurrent & Distributed Algorithms, Software security

Research

Current Research Area — *Lausanne, Switzerland*

EPFL, DCSL - Prof. Edouard Bugnion, Prof. James Larus, Prof. Mathias Payer — *Aug. 2019 - Present*

- Intersection between PL, systems, and Security
- Abusing existing programming abstractions to provide efficient support for security hardware extensions
- Language and hardware-based isolation of mutually distrustful packages in applications

Enclosures: Language-based restriction of untrusted libraries (ASPLOS21) — *Lausanne, Switzerland*

EPFL, DSCL - Prof. Edouard Bugnion, Prof. James Larus, Prof. Mathias Payer — *Sep. 2019 - Oct. 2020*

- New fine-grain programming abstraction to restrict public libraries access to program resources.
- Go, Python, Intel VT-x, Intel MPK, Address-space isolation, Sandboxing, LitterBox
- **asplos link**

Secured Routines: Language-based construction of TEEs (ATC19) — *Lausanne, Switzerland*

EPFL, DSCL - Prof. Edouard Bugnion, Prof. James Larus — *Jun. 2018 - May 2019*

- Extended Go programming language to support executing goroutines inside Intel SGX.
- Intel SGX, Confidentiality, Intergrity, Go, Compilers, Code partitioning, Hardware Extensions
- **usenix link**

Light-Weight Contexts in Dune

Lausanne, Switzerland

EPFL, DSCL - Prof. Edouard Bugnion — *Sep. 2016 - Jul. 2017*

- Leveraged Dune to allow threads to switch between different views of an address space and take snapshots. Allows to protect secrets while executing untrusted library code, or to restore a pristine state after executing an RPC.
- 5x speed improvement over a linux fork.
- Intel VTX, Dune, Virtualization, Kernel module, Virtual Memory Management

Efficient Runtime Deoptimization for R(Master Thesis)

Boston, U.S.A.

Northeastern University - Prof. Jan Vitek — *Sep. 2015 - Mar. 2016*

- Assumption-based optimizer for an R JIT compiler to remove performance bottlenecks inherent to the language, while preserving semantics at runtime.
- On-stack replacement, assumption-based compiler optimizations, runtime deoptimization, R, LLVM, JIT compilers

Aperiodic-Event Support in FASA

Baden, Switzerland

ABB Corporate Research - Dr. Manuel Oriol — *Feb. 2015 - Aug. 2015*

- Fixed-priority servers, data-driven events, real-time control applications, kernel design, dynamic linking/loading & software updates, pi-calculus

Scalameta: AST Persistence & Obey: Code Health

Lausanne, Switzerland

EPFL, LAMP - Prof. Martin Odersky & Dr. Eugene Burmako — *Jan. 2014 - Feb. 2015*

- Obey: Scala-linter that accepts user-defined rules enforced at compile-time.
- AST Persistence: typed-AST based format for Scala code to resolve compiler version incompatibilities and IDE support.

Projects

Operating Systems & Design 15-410

CMU

Undergraduate — *Jan. 2013 - Jul. 2013*

- Implementation of a x86 Unix like Kernel in C and ASM. The project required to design and implement the thread library, the virtual memory, the drivers for the display, keyboard and clock, the system calls and an efficient scheduler

Tweet Aggregator

EPFL

Graduate — *Jan. 2014 - Jul. 2014*

- Big Data web application that gathers and displays real-time tweets according to user-defined keywords. The application gives a fine-grained filtering of tweets according to zoom-level and selected geographical areas. The project evolved into crossstream.ch

Compiler & Advanced Compiler

EPFL

Graduate — *Sep. 2013 - Jul. 2014*

- Design & implementation of compilers for Java & Lisp-like languages, with optimization phases including DCE-CSE, constant folding, closure hoisting, and the full implementation of a mark & sweep garbage collector.

Personnal

Languages Fluent in French & English, notions in Italian & Romanian.

Extra-curricular Teaching Assistant in: Functional Programming (2020), Introduction to Operating Systems (2019), Introduction to Java Programming (2018), Systems for Data Science (2020-2017), Introduction to C Programming (2016,2017), Concurrent Programming (2015) Student Volunteer at ECOOP (2016)