Joonwon Choi

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Research Interests

- Mechanized proof for the correctness of hardware implementation. Take a look at the <u>Kami</u> project page for details.

- Formal specification of <u>RISC-V</u> and verification of realistic processors.

- High-level language for coherent systems, for easy design and automated proof.

Current Position

PhD Candidate, MIT CSAIL	Sep 2014 – Present
Advisors: Adam Chlipala and Arvind	

Education

MIT CSAIL	Sep 2014 – Jun 2016
Master of Science in Electrical Engineering and Computer Science	

Seoul National University	Mar 2006 – Feb 2013
Bachelor of Science in Computer Science and Engineering	
Double major in Mathematical Sciences	
graduated with honors (summa cum laude)	

Publications

[1] An Inlining Approach to Formal Hardware Semantics. M.S. Thesis in Electrical Engineering and Computer Science. Massachusetts Institute of Technology. [pdf]
Thesis Supervisor: Arvind

Posters

[1] Towards Scalable Verified Validation of Static Analyzers. Jeehoon Kang, Sungkeun Cho, Joonwon Choi, and Chung-Kil Hur. APLAS'14.

[2] Extensible Verified Validation for LLVM Optimizations. Sungkeun Cho, Joonwon Choi, Jeehoon Kang, Chung-Kil Hur, and Kwangkeun Yi. APLAS'14.

Current Research Projects

Kami: A Coq framework to support implementing and verifying hardware components

- Kami is a Coq framework to support implementing, specifying, verifying, and compiling Bluespec-style hardware components. The core of the approach is modular proofs of hardware components. We aim for specifications and proofs that mirror the modular decomposition of a large hardware system into simpler parts. We also intend to support techniques for machine-checked correctness proofs of key synthesis algorithms that translate high-level hardware designs into low-level circuit descriptions.

Honors & Awards

Kwanjeong Educational Fellowship	Sep 2014 – Current
MIT Emerson Scholarship for Private Music Study	Sep 2014 – Current
Top Honor (summa cum laude) Certification	Feb 2013
Seoul National University	

Teaching Experience

MIT 6.887: Formal Reasoning About Programs	Spring 2017
Teaching Assistant	
SNU 4190.310: Programming Languages	Fall 2013
Teaching Assistent	

Working Experience

Microsoft Research Cambridge, United Kingdom	Mar 2013 – Apr 2013
Visiting Researcher	
Google, Korea	Jan 2009 – Apr 2009
Software Engineering Intern(SWE Intern)	