



Andrew K. Hirsch

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Research Interests & Objectives:

I use ideas from theory of programming languages to explore issues in computer security. I am especially interested in giving foundations to information-flow security and authorization. By using theoretical tools, I create principled, general mechanisms for enforcing security and proof techniques for verified-secure programs. Moreover, I develop those theoretical tools to give them the power needed to apply to security.

Keywords: • Information Security • Authorization • Programming Language Semantics • Program Verification • Mathematical Logic • Foundations of Mathematics

Education:

- 2019 **PhD**, Cornell University
Computer Science
Thesis: Semantics for Secure Software
Supervisor: Ross Tate
- 2016 **Master of Science**, Cornell University
Computer Science
- 2013 **Bachelor of Science**, The George Washington University
Computer Science & Pure Mathematics

Professional Appointments:

- 2019–Present Postdoctoral Researcher
Max Planck Institute for Software Systems
Saarbrücken, Germany

Publications:

Peer-Reviewed Conferences:

- 2021 *Giving Semantics to Program-Counter Labels via Secure Effects*
Andrew K. Hirsch and Ethan Cecchetti
Principles of Programming Languages (POPL)
DOI: Forthcoming
- 2020 *First-Order Logic for Flow-Limited Authorization*
Andrew K. Hirsch, Pedro H. Azevedo de Amorim, Ethan Cecchetti,
Ross Tate, and Owen Arden
Computer Security Foundations (CSF)
DOI: 10.1109/CSF49147.2020.00017
- 2018 *Strict and Lazy Semantics for Effects*
Andrew K. Hirsch and Ross Tate
International Conference on Functional Programming (ICFP)
DOI: 10.1145/3236783
- 2013 *Belief Semantics in Authorization Logic*
Andrew K. Hirsch and Michael R. Clarkson
Computer and Communications Security (CVS)
DOI: 10.1145/2508859.2516667

Workshops with Unpublished Proceedings:

- 2020 *Noninterference Half-Off*
Andrew K. Hirsch and Ethan Cecchetti
Foundations of Computer Security (FCS)
- 2019 *First-Order Logic for Flow-Limited Authorization*
Andrew K. Hirsch, Pedro H. Azevedo de Amorim, Ethan Cecchetti,
Ross Tate, and Owen Arden
Foundations of Computer Security (FCS)

Technical Reports:

- 2020 *First-Order Logic for Flow-Limited Authorization*
Andrew K. Hirsch, Pedro H. Azevedo de Amorim, Ethan Cecchetti,
Ross Tate, and Owen Arden
Max Planck Institute for Software Systems
URL: <https://arxiv.org/abs/2001.10630>
- 2013 *Belief Semantics of Authorization Logic*
Andrew K. Hirsch and Michael R. Clarkson
The George Washington University
URL: <https://arxiv.org/abs/1302.2123>
- 2012 *Nexus Authorization Logic (NAL): Logical Results*
Andrew K. Hirsch and Michael R. Clarkson
The George Washington University
URL: <https://arxiv.org/abs/1211.3700>

Service:

- 2020 Foundations of Computer Security (FCS)
Program Committee Member
- 2020 Principles of Programming Languages (POPL)
Artifact Evaluation Committee Member
- 2019 Eastern Great Lakes Programming Languages and Systems (EGLPLS)
Chair

Teaching Experience:

At Cornell University (As Graduate TA):

- Spring 2019 Advanced Programming Languages
- Spring 2018 Category Theory for Computer Scientists
- Fall 2017 Functional Programming and Data Structures
- Fall 2016 Programming Languages
- Spring 2014 Computer System Organization and Programming
- Fall 2013 Database Systems

At The George Washington University (As Undergraduate TA):

- Spring 2013 Principles of Programming Languages
- Fall 2012 Introduction to Mathematical Reasoning