

# Mathias Vorreiter Pedersen



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## Work experience

**Senior Software Engineer, *GitHub*.** 2019 –

Working on CodeQL: a code analysis platform for securing the worlds' software.

**Android Developer, *TV 2*.** 2015

Developed a “trojan horse”-style app used by the publicly-owned Danish television channel TV 2 for a series of programmes about the dangers of giving third-party apps too many privileges.

**iOS Developer, *Apprestitute*.** 2012 – 2015

Lead developer of the iOS team.

## Education

**Research visit, *Harvard University, Boston, Massachusetts*.** 2018

Six month research visit at Gordon McKay Professor Stephen Chong's group at Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS).

**University, *Aarhus University, Aarhus*.** 2015 – 2019

Ph.D. in Computer Science

Thesis: *Enforcement of Timing-Sensitive Security Policies in Runtime Systems*

**University, *Aarhus University, Aarhus*.** 2014 – 2017

Master of Computer Science

**University, *Aarhus University, Aarhus*.** 2011 – 2014

Bachelor of Computer Science

**Gymnasium, *Vejle Tekniske Gymnasium, Vejle*.** 2008 – 2011

## Interests

Programming language design and implementation

Computer security

Semantics of programming languages

## Programming projects

Here's a highlight of some interesting programming projects I've done. The projects are sorted by the number of stars on GitHub (in descending order).

**Counter-Strike 1.6, in *JavaScript*.**

An implementation of Counter-Strike 1.6 in JavaScript. It parses the original game files and renders the game using WebGL.

### **Windows API-hooking framework, in C++.**

A framework for hooking low-level Windows API functions (i.e., hooking NtQueryDirectoryFile in explorer.exe).

### **LR(1) parsing using template metaprogramming, in C++.**

An LR(1) parser generator implemented using only template metaprogramming in C++.

### **Alpha, in Standard ML.**

A compiler for a programming language of my own design. It is a garbage collected, object-oriented language with first-class functions.

## **Volunteer work**

**Student volunteer, GOTO conference, Aarhus. 2012-2014**

**Technical volunteer, Roskilde festival. 2012**

Sprinted across the festival area and fixed ATMs when they, inevitably, broke down during the festival.

## **Academic activities**

### **Conferences**

*European Symposium on Security and Privacy (EuroS&P), Stockholm, Sweden. 2019*

*Computer Security Foundations Symposium, Hoboken, NJ. 2019*

*Symposium on Principles of Programming Languages (POPL), Lisbon, Portugal. 2019*

*38th IEEE Symposium on Security and Privacy (S&P), San Jose, CA. 2017*

*Symposium on Principles of Programming Languages (POPL), Paris, France. 2017*

Received a scholarship through the Programming Languages Mentoring Workshop (PLMW).

### **Workshops**

*Principles of Secure Compilation (PriSC), Lisbon, Portugal. 2019*

*Google PhD Student Summit on Compiler & Programming Technology, Munich, Germany. 2015-2018*

*Nordic Workshop on Programming Theory (NWPT), Aalborg, Denmark. 2016*

### **Summer schools**

*DeepSpec Summer School on Verified Systems (DSSS), Princeton, New Jersey. 2018*

*Oregon Programming Languages Summer School (OPLSS), Eugene, Oregon. 2017*

*Midlands Graduate School in the Foundations of Computing Science (MGS), Birmingham, England. 2016*

## Awards

**Student of the Year Award**, Aarhus University. **2016**  
Jointly awarded *Student of the Year* with fellow students Thor Bagge and Mikkel Brun Jakobsen for the positive influence on the learning environment and the dissemination of extra curricular knowledge.

## Grants

**Stibo Foundation's IT travel grants for PhD students**, *Stibo Systems*, 60.000 DKK. **2018**

I have received the Stibo foundation's IT travel grant for "Excellent Danish PhD students in computer science and IT."

**Graduate School of Science and Technology**, Aarhus University, 20.000 DKK. **2018**

I am a receipt of the GSST grant for "Financial support for stays abroad for PhD students enrolled at Graduate School of Science and Technology/GSST."

## Teaching

**Occasional lecturer**, *Compilers*, Aarhus. **2018-2019**

**Teaching assistant**, *Compilers*, Aarhus. **2014-2017**

**Teaching assistant**, *Programming Languages*, Aarhus. **2015**

**Organizer and lecturer**, *Spare-Time Teaching*, Aarhus. **2013 – 2017**

I taught undergrad students in several topics related to the foundations of programming language semantics. Topics include the lambda calculus, dependent type theory and programming paradigms.

## Languages

**Danish**: Native or bilingual proficiency

**English**: Full professional proficiency

## Publications

**Static Enforcement of Security in Runtime Systems.**

*In Proceedings of the 32nd IEEE Computer Security Foundations Symposium.*

**Programming with Flow-Limited Authorization: Coarser is Better.**

*In Proceedings of the 4th IEEE Symposium on European Security and Privacy.*

**From trash to treasure: timing-sensitive garbage collection.**

*In Proceedings of the 38th IEEE Symposium on Security and Privacy.*