Fu Yong Quah

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Hacking: fyquah.me/
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mov %fyquah, 0x5F
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I am a software engineer, specialising in *compiler engineering* and *FPGA design*. I have worked on various-scaled projects with strong algorithmic, concurrency and parallelism requirements.

Education

Imperial College London
Master of Engineering (MEng)
Electronic and Information Engineering
Thesis: Inlining ML with ML
First Class Honours
Best Individual Project in EIE

Skills

Programming: *OCaml, C++, Java, Python, Shell Scripting*
Experienced working with large code-bases for asynchronous applications.

Compiler Hacking:
Built my own C-compiler from scratch, contributed to the OCaml compiler and worked on a research project on statistical compiler optimisation.

High Performance Computing:
OpenCL, IntelTBB, FPGA-acceleration
Experienced in design space exploration and mathematically-driven heuristics to accelerate performance-sensitive applications.

Academic Reference

David Thomas
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Senior Lecturer
Department of Electrical and Electronic Engineering
Imperial College London

Professional Experience

Jane Street Capital — London, United Kingdom
Software Developer Intern — *April 2017 - September 2017*

- Worked with functional programming in OCaml
- Worked on data synchronisation across global trading systems, real-time large-scale reactive calculations and compiler engineering.
- **Flambda** - *a high-level optimising compilation pass in OCaml*
  - Improved the compilation pass' performance, emphasising on the straightforward compilation mode (ie: `-Oclassic`, similar to `-O0`)
  - Reduced Flambda's compilation time by up to 25% and IR sizes by up to 50% using algorithmic elimination of unreachable functions
  - Patch was released in OCaml 4.07

Google — Mountain View, CA
Software Engineer Intern — *Jun 2016 - September 2016*

- Wrote python to improve python tooling within the company
- **Pytype** - *an open source python type checker and inference tool*
  - Integrated pytype with bazel and tricorder, google's large-scale compilation pipeline and program analysis tools
- **CLIF** - *a tool that wraps C++ for high level languages like python*
  - Wrote a utility to automatically generate python type annotation (in the form of .pyi files) for CLIF descriptors
  - Integrated the tool with the internal compilation pipeline and pytype, providing automatic type-checking for internal projects that uses CLIF and pytype.

Netcraft Ltd — Bath, United Kingdom
Internet Service Developer — *June 2015 - August 2015*

- Worked on web development using Perl, SQL PHP and javascript to improve data collection in a web-hosting company survey.
- Hired and trained part-time classifiers to label data in the survey

Projects

MEng thesis - Inlining ML with ML *(2017 - 2018)* -
Research-project that investigates machine learning techniques to improve static function inlining in the Flambda pass of OCaml, delivering a median speedup of 2% without significant human insight.

Convolutional Neural Network FPGA Acceleration *(2017)* -
https://github.com/fyquah95/fpgaconvnetmaxeler
Open source end-to-end tool (from mathematically-guided design space exploration and compilation to a FPGA bitstream) for accelerating feature extraction stage in CNNs across a pipeline of Maxeler FPGAs.

Self-Hosting C-to-MIPS Compiler *(2016)*
Self-hosting C Compiler supporting a turing complete subset of the C89 grammar (including goto!). Written in C89 with flex and bison.

International Olympiad in Informatics *(2014)*

Hacks + Interesting Things

Deriving OCaml runtime from x86 https://goo.gl/R51ZyK
Bot playing solitaire on Messenger https://youtu.be/xFNd-foQYrs
Bot playing basketball on Messenger https://goo.gl/CSmG5S
Die Hard 3 - Jugs Problem https://goo.gl/eV1Wgm
Memory bus = antenna? https://github.com/fyquah95/ramear