John C. Kolesar

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Education

Yale University — **New Haven, Connecticut**
Ph.D., Computer Science — *2020–2026 (anticipated)*
Advisor: Ruzica Piskac
Earned M.S. en route to Ph.D. in 2022

Cornell University — **Ithaca, New York**
Bachelor of Arts with Distinction in All Subjects — *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

- John Kolesar, Timos Antonopoulos, Ruzica Piskac. **Validation of NetKAT Proof Certificates in Zero Knowledge.** Under Submission.
- Jialu Zhang, Jialiang Gu, Wangmeiyu Zhang, José Pablo Cambronero, 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 Schäf, Robin Salkeld, Remy Willems, Willem Visser. **Enforceable Explainability Properties for Pricing Models.** Under Preparation.
- John C. Kolesar, Shan Ali, Timos Antonopoulos, Ruzica Piskac. **Coinductive Proofs of Regular Expression Equivalence in Zero Knowledge.** *OOPSLA*, 2025.
- John Kolesar, Tancrède Lepoint, Martin Schäf, 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 *Summer 2022*
Supervisor: Josh Becker
Mentor: Grant Holliday

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

Mentoring Experience

Zero-Knowledge Regular Expression Equivalence **Yale University**
Shan Ali *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 — **Ithaca, New York**
Computer Science Research — *Fall 2019, Spring 2020*
Research Advisor: Nate Foster
Subject: Software-Defined Networking with P4

Tenley Achievement Program — **Washington, D.C.**
Office Manager — *Summer 2017*

Yale University Computer Science Department — **New Haven, Connecticut**
Graduate Student Advisory Committee Member — *2023–2024 Academic Year*

Yale University Computer Science Department — **New Haven, Connecticut**
New Ph.D. Student Mentor — *2023–2024, 2024–2025 Academic Years*

National University of Colombia — **Manizales, Colombia (remote)**
Web Chair for LPAR 2023 — *June 2023*

Squash Haven — **New Haven, Connecticut**
Volunteer Tutor (Computer Science, Mathematics) — *Spring 2023, Fall 2023*

Yale University Computer Science Department — **New Haven, Connecticut**
Website Manager for Formal Methods Meetup 2023 — *October 2023*

Yale University Computer Science Department — **New Haven, Connecticut**
Ph.D. Student Buddy for Admitted Student Day — *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