

Research Interests

Compilers, type systems, formal verification, metaprogramming, symbolic natural language processing.

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 Prof. 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 Prof. 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.

¹Legal name: Cumhuri Korkut.

²I 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 (Coq, Agda, Idris)
- Functional programming (Haskell, OCaml, Standard ML, etc.)
- Web development (JavaScript, HTML, CSS, etc.)
- Other programming (Rust, C, Python, Prolog, L^AT_EX)

Publications and Other Academic Writing

- *A Verified Foreign Function Interface Between Coq and C*, joint work with Kathrin Stark and Andrew W. Appel. Submitted, 2024.
- *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. Type-Driven Development Workshop. (September 27th, 2018)
- *Thinking Outside the \square : 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 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)
- *Ergonomics and Verification of a Foreign Function Interface between Coq and C*, general exam talk at Princeton University (May 14th, 2020)
- *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

- 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