

HAOXIAN CHEN

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EDUCATION

University of Pennsylvania Ph.D., Computer Science Advisor: Prof. Boon Thau Loo	January 2018 - May 2023 Philadelphia, USA
Tsinghua University Bachelor of Electronic Engineering Advisor: Prof. Jun Bi	August 2012 - July 2016 Beijing, China

RESEARCH INTERESTS

I am interested in improving software verification efficiency by designing high-level domain-specific languages, with automatic verification and program synthesis support. My research spans many topics: programming languages, software engineering, domain-specific languages, program verification, program synthesis, and network protocols.

PROFESSIONAL EXPERIENCE

ShanghaiTech University <i>Assistant Professor</i>	August 2023 - Present <i>Shanghai, China</i>
· I led the Declarative Systems Lab, where we aim to transform system implementation and analysis via declarative programming. We study research problems involving program synthesis, rule mining, domain-specific language design in different system domains.	
Microsoft Research <i>Research Intern</i>	June 2020 - August 2020 <i>Redmond, USA</i>
· I worked with Behnaz Arzani and Kevin Hsieh, on AutoML for networking tasks. We introduced domain specific feedback solutions for data augmentation.	
Comcast <i>Data Analytics Intern</i>	June 2019 - August 2019 <i>Philadelphia, USA</i>
· I worked with Chuchu Wu, Patrick Carretas, and Yiu Lee, on analyzing and clustering wide-area network alarms across multiple layers.	
Carnegie Mellon University <i>Research Assistant</i>	August 2016 - December 2017 <i>Pittsburgh, USA</i>
· I worked with Prof. Nathan Beckmann, on eviction policy for key-value caches.	
Cornell University <i>Research Assistant</i>	July 2015 - September 2015 <i>Ithaca, USA</i>
· I worked with Prof. Nate Foster. We built an end-host based data center traffic measurement system.	

SELECTED RESEARCH PROJECTS

Declarative programming for Ethereum smart contracts

FSE'22, ICSE'24

University of Pennsylvania

- We design and implement a declarative domain-specific language for Ethereum smart contracts, which allows programmers to succinctly express contract logic via declarative rules, and perform automatic formal verification. The project is featured in Smart Contract Research Forum.

Example-driven network protocol specification synthesis

APNet'18, IEEE/ACM ToN'22

University of Pennsylvania

- We propose a tool to synthesize network protocol specifications from input-output examples. The goal is to reduce the effort and expertise required to specify formal models for network protocols, thus accelerating the adoption of formal methods in networking practice.

TEACHING

CS247: Computer-aided Verification

Instructor

Spring 2024

ShanghaiTech University

CS120: Computer Networks

Instructor

Fall 2023

ShanghaiTech University

CIT595: Online Computer Systems Programming

Teaching Assistant

Spring 2020

University of Pennsylvania

CIS520: Machine Learning

Teaching Assistant

Spring 2020, Spring 2019

University of Pennsylvania

CIS 5617 Computer networking and communication

Guest Lecturer

Spring 2019

Temple University

SERVICE

Program committee: SoCC'2023

Review: IEEE Transaction on Software Engineering

Distributed Systems Laboratory Seminar

Organizer

Spring 2019, Fall 2019

University of Pennsylvania

REFERRED JOURNAL PUBLICATIONS

Synthesizing Formal Network Specifications from Input-Output Examples

2022

Haoxian Chen, Chenyuan Wu, Andrew Zhao, Mukund Raghothaman, Mayur Naik, Boon Thau Loo
IEEE/ACM Transactions on Networking (ToN)

SDPA: Toward a stateful data plane in software-defined networking

2017

Chen Sun, Jun Bi, Haoxian Chen, Hongxin Hu, Zhilong Zheng, Shuyong Zhu, and Chenghui Wu
IEEE/ACM Transactions on Networking (ToN)

REFERRED CONFERENCE AND WORKSHOP PUBLICATIONS

Verifying Declarative Smart Contracts

2024

Haoxian Chen, Lan Lu, Brendan Massey, Yuepeng Wang, Boon Thau Loo
IEEE/ACM International Conference on Software Engineering (ICSE)

Declarative Smart Contracts 2022
Haoxian Chen, Gerald Whitters, Mohammad Javad Amiri, Yuepeng Wang, Boon Thau Loo
ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE)

Interpretable Feedback for AutoML and a Proposal for Domain-customized AutoML for Networking 2021
Behnaz Arzani, Kevin Hsieh, and Haoxian Chen
Twentieth ACM Workshop on Hot Topics in Networks (HotNets)

Towards example-guided network synthesis 2018
Haoxian Chen, Anduo Wang, and Boon Thau Loo
Asia-Pacific Workshop on Networking (APNet)

LHD: Improving cache hit rate by maximizing hit density 2018
Nathan Beckmann, Haoxian Chen, and Asaf Cidon
USENIX Symposium on Networked Systems Design and Implementation (NSDI)

Felix: Implementing traffic measurement on end hosts using program analysis 2016
Haoxian Chen, Nate Foster, Jake Silverman, Michael Whittaker, Brandon Zhang, and Rene Zhang
Symposium on SDN Research (SOSR)

PERSONAL

Born and raised: 1994, Zhuhai, China.
Languages: Cantonese, Mandarin, English.

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