

# Fu Yong Quah

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Hacking: [fyquah.me/](https://fyquah.me/)  
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## EDUCATION

### Imperial College London

Master of Engineering (MEng)  
Electronic and Information Engineering  
Thesis: *Inlining ML with ML*  
Expected First Class Honours

## SKILLS

**Programming:** OCaml, F#, C++, C, Java, Python, Shell Scripting, git  
Familiar with object-oriented and functional paradigms, various testing methodologies and working in teams. Experienced working with large code-bases for asynchronous applications.

### Compiler Hacking:

Built my own C-compiler from scratch, contributed to the official OCaml compiler and working on a research project on statistical compiler optimisation.

### Computer Architecture:

Reads machine code. Understands modern microprocessors cache hierarchies, memory models, execution pipelines.

### High Performance Computing:

OpenCL, IntelTBB, FPGA-acceleration  
Experienced in design space exploration and scheduling heuristic to accelerate applications.

### Algorithms, Complexity:

Ranked in the top 6 twice in the UK ACM-Subregional Programming Contest. Represented Malaysia to the International Olympiad of Informatics in 2014.

### Machine Learning: Tensorflow, Pytorch

Implemented ML algorithms and understands them thoroughly, with an emphasis in Reinforcement Learning.

## PROFESSIONAL EXPERIENCE

### Jane Street Capital Europe

Software Developer Intern

London, United Kingdom

April 2017 - September 2017

- Worked with functional programming OCaml in an industry setting
- Worked on data synchronisation across multiple trading systems throughout the globe, performing real-time large-scale low-latency reactive calculations and compiler optimisation.
- Flambda** - a compilation pass in the OCaml Compiler that carries out high-level compilation passes and optimisation.
  - Improved the compilation pass' performance, with emphasis on straightforward compilation strategies (ie: -Oclassic, similar to -OO in C++ compilers)
  - Reduced Flambda's compilation time by up to 25% and IR sizes by up to 50%
  - Patch is scheduled to be released in OCaml 4.07
  - Read the x86.64 compiler output to better understand the types of compiler optimisations performed

### Google

Software Engineer Intern

Mountain View, CA

Jun 2016 - September 2016

- Worked primarily in python to improve python tooling within the company
- Pytype** - a opensource PEP484-compliant type checker and inference tool
  - Integrated pytype with bazel and tricorder, google's large-scale compilation pipeline and program analysis tools
  - Discovered several subtle bugs in several internal tools, including borg, google's cluster management tool, and pytype itself
- CLIF** - a wrapper generator to wrap C++ code for python and other high level language.
  - Wrote a tool 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

Internet Service Developer

Bath, United Kingdom

June 2015 - August 2015

- Worked primarily with Perl, SQL and PHP with web development tools to improve data collection in a hosting-company survey
- Hired and trained part-time classifiers to label data in the survey

## PROJECTS

### MEMeng thesis - Inlining ML with ML (2017 - 2018) -

Research-project that investigates machine learning techniques to improve high-level function inlining in both profile-guided and static settings.

### Convolutional Neural Network (CNN) FPGA Acceleration

(2017) - optimise a CNN pipeline with design space exploration across multiple FPGAs with dataflow programming using the maxeler compiler.

**Self-Hosting C Compiler (2016)** - Turing complete subset (including goto) self-hosting C Compiler, including scratch using from lexing (flex), parsing (bison) C89 grammar to MIPS assembly generation.

## HACKS + INTERESTING THINGS

**Deriving OCaml runtime from x86** <https://goo.gl/R51ZyK>

**Bot playing solitaire** <https://youtu.be/xFNd-foQYrs>

**Bot playing messenger basketball** <https://goo.gl/CSmG5S>

**Memory bus = antenna?** <https://github.com/fyquah95/ramear>

**Die Hard 3 - Jugs Problem** <https://goo.gl/eV1Wgm>