Adrien **Ghosn**

PhD student in Computer Science

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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

Research & Publications

Ongoing Research — *Lausanne, Switzerland*

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

- Web-assembly as unit of intra-address space isolation

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
- Frontend extensions to Go and Python PLs
- Backend support for hardware isolation enforcement (Intel VT-x & Intel MPK)
- Intra-address-space isolation, Sandboxing, Compiler, Linker, Runtime
- **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*

- Process virtualization with Dune
- Intra-address space isolation, limited view of process memory resources
- Protecting application secrets from untrusted libraries
- Inter-RPC isolation, process memory snapshots
- 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

- Speculative optimizer for an R JIT compiler
- Removes performance bottlenecks due to the language semantics
- Ensures correct run-time behavior.
- On-stack replacement, speculative optimizations, runtime de-optimization, R, LLVM, JIT compiler

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 for user-defined rules enforced at compile-time
- AST Persistence: typed-AST format for Scala
- Resolves compiler version incompatibilities and provides IDE macros expansion support

Projects

Operating Systems & Design 15-410

CMU

Undergraduate

Jan. 2013 - Jul. 2013

- Implementation of a x86 Unix like Kernel in C and ASM
- Design and implementation of thread library, scheduler, virtual memory, various drivers, system calls

Tweet Aggregator

EPFL

Graduate

Jan. 2014 - Jul. 2014

- Big Data web application to gather and display real-time tweets on a map, according to user-defined keywords
- Filtering and clustering tweets according to zoom-level and selected geographical areas

Compiler & Advanced Compiler

EPFL

Graduate

Sep. 2013 - Jul. 2014

- Design & implementation of compilers for JVM-based Lisp-like languages
- Mark & sweep garbage collector and optimization phases including DCE-CSE, constant folding, closure hoisting

Skills

Research in	Programming Languages, Systems, Security Programming abstractions for efficient hardware-enforced isolation Isolation of mutually distrustful software components
Programming	Go, C/C++, Java, Shell scripting, asm, Python
Knowledge in	Compilers & PL design, Language runtimes & virtual machines Operating System design, Virtualization, KVM, Intel VT-x, Intel MPK Software security, Hardware Security extensions, Trusted Execution Environments Theoretical CS, Concurrent & Distributed Algorithms

Personnal

Languages	Fluent in French & English
Teaching Assistant	Functional Programming (2020), Introduction to Operating Systems (2019) Introduction to Java Programming (2018), Systems for Data Science (2017-2020) Introduction to C Programming (2016-2017), Concurrent Programming (2015) Student Volunteer at ECOOP (2016)