

# Yusuke Suzuki

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**Research Interests** System software, Web browsers, JIT compilers, Operating systems, Virtual machine technology, Distributed/Parallel systems and Graphic Processing Units (GPUs)

**Education** **Ph.D. student in Information and Computer Science** *Apr. 2015 – (expected Sept. 2018)*  
Supervisor: Prof. Kenji Kono Keio University

- Integrating GPUs into system software abstractions and coordinating GPUs and the other devices.

**M.E. in Information and Computer Science** *Apr. 2013 – Mar. 2015*  
Supervisor: Prof. Kenji Kono Keio University  
Master Thesis: *Design and Implementation of GPU Virtualization at the Hypervisor*

- Designed open architecture of GPU virtualization using Xen. Built a prototype of fully virtualized GPUs and multiplexed virtualized GPUs.

**B.E. in Information and Computer Science** *Mar. 2013*  
Supervisor: Prof. Kenji Kono Keio University  
Bachelor Thesis: *GPU Virtualization for General-purpose computing*

- Investigated GPU internals and interactions between GPUs and OS.

**Awards and Honors** **Yamashita SIG Research Award** *Mar. 2015*  
Information Processing Society of Japan

**Best Student Presentation Award** *Dec. 2013*  
SIGOS, Information Processing Society of Japan

**Yamauchi Prize for Encouragement** *Jan. 2013*  
Information Processing Society of Japan

**Nakanishi Award** *Mar. 2013*  
Keio University

**Teaching Experience** **Teaching Assistant** *Apr. – Sept. 2013 – 2018*  
PROGRAMMING 1, COMPUTER SCIENCE Keio University

- Supported for teaching C programming.
- Helped students with programming.
- Graded their reports.

**Work Experience** **Research Fellowships of the Japan Society for the Promotion of Science for Young Scientists; DC1** *Apr. 2015 – Mar. 2018*  
Japan Society for the Promotion of Science

- CEO** *Dec. 2016 – Present*  
Secure Engine Inc.
- Research specific venture at Keio University, the University of Tokyo, and TUAT. Working on research topics which are related to GPUs in the cloud.
- Research Assistant** *Apr. 2018 – Present*  
Keio University, JST CREST
- Researcher. Working on research topics which are related to GPUs in the cloud.
- Software Engineering Intern** *Aug. 2016 – Nov. 2016*  
Apple Inc.
- At WebKit architecture team, accelerated DOM operations by handling them in JavaScriptCore JIT tiers.
  - Implemented and shipped ES6 Modules in the production browser, then Safari becomes the first browser shipping ES6 modules by default.
  - Optimized ES6 generators which become the basis of critical feature of ES7, async and await. Details are described in the WebKit Blog <https://webkit.org/blog/7536/>.
- Software Engineering Intern** *July 2015 – Sept. 2015*  
Apple Inc.
- At WebKit architecture team, developed ECMAScript 6th Modules including loading and execution semantics.
  - Enhanced the other features of ES6 like the Reflect module.
- Software Engineering Intern** *Aug. 2013 – Sept. 2013*  
Google Japan Inc.
- At Google Chrome team, developed ECMAScript 6th Promises in the browser side.
  - Optimized XMLHttpRequest Blob transferring.
  - Created 30~ patches and became a Chromium committer.
- Cybozu Labs Youth Fellowships** *Apr. 2011 – Mar. 2012*  
Cybozu Labs Inc.
- Worked on implementing ECMAScript engine which conforms the spec tests completely.
  - Figured out and reported spec issues.
- Part-time Programmer** *Oct. 2010 - July 2013*  
Cloudstudy Inc.
- Developed iOS application by using Objective-C. And implemented JavaScript modules used on their web service.

## Activities

### WebKit

#### Reviewer

- Contributed to WebKit CSS JIT, that just-in-time compiles CSS selector to machine code to make matching against elements faster. Mainly focused on more intelligent backtracking.

- Implemented bunch of ES6 features like generators, Symbols etc. into JavaScript-Core.
- Very active WebKit reviewer and maintainer of Linux WebKit JavaScriptCore.

## Chromium

### Committer

- Worked on Google Chrome and Blink as software engineering intern as [yusukesuzuki@chromium.org](mailto:yusukesuzuki@chromium.org).
- Improved Blob data handling in XMLHttpRequest.
- Landed the initial implementation of ES6 Promises in the Blink side.

## iv/iv5

Building ECMAScript engine from scratch <https://github.com/Constellation/iv>

- Built the new ECMAScript engine that conforms ECMA262 5.1th spec.
- Found and reported many bugs in the spec and Test262 conformance suite.
- Implemented baseline JIT compiler for x86\_64 environment including Inline Caching (IC).

## Escodegen, Esmangle, Estraverse etc.

ECMAScript language tools <https://github.com/estools/escodegen>

- Built an infrastructure of ECMAScript tools using Mozilla JavaScript AST.

## Computer Skills

Languages: ECMAScript, Python, CSS Selectors, C, C++, x86, x86\_64 assembly language

Platforms: Linux, OSX

## Blog Posts

Barati, S., **Suzuki, Y.**, Pizlo, F. JSC loves ES6. *WebKit blog*, <https://webkit.org/blog/7536/>, June 2017.

## Invited Talk

**Suzuki, Y.** Talk about "GLoop: An Event-driven Runtime for Consolidating GPGPU Applications". In *29th Computer System Symposium (ComSys '17)*, Dec. 2017.

**Suzuki, Y.** Response to "Full Virtualization for GPUs Reconsidered". In *14th Annual Workshop on Duplicating, Deconstructing and Debunking (WDDD '17)*, <https://constellation.github.io/slides/response.pdf>, June 2017.

## Publications

### Refereed Papers

**Suzuki, Y.**, Yamada, H., Kato, S., and Kono, K. CPUs as Co-processors of GPUs: Running GPGPU Applications at the Full Speed with PullKernels. In *the 8th Workshop on Systems for Multi-core and Heterogeneous Architectures (SFMA '18)*, April 2018, to appear.

**Suzuki, Y.**, Yamada, H., Kato, S., and Kono, K. GLoop: An Event-driven Runtime for Consolidating GPGPU Applications. In *Proceedings of the 8th ACM Symposium on Cloud Computing (SoCC '17)*, Sept. 2017.

**Suzuki, Y.**, Yamada, H., Kato, S., and Kono, K. Towards Multi-tenant GPGPU: Event-driven Programming Model for System-wide Scheduling on Shared GPUs. In *the 2016 Workshop on Multicore and Rack-scale Systems (MaRS '16)*, April 2016.

**Suzuki, Y.**, Kato, S., Yamada, H., and Kono, K. GPUvm: Why Not Virtualizing GPUs at the Hypervisor?. In *Proceedings of the 2014 USENIX Annual Technical Conference (USENIX ATC '14)*, pp. 109–120, June 2014.

**Refereed Journal  
Papers**

**Suzuki, Y.**, Kato, S., Yamada, H., and Kono, K. GPUvm: GPU Virtualization at the Hypervisor. *IEEE Transactions on Computers*, vol. 65, no. 9, pp. 2752–2766, Sept. 2016.

**Non-Refereed  
Papers**

**Suzuki, Y.**, Kato, S., Yamada, H., and Kono, K. GPU の完全仮想化. Summer United Workshops on Parallel, Distributed and Cooperative Processing (SWoPP '13), pp. 195–202, July 2013.

**Suzuki, Y.** Escodegen and Esmangle: Using Mozilla JavaScript AST as an IR. Industry Track of Aspect-Oriented Software Development (AOSD '13), Mar. 2013.

**Non-Refereed  
Posters**

**Suzuki, Y.**, Kato, S., Yamada, H., and Kono, K. Design and Implementation of GPU Virtualization at the Hypervisor. JSSST Dependable System Workshop (DSW '14), Mar. 2014.

**Suzuki, Y.**, Kato, S., Yamada, H., and Kono, K. GPUvm: ハイパーバイザによる GPU の完全仮想化手法. JSSST Dependable System Workshop (DSW '13), Dec. 2013.

**Suzuki, Y.** Building modern JavaScript Engine. 2012 IPSJ Programming Symposium, Jan. 2012.

**Books**

Ryoma S., **Suzuki, Y.**, Takada K. 正規表現技術入門 最新エンジン実装と理論的背景. 技術評論社, Apr. 2015.

*Last updated April 20, 2018.*