

John C. Kolesar

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Education

Yale University

Ph.D., Computer Science

Advisor: Ruzica Piskac

Earned M.S. en route to Ph.D. in 2022

New Haven, Connecticut

2020–2026 (anticipated)

Cornell University

Bachelor of Arts with Distinction in All Subjects

Ithaca, New York

2016–2020

Majors:

- Mathematics (Magna cum Laude, Computer Science concentration)
- Classics (Latin concentration)

Minors:

- Computer Science
- Philosophy

Cumulative Grade Point Average: 3.97

Computer Science GPA: 4.02

Honors

Phi Beta Kappa

Cornell University College of Arts & Sciences

2020

Nathan Hale Associates Fellow

Yale Graduate School of Arts & Sciences

2021

Arts & Sciences Dean's List

Cornell University

All available semesters

Graduate Course Work Performance

Grade of H (maximum grade for Yale GSAS) in all graded graduate courses

Research Interests

- Programming Languages
- Formal Verification
- Cryptography
- Zero-Knowledge Proofs
- Symbolic Execution
- Software-Defined Networking
- Automatic Program Repair
- Competitive Programming
- Regular Expressions and KAT

Conference Publications

- Daniel Luick, Ning Luo, John Kolesar, Timos Antonopoulos, Xiao Wang, Eran Tromer, Ruzica Piskac. **Efficient Zero-Knowledge Proofs for First-Order Logic with Quantifiers**. Under Submission.
- John Kolesar, Timos Antonopoulos, Ruzica Piskac. **Validation of NetKAT Proof Certificates in Zero Knowledge**. Under Submission.
- Jialu Zhang, Jialiang Gu, Wangmeiyu Zhang, José Pablo Cambrero, John Kolesar, Ruzica Piskac, Daming Li, Hanyuan Shi. **A Systematic Study of Time Limit Exceeded Errors in Online Programming Assignments**. Under Submission.
- John Kolesar, Martin Schäfer, Robin Salkeld, Remy Willems, Willem Visser. **Enforceable Explainability Properties for Pricing Models**. Under Submission.
- John C. Kolesar, Shan Ali, Timos Antonopoulos, Ruzica Piskac. **Coinductive Proofs of Regular Expression Equivalence in Zero Knowledge**. *OOPSLA*, 2025.
- John Kolesar, Tancrede Lepoint, Martin Schäfer, Willem Visser. **Safe Validation of Pricing Agreements**. *ICSE*, 2025.
- Daniel Luick, John Kolesar, Timos Antonopoulos, William R. Harris, James Parker, Ruzica Piskac, Eran Tromer, Xiao Wang, Ning Luo. **ZKSMT: A VM for Proving SMT Theorems in Zero Knowledge**. *USENIX Security*, 2024.
- John C. Kolesar, Ruzica Piskac, William T. Hallahan. **Checking Equivalence in a Non-strict Language**. *OOPSLA*, 2022.
- Jialu Zhang, De Li, John C. Kolesar, Hanyuan Shi, Ruzica Piskac. **Automated Feedback Generation for Competition-Level Code**. *ASE*, 2022.

Journal Publications

- John C. Kolesar, Ruzica Piskac, William T. Hallahan. **Checking Equivalence in a Non-strict Language**. *Journal of Functional Programming*, 2025.

Talks

- ZK Proofs for SMT Theorems and Regular Expression Equivalence**
Carnegie Mellon University, CyLab Crypto Seminar *November 2024*
- Coinductive Proofs of Regular Expression Equivalence in Zero Knowledge**
FMCAD 2024 Student Forum *October 2024*
- ZKSMT: A VM for Proving SMT Theorems in Zero Knowledge**
New York University, NJPLS *May 2024*

Poster Presentations

- Coinductive Proofs of Regular Expression Equivalence in Zero Knowledge**
FMCAD 2024 Student Forum *October 2024*
- Checking Equivalence in a Non-strict Language**
Yale University *October 2023*

Industry Work Experience

- Amazon Web Services**
Applied Scientist Intern, New York City *Summer 2024, Summer 2025*

Manager: Martin Schäf
Team: AWS Billing

Microsoft One Engineering System

Research Intern, Remote
Supervisor: Josh Becker
Mentor: Grant Holliday

Summer 2022

Aretec Inc.

Big Data Software Application Developer
Contractor for U.S. Securities and Exchange Commission
New York City (2018)
Washington, D.C. (2019)

Summer 2018, Summer 2019

Mentoring Experience

Zero-Knowledge Regular Expression Equivalence
Shan Ali

Yale University
Summer 2024

Teaching Experience

Graduate Teaching Fellow at Yale University.....

CPSC 415/515: Law and Large Language Models

Taught by Ruzica Piskac and Scott Shapiro

Spring 2025

CPSC 458/558: Automated Decision Systems

Taught by Stephen Slade

Spring 2024

CPSC 323: Introduction to Systems Programming and Computer Organization

Taught by James Glenn and Jay Lim

Fall 2023

CPSC 484/584: Introduction to Human-Computer Interaction

Taught by Marynel Vázquez

Spring 2023

CPSC 435/535: Building an Internet Router

Taught by Robert Soule

Fall 2022

CPSC 433/533: Computer Networks

Taught by Anurag Khandelwal

Spring 2022

CPSC 323: Introduction to Systems Programming and Computer Organization

Taught by Ruzica Piskac and Rob Brunstad

Fall 2021

Undergraduate Teaching Assistant at Cornell University.....

CS 3110: Data Structures and Functional Programming

Taught by Nate Foster

Spring 2020

CS 4820: Introduction to Analysis of Algorithms

Taught by Eva Tardos

Fall 2019

CS 3110: Data Structures and Functional Programming

Taught by Michael Clarkson

Fall 2018

CS 2112: Honors Object-Oriented Design and Data Structures

Taught by Dexter Kozen

Fall 2017

Other Work, Research, and Volunteering Experience

Cornell University

Computer Science Research

Research Advisor: Nate Foster

Subject: Software-Defined Networking with P4

Ithaca, New York

Fall 2019, Spring 2020

Tenley Achievement Program

Office Manager

Washington, D.C.

Summer 2017

Yale University Computer Science Department

Graduate Student Advisory Committee Member

New Haven, Connecticut

2023–2024 Academic Year

Yale University Computer Science Department

New Ph.D. Student Mentor

New Haven, Connecticut

2023–2024, 2024–2025 Academic Years

National University of Colombia

Web Chair for LPAR 2023

Manizales, Colombia (remote)

June 2023

Squash Haven

Volunteer Tutor (Computer Science, Mathematics)

New Haven, Connecticut

Spring 2023, Fall 2023

Yale University Computer Science Department

Website Manager for Formal Methods Meetup 2023

New Haven, Connecticut

October 2023

Yale University Computer Science Department

Ph.D. Student Buddy for Admitted Student Day

New Haven, Connecticut

Spring 2022

Skills

- Proficiency in Java, C, C++, OCaml, Q, Haskell, Python, JavaScript, TypeScript, Dafny
- Experience with Coq, Standard ML, C#, Kusto, Langium, Lean
- Experience with SMT solvers, Excel, LaTeX, Unity, Blender, VirtualBox, Docker