Yusuke Suzuki

yusukesuzuki@slowstart.org
yusuke.suzuki@sslab.ics.keio.ac.jp
https://constellation.slowstart.org/

Research Interests

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

Education

Ph.D. of Engineering in Information and Computer Science *Apr. 2015 – Sept. 2018*
Supervisor: Prof. Kenji Kono Keio University
Ph.D. Thesis: *Making GPUs First-Class Citizen Computing Resources in Multi-Tenant Cloud Environments*

- Scheduled GPGPU applications on shared GPUs in the cloud.

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

Software Engineer *Jan. 2019 – present*
Apple Inc.

- Working on WebKit JavaScriptCore, JavaScript runtime including JIT compiler, used in Safari Web browser.

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 – Oct. 2018*
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 – Sept. 2018*
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 backtrackig.
- Implemented bunch of ES6 features like generators, Symbols etc. into JavaScriptCore.
- Very active WebKit reviewer and maintainer of WebKit JavaScriptCore.

Chromium
Committer

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

iv/lv5
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++, ARM64, x86, x86_64 assembly language
Platforms: Linux, OSX

Blog Posts

Baradlay, A., Koivisto, A., Woodrow, M., Angle, P., Niwa, R., Roriz, V., Hsieh, W., **Suzuki, Y**. Optimizing WebKit & Safari for Speedometer 3.0. *WebKit blog*, `https://webkit.org/blog/15249/optimizing-webkit-safari-for-speedometer-3-0/`, April 2024.

Suzuki, Y. Speedometer 2.1. *WebKit blog*, `https://webkit.org/blog/13083/speedometer-2-1/`, August 2022.

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.slowstart.org/slides/response.pdf`, June 2017.

Publications

Refereed Papers

Kubota, T., **Suzuki, Y.**, and Kono, K. To unify or not to unify: a case study on unified builds (in WebKit). In *Proceedings of the 28th International Conference on Compiler Construction (CC '19)*, pp. 42–52, Feb. 2019.

Yuhara, S., **Suzuki, Y.**, and Kono, K. An Application Framework for Migrating GPGPU Cloud Applications. In *Proceedings of the 10th IEEE International Conference on Cloud Computing Technology and Science (CloudCom '18)*, pp. 62–66, Dec. 2018.

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)*, Apr. 2018.

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)*, pp. 80–93, 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)*, Apr. 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., Yamada, H., Kato, S., and Kono, K. Cooperative GPGPU Scheduling for Consolidating Server Workloads. *IEICE Transactions on Information and Systems*, vol. E101.D, no. 12, pp. 3019–3037, Dec. 2018.

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 November 24, 2024.