Kevin Boos

Systems/Mobile Researcher

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Current Work (since 2017): Project Lead/Creator of Theseus, an OS written from scratch in Rust. Rethinks state management and realizes safe, intralingual resource management for availability/evolvability.

Education

2016 – 2020

Ph.D. Computer Engineering, *Rice University*.
Advisor: Dr. Lin Zhong, *Rice Efficient Computing Group*
Dissertation: Theseus: Rethinking Operating Systems Structure and State Management

2012 – 2016

M.S. Computer Engineering, *Rice University*.
Thesis: *Immersive VR on Weak Mobile Devices via Rendering Memoization*

2007 – 2011

B.S. Computer Engineering, *The University of Texas at Austin*.
GPA: 3.91/4.00 Minor: Mandarin Chinese

Experience

2020

Research Engineer, *Rice University (and Yale University)*.
- Continuing Theseus OS development to support existing applications (std lib, POSIX).
- Facilitating ongoing research atop Theseus: fault tolerance, baseband processing, etc.

2020

Research Intern, *Microsoft Research*.
- Scalable, fault-tolerant Cloud 5G RAN and baseband processing in software.
- Mentors: Sanjeev Mehrotra, Anuj Kalia

2015

Research Intern, *Microsoft Research*.
- Immersive Virtual Reality for weak mobile devices.
- Mentors: David Chu, Eduardo Cuervo

2014

Advanced Technology Intern, *ARRIS (formerly Motorola Mobility)*.
- Display sharing synchronization framework for multi-screen distributed systems.
- Mentors: Venu Vasudevan, Jehan Wickramasuriya

2012

Ph.D. Research Intern, *Nokia Research Center*.
- Novel I/O virtualization schemes for Linux kernel block devices.

2011

Software Developer, *Emerson Process Management, I/O Services*.
- Designed communication protocol to collect data from I/O devices for process control.
- Created Windows Forms app (C#) to log I/O data and generate graphical displays.

2009

Technical R&D Intern, *Texas Instruments DLP*.
- Developed analog circuit to power digital micromirror devices (DMD) used in pico-projectors.
- Programmed Perl test routines, lab-tested DMD functionality using probes/parametric analyzers.

Publications

OSDI'20

Kevin Boos, N. Liyanage, R. Ijaz, and L. Zhong. "Theseus: Rethinking OS Structure and State Management." *in Proc. USENIX OSDI 2020*.

PLOS'17

Kevin Boos and L. Zhong. "Theseus: A State Spill-free Operating System." *in Proc. ACM PLOS 2017*.

EuroSys'17 — **Kevin Boos**, E. Del Vecchio, and L. Zhong. "A Characterization of State Spill in Modern Operating Systems." *In Proc. ACM EuroSys 2017*.

MobiSys'16 — **Kevin Boos**, E. Cuervo, and D. Chu. "FlashBack: Immersive Virtual Reality on Mobile Devices with Rendering Memoization." *In Proc. ACM MobiSys 2016*.

APSys'15 — **Kevin Boos**, A. Amiri Sani, and L. Zhong. "Eliminating State Entanglement with Checkpoint-based Virtualization of Mobile OS Services." *In Proc. ACM APSys 2015*.

MobiSys'14 — A. Amiri Sani, **Kevin Boos**, M.H. Yun, and L. Zhong. "Rio: A System Solution for Sharing I/O Between Mobile Systems." *In Proc. ACM MobiSys 2014*, ***Best Paper Award***.

ASPLOS'14 — A. Amiri Sani, **Kevin Boos**, S. Qin, and L. Zhong. "I/O Paravirtualization at the Device File Boundary." *In Proc. ACM ASPLOS 2014*.

ICSE'12 — **Kevin Boos**, C. Fok, C. Julien, M. Kim. "BRACE: An Assertion Framework for Debugging Cyber-Physical Systems." *In Proc. ICSE 2012*.

Knowledge & Skills

Languages
- Rust
- C
- C++
- Java
- Shell, Python

Environments/Platforms
- OS development, systems hacking
- x86 architecture
- Linux kernel
- Static analysis (Clang/LLVM, Soot)
- Android frameworks

Tools
- LaTeX
- Git
- Vim

Service

2018 — App Chair, *HotMobile 2018*.

2017 — Co-Chair, *MobiSys 2017 PhD Forum*.

2017 — TPC Member, *ACM S3 2017*.

2016 — TPC Member, *MobiSys 2016 PhD Forum*.

References

Advisor — **Lin Zhong, Ph.D.**, `lin.zhong@yale.edu`.
Professor, Yale University CS Department

Mentor — **Eduardo Cuervo, Ph.D.**, `eacuervo@gmail.com`.
Software Engineer, Facebook/Oculus VR

Additional references available on request.