Abel Nieto

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I expect to complete my PhD by July 2023. I am interested in an applied scientist or formal methods engineer position in industry, in the fields of formal verification, programming language design, compilers, type systems, and static analysis. I am affiliated with Aarhus University, but live in Waterloo, Canada.

Education

January 2020 – July 2023 (in progress)	**PhD (Computer Science)**, *Aarhus University*, Denmark. Formal verification of distributed systems using separation logic. Advised by Lars Birkedal. Past projects on causal consistency and CRDTs. Current project on robust safety for authorization.
May 2017– Dec 2019	**Master of Mathematics (Computer Science)**, *University of Waterloo*, Canada. Designed and implemented "explicit nulls", an extension to Scala's type system for tracking nullability that was merged into the Scala 3 compiler. Advised by Ondřej Lhoták. Additional work on decidability of the DOT calculus, as well as blame tracking for null interop.
Sep 2009–Apr 2014	**Bachelor of Computer Science**, *University of Waterloo*, Canada. Major average: 92.53/100. Graduated with Distinction on the Dean's Honours List.

Work Experience

June–Sept 2019	**Research Intern**, *Microsoft Research*, Redmond, USA. Designed and implemented universal and existential types in the CheckedC compiler. Advised by David Tarditi.
May–Aug 2018	**Research Intern**, *MPI-SWS*, Kaiserslautern, Germany. Static analysis (abstract interpretation) and fuzzing for the Ethereum Virtual Machine.
May 2014–April 2017	**Software Engineer**, *Google*, Kitchener, Canada. Google Fiber TV and Technical Infrastructure teams. Android and backend development in Java. Distributed build systems in Go.
Sep–Dec 2013	**Software Engineer Intern**, *Facebook*, Menlo Park, USA. Implemented immutable containers (e.g. FrozenVector) for Facebook's HHVM JIT.
May–Aug 2012	**Software Engineer Intern**, *Facebook*, Menlo Park, USA. Implemented tracking of perf events (e.g. branch misses) for Facebook's HHVM JIT.
Sep–Dec 2011	**Software Engineer Intern**, *Facebook*, Palo Alto, USA. Backend and frontend development in a system for enforcing intellectual property rights.
Jan–Apr 2011	**Software Engineer Intern**, *BlackBerry*, Waterloo, Canada. Embedded development in C for an NFC driver.

Publications

Please see my Google Scholar profile.

Skills

- Coq, separation logic (expert)
- SAT and SMT solvers (familiar)
- Compiler hacking (frontend) and type systems (expert)
- Algorithms and data structures design (expert, former competitive programmer)
- Scala/Go/Java/C++/Scheme/OCaml (familiar)

Misc

Jul 2010 **Winner**, *Waterloo Local Programming Contest*.

2008 **Silver Medal (44th/300+)**, *XX International Olympiad in Informatics*, Cairo, Egypt.

2007 **Participant (187th/300+)**, *XIX International Olympiad in Informatics*, Zagreb, Croatia.