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

Focus Areas
Programming Languages, Systems, Security
Isolation of mutually distrustful software components
Hardware-enforced isolation

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, protecting secrets, 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)

NORTHEASTERN UNIVERSITY - PROF. JAN VITEK

Boston, U.S.A.
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

ABB CORPORATE RESEARCH - DR. MANUEL ORIOL

Baden, Switzerland
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

EPFL, LAMP - PROF. MARTIN ODERSKY & DR. EUGENE BURMAKO

Lausanne, Switzerland
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

UNDERGRADUATE

CMU
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

GRADUATE

EPFL
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

GRADUATE

EPFL
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

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

Teaching

Semester Projects	Go Intel MPK library (Charly Castes)
	System call filtering in Go & Python enclosure support (Elsa weber)
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)

Personnal

Languages	Fluent in French & English