Joomy Korkut[1][2]

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Research Interests

Functional programming languages, compilers, type systems, and formal verification. I am particularly interested in applications of metaprogramming, property-based testing, and separation logic.

Education

- **Princeton University**, Princeton, NJ.
    - **Ph.D.**, *Computer Science.* September 2018 - November 2024
      Thesis: *Foreign Function Verification Through Metaprogramming.* Adviser: *Andrew W. Appel.*
    - **M.A.**, *Computer Science.* March 2023
- **Wesleyan University**, Middletown, CT.
    - **M.A.**, *Computer Science.* September 2017 - May 2018
      Thesis: *Edit-Time Tactics in Idris.* Adviser: *Daniel R. Licata.*
    - **B.A.**, *Computer Science* (with honors) and *Mathematics.* September 2013 - May 2017

Work and Research Experience

- **Researcher, Bloomberg L.P.**, New York, NY. (January 2024 - ongoing)
  Conducting formal verification research, developing certified programs, and writing research papers in the CTO Infrastructure and Security Research team.
- **Applied Scientist Intern, Amazon Web Services**, New York, NY. (May - August 2022)
  Worked with Ankush Das on lightweight verification of communication protocols in distributed systems, for a randomized testing tool in Rust.
- **Preceptor, Princeton University** (September 2019 - December 2022)
  Graded assignments, led precepts (recitations), held office hours for the following courses:
    - COS 326 - Functional Programming. (Fall 2019, Fall 2020 as head preceptor, Fall 2022)
- **Software Engineering Intern, Awake Security**, Sunnyvale, CA. (July - September 2018)
  Worked with Jeff Polakow, and contributed to the design of a functional programming language with row polymorphism for network queries and its implementation in Haskell.
- **Student Forum Leader, Wesleyan University** (Fall 2015, Spring 2018)
  Designed and taught a course on Haskell for credit, under the supervision of James Lipton.
- **Research in the Sciences Fellow, Wesleyan University** (May - August 2015, May - August 2016)
  Formalized the correctness and termination proofs of a regular expression matching algorithm using continuation passing style, in Agda. Formalized the compilation of the modal logic based functional language, in Agda. Under the supervision of Daniel R. Licata.
- **Course Assistant, Wesleyan University** (September 2014 - May 2018)
  Graded assignments, led tutor sessions, and occasionally gave lectures for the following courses:
    - COMP 115 - How to Design Programs. (Fall 2017, Spring 2018)
    - COMP 212 - Computer Science II. (Fall 2014, Spring 2015)
    - COMP 321 - Design of Programming Languages. (Fall 2015, Fall 2016, Fall 2017 (1 lecture))
    - COMP 360-01 - Computer-Checked Programs and Proofs (Spring 2016)
    - COMP 360-02 - Automated Theorem Proving (Spring 2016 (4 lectures))
- **Programmer, Instructional Media Services, Wesleyan University** (September 2013 - May 2015)
  Developed a calendar for staffing campus events with AV technicians.

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[1]Legal name: Cumhur Korkut.
[2]I am a U.S. permanent resident, therefore I am authorized to work in the U.S. and will not need sponsorship in the future.

Technical Skills

- Interactive theorem proving (Rocq, Agda, Idris)
- Functional programming (Haskell, OCaml, Standard ML, etc.)
- Web development (JavaScript, HTML, CSS, etc.)
- Other programming (Rust, C, Python, Prolog, LaTeX)

Publications and Other Academic Writing

- *A Verified Foreign Function Interface between Coq and C*, joint work with Kathrin Stark and Andrew W. Appel. POPL 2025.
- *A Proof Tree Builder for Sequent Calculus and Hoare Logic*, International Workshop on Theorem Proving Components for Educational Software. Haifa, Israel. (remote) (August 11th, 2022)
- *Morphology and Lexicon-based Machine Translation of Ottoman Turkish to Modern Turkish*. Self-published, 2019.
- *Extensible Type-Directed Editing*, joint work with David Thrane Christiansen. TyDe 2018.
- *Thinking Outside the □: Verified Compilation of ML5 to JavaScript*. Undergraduate thesis, 2018.
- *Intrinsic Verification of a Regular Expression Matcher*. joint work with Maksim Trifunovski and Daniel R. Licata. Self-published, 2016.

Talks

- *A Rose Tree is Blooming (Proof Pearl)*, New Jersey Programming Languages and Systems Seminar. New York, NY. (May 9th, 2025)
- *A Foreign Function Interface Between Coq and C*, New England Programming Languages and Systems Symposium. Boston, MA. (September 27th, 2024)
- *Foreign Function Verification Between Coq and C Through Metaprogramming*, Harvard Programming Languages Seminar. Boston, MA. (March 23rd, 2023)
- *Direct Reflection for Free!*
    - International Conference on Functional Programming (Student Research Competition, Graduate Category, 3rd place), Berlin, Germany (August 20th, 2019)
    - New York Seminar of Programming Languages and Software Engineering, CUNY Hunter College (February 25th, 2019)
- *Commanding Emacs from Coq*, Scheme Workshop, Berlin, Germany (August 18th, 2019)

Service

- Program Committee
    - Workshop on Principles of Secure Compilation (PriSC) 2026
- Artifact Evaluation Committee
    - Object-Oriented Programming, Systems, Languages & Applications (OOPSLA) 2024
    - International Conference on Functional Programming (ICFP) 2023, 2024
    - International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI) 2023, 2024

Last updated on August 15, 2025