


Alperen Keles

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 alpaylan  Alperen Keles

Education

Doctorate of Philosophy - Computer Science 2021 - May 2026 (Expected)
University of Maryland, College Park Maryland, USA
Thesis: **Designing Effective Property-Based Testing Frameworks**

Bachelor of Engineering - Computer Engineering 2017 - 2021
Middle East Technical University Ankara, Turkey
GPA: 3.66/4.0 (top 5% in class of 229)

Publications

D4: Debugging Databases Under Development *under review*
Alperen Keles, Ethan Chou, Harrison Goldstein, Leonidas Lampropoulos

Etna: An Evaluation Platform for Property-Based Testing *under review*
Alperen Keles, Jessica Shi, Nikhil Kamath, Tin Nam Liu, Ceren Mert, Harrison Goldstein, Benjamin C. Pierce, Leonidas Lampropoulos

Deeper Properties for Programmable Testing *under review*
Alperen Keles, Justin Frank, Ceren Mert, Harrison Goldstein, Leonidas Lampropoulos

Tail: A Typed and Structured Document Editor POPL 2024 SRC
Alperen Keles

Etna: An Evaluation Platform for Property-Based Testing (Experience Report) ICFP 2023
Jessica Shi, **Alperen Keles**, Harrison Goldstein, Benjamin C. Pierce, Leonidas Lampropoulos

Protocol Verification Language CGO 2020 SRC
Alperen Keles, Ozan Akin, Ozan Sazak, Umut Sahin

DroPPPP: A P4 Approach to Mitigating DoS Attacks in SDN WISA 2019
Goksel Simsek, Hakan Bostan, Alper Kaan Sarica, Egemen Sarikaya, **Alperen Keles**, Pelin Angin, Hande Alemdar, Ertan Onur

Ongoing Research Projects

Debugging Databases Under Development Dec 2024 - Present
Working on random testing of an open source SQLite compatible OLTP database, found multiple logic and compatibility bugs, designed an embedded DSL for expressing correctness properties, developed a database testing infrastructure from scratch.
(Property-Based Testing, SQLite, Rust)

tjq (typed jq) Dec 2024 - Present
tjq is a gradual type system developed on top of jq, a json processing language.
(Gradual Types, Streams, Rust)

Tail Document Editor May 2023 - Present
Tail is a template oriented document editor, automatically constructing forms from page templates for novel editing flows.
(Rendering, Live Editing, Typescript)

ETNA Sep 2022 - Present
ETNA is an evaluation and analysis framework for PBT libraries.
(Property-Based Testing, Rust, Python, Haskell, Rocq, OCaml, Racket)

Work Experience

University of Maryland - PLUM Maryland, USA
- Graduate Research Assistant Aug 2022 - Present
Working with Leonidas Lampropoulos on the intersection of Property Based Testing, Fuzzing, and Formal Verification.

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| Datadog Inc. - Research Science Intern Working on grounding of LLM generated programs via random testing and formal modeling. (Large Language Models, Random Testing, Formal Verification) | New York, USA(Remote) Jul 2025 - Aug 2025 |
| Bloomberg L.P. - Research Intern Worked on developing executable semantics for inductive separation logic specifications in order to automatically derive property-based tests from separation logic propositions for testing C code. (Separation Logic, Property-Based Testing, C, OCaml, Rust) | New York, USA June 2024 - Aug 2024 |
| Amazon Web Services - Applied Science Intern - Privacy Engineering Developed a dataflow analysis method for a state machine based DSL. (Python, Java, Dataflow Analysis, Symbolic Execution, Abstract Interpretation) | New York, USA May 2023 - Aug 2023 |
| - Applied Science Intern - Privacy Engineering Implemented of a novel encryption scheme on top of the AWS Encryption SDK. (Python, Dafny) | May 2022 - Aug 2022 |
| University of Maryland - MC2 - Research Intern (Program Synthesis, Automatic Exploit Generation) | Maryland, USA(Remote) Jul 2020 - Dec 2020 |
| Havelsan - Part-Time Engineer Designed and implemented a novel bandwidth detection and optimization algorithm for a video-conference application. (Javascript, React) | Ankara, Turkey Jul 2020 - Jul 2021 |
| Emproof - Embedded Security Engineering Intern Worked on translation validation of binary obfuscation techniques. (C++, Z3 SMT Solver, ARM Assembly, Symbolic Execution) | Bochum, Germany Jun 2019 - Sep 2019 |
| Community Service | |
| ICSE 2026 Shadow Program Committee - Shadow Reviewer | Aug 2025 |
| extendr: Frictionless bindings for R and Rust - Reviewer | 10.21105/joss.06394 Jul 2024 |
| afetbilgi.com - Founder | afetbilgi.com Feb 2023 - Jul 2023 |
| ICFP Programming Contest - Co-Organizer of 26th Annual ICFP Programming Contest - Organizer of 25th Annual ICFP Programming Contest | Sep 2022 - Jul 2023 Jun 2022 - Sep 2022 |
| Talks | |
| Giving Types to jq | NJPLS May 2025 |
| Property-Based Testing: The Past, The Present, and The Future | Bobkonf 25 |
| Designing A Functional Document Processor | LambdaConf 2024 |
| Nitty Gritty Bits of Property-Based Testing | DC Systems 003 |
| Selected Articles | |
| Verifiability is the Limit | Mar 2025 |
| Solving Algorithmic Problems in the Wild | Mar 2024 |
| The Technical Pie | Jun 2023 |