


Alperen Keles

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 alpaylan  Alperen Keles

Education

Doctorate of Philosophy - Computer Science University of Maryland, College Park Thesis: Designing Effective Property-Based Testing Frameworks	2021 - May 2026 (Expected) Maryland, USA
Bachelor of Engineering - Computer Engineering Middle East Technical University GPA: 3.66/4.0 (top 5% in class of 229)	2017 - 2021 Ankara, Turkey

Publications

Deeper Properties for Programmable Testing (under review) <i>Alperen Keles, Justin Frank, Ceren Mert, Harrison Goldstein, Leonidas Lampropoulos</i>	OOPSLA 2025
Tail: A Typed and Structured Document Editor <i>Alperen Keles</i>	POPL 2024 SRC
Etna: An Evaluation Platform for Property-Based Testing (Experience Report) <i>Jessica Shi, Alperen Keles, Harrison Goldstein, Benjamin C. Pierce, Leonidas Lampropoulos</i>	ICFP 2023
Protocol Verification Language <i>Alperen Keles, Ozan Akin, Ozan Sazak, Umut Sahin</i>	CGO 2020 SRC
DroPPPP: A P4 Approach to Mitigating DoS Attacks in SDN <i>Goksel Simsek, Hakan Bostan, Alper Kaan Sarica, Egemen Sarikaya, Alperen Keles, Pelin Angin, Hande Alemdar, Ertan Onur</i>	WISA 2019

Ongoing Research Projects

Property-Based Testing Databases 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. (<i>Rust, SQLite, Property-Based Testing</i>)	Dec 2024 - Present
tjq (typed jq) tjq is a gradual type system developed on top of jq, a json processing language. (<i>Rust, Gradual and Structural Type Systems, Stream Semantics</i>)	Dec 2024 - Present
Tail Document Editor Tail is a template oriented document editor, automatically constructing forms from page templates for novel editing flows. (<i>Typescript, Rendering, Document Semantics</i>)	May 2023 - Present
ETNA ETNA is an evaluation and analysis framework for PBT libraries. (<i>Rust, Python, Coq, OCaml, Racket, Property-Based Testing</i>)	Sep 2022 - Present

Work Experience

University of Maryland - PLUM - Graduate Research Assistant Working with Leonidas Lampropoulos on the intersection of Property Based Testing, Fuzzing, and Formal Verification.	Maryland, USA Aug 2022 - Present
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. (<i>C, OCaml, Rust, Separation Logic, Property-Based Testing</i>)	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. (<i>Python, Java, Dataflow Analysis, Symbolic Execution, Abstract Interpretation</i>)	New York, USA May 2023 - Aug 2023

<ul style="list-style-type: none"> - Applied Science Intern - Privacy Engineering <p>Implemented of a novel encryption scheme on top of the AWS Encryption SDK. (Python, Dafny)</p>	May 2022 - Aug 2022
<p>University of Maryland - MC2</p> <ul style="list-style-type: none"> - Research Intern <p>(Program Synthesis, Automatic Exploit Generation)</p>	Maryland, USA(Remote) Jul 2020 - Dec 2020
<p>Havelsan</p> <ul style="list-style-type: none"> - Part-Time Engineer <p>Designed and implemented a novel bandwidth detection and optimization algorithm for a video-conference application. (Javascript, React)</p>	Ankara, Turkey Jul 2020 - Jul 2021
<p>Emproof</p> <ul style="list-style-type: none"> - Embedded Security Engineering Intern <p>Worked on translation validation of binary obfuscation techniques. (C++, Z3 SMT Solver, ARM Assembly, Symbolic Execution)</p>	Bochum, Germany Jun 2019 - Sep 2019
Community Service	
<p>extendr: Frictionless bindings for R and Rust</p> <ul style="list-style-type: none"> - Reviewer 	10.21105/joss.06394 Jul 2024
<p>afetbilgi.com</p> <ul style="list-style-type: none"> - Founder 	afetbilgi.com Feb 2023 - Jul 2023
<p>ICFP Programming Contest</p> <ul style="list-style-type: none"> - 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