

# Joonwon Choi

Formal Verification Tech Lead at Apple  
One Apple Park Way, Cupertino, CA 95014  
+1-339-225-5940 | joonwonc@alum.mit.edu | <http://joonwon.net/c>

## Current Position

---

<b>Formal Verification Tech Lead, Apple</b>	03/15/2021 – Present
---	----------------------

I have worked on formally verifying memory subsystems and fabrics in Apple silicon. Reasoning about these components is challenging due to the numerous optimizations required to enhance system performance. My focus has been on devising methodologies to scale model checking, enabling formal reasoning at the system level, particularly for ensuring the liveness of the system.

## Education

---

<b>Massachusetts Institute of Technology</b> Doctor of Philosophy in Electrical Engineering and Computer Science - Graduate Cumulative GPA: 5.0 (on a 5.0 scale)	09/01/2016 – 02/17/2021
<b>Massachusetts Institute of Technology</b> Master of Science in Electrical Engineering and Computer Science - Graduate Cumulative GPA: 5.0 (on a 5.0 scale)	09/01/2014 – 06/03/2016
<b>Seoul National University</b> Bachelor of Science in Computer Science and Engineering Double major in Mathematical Sciences - Graduated with honors ( <i>summa cum laude</i> )	03/01/2006 – 02/26/2013

## Selected Publications

- 
- [1] **Revamping Verilog Semantics for Foundational Verification.**  
*submitted.*
  - [2] **Hemiola: A DSL and Verification Tools to Guide Design and Proof of Hierarchical Cache-Coherence Protocols.**  
*Joonwon Choi, Adam Chlipala, Arvind.*  
**CAV'22** (*regular paper, Proceedings of the International Conference on Computer-Aided Verification*).
  - [3] **Structural Design and Proof of Hierarchical Cache-Coherence Protocols.**  
*Joonwon Choi*  
**PhD Thesis** in Electrical Engineering and Computer Science, Massachusetts Institute of Technology.
  - [4] **Integration Verification Across Software and Hardware for a Simple Embedded System.**  
*Andres Erbsen, Samuel Gruetter, Joonwon Choi, Clark Wood, Adam Chlipala.*  
**PLDI'21** (*Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation*).
  - [5] **EverCrypt: A Fast, Verified, Cross-Platform Cryptographic Provider.**  
*Jonathan Protzenko, Bryan Parno, Aymeric Fromherz, Chris Hawblitzel, Marina Polubelova, Karthikeyan Bhargavan, Benjamin Beurdouche, Joonwon Choi, Antoine Delignat-Lavaud, Cédric Fournet, Natalia Kulatova, Tahina Ramananandro, Aseem Rastogi, Nikhil Swamy, Christoph M. Wintersteiger, and Santiago Zanella-Beguelin.*  
**SP'20** (*IEEE Symposium on Security and Privacy*).
  - [6] **Crellvm: Verified Credible Compilation for LLVM.**  
*Jecheon Kang, Yoonseung Kim, Youngju Song, Juneyoung Lee, Sanghoon Park, Mark Dongyeon Shin,*

Yonghyun Kim, Sungkeun Cho, Joonwon Choi, Chung-Kil Hur, and Kwangkeun Yi.  
**PLDI'18** (*Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation*).

- [7] **Kami: A Platform for High-Level Parametric Hardware Specification and its Modular Verification.**  
Joonwon Choi, Muralidaran Vijayaraghavan, Benjamin Sherman, Adam Chlipala, Arvind.  
**ICFP'17** (*Proceedings of the ACM SIGPLAN International Conference on Functional Programming*).

## Working Experience

---

<b>Apple, United States</b>	03/15/2021 – Current
<i>Formal Verification Tech Lead</i>	<i>Oct 2024 – Current</i>
<i>Senior Formal Verification Engineer</i>	<i>Oct 2023 – Sep 2024</i>
<i>Formal Verification Engineer</i>	<i>Mar 2021 – Sep 2023</i>
<b>Microsoft Research Cambridge, United Kingdom</b>	07/02/2018 – 09/21/2018
<i>Research Intern</i>	
<b>allm Games, Korea</b>	04/13/2009 – 09/12/2011
<i>Software Engineer (Skilled Industry Personnel as alternative military service)</i>	
<b>Google, Korea</b>	01/05/2009 – 04/03/2009
<i>Software Engineering Intern (SWE Intern)</i>	

## Teaching Experience

---

<b>MIT 6.887: Formal Reasoning About Programs</b>	Spring 2017
<i>Teaching Assistant</i>	
<b>SNU 4190.310: Programming Languages</b>	Fall 2013
<i>Teaching Assistant</i>	

## Academic Services

---

**Program Committee:** VSTTE 2024, PLDI 2024, CAV 2020 AE

## Honors & Awards

---

<b>Kwanjeong Educational Fellowship</b>	Sep 2014 – May 2019
<b>MIT Emerson Scholarship for Private Music Study</b>	Sep 2014 – May 2018
<b>Top Honor (<i>summa cum laude</i>) Certification</b>	Feb 2013
<i>Seoul National University</i>	
<b>Presidential Science Scholarship</b>	Mar 2006 – Feb 2013

Last updated: November 17, 2024