

I'm a PhD candidate at [MPI-SP](#) working with [Cătălin Hrițcu](#) on building the first secure compilation framework for verified code. Such a framework enables secure interoperability between verified code and existing unverified code bases while providing strong security guarantees. Our first result is the first secure compiler for verified IO programs from the proof-oriented programming language F^* to OCaml (POPL'24). Looking for opportunities to make software better and more secure.

Skills

Skills: Formal Verification, Compilers, Programming Languages, Writing, Teaching.

Prog. Languages: F^* , OCaml, C/C++, Python, JavaScript, Dafny, Solidity, Haskell.

Software: Linux, Docker, AWS, Z3, SQL, Git.

Languages: Romanian (Native), English (Proficient), German (beginner)

Education

2021–25 **PhD candidate** in Computer Science at MPI-SP in Bochum, Germany (expected) working with Cătălin Hrițcu on *Secure interoperability between F^* and ML*.

2019 – 21 **MSc** in Computer Science from UAIC, Iași, Romania

2019 – 21 **MA** in Regional Development from UAIC

2015 – 19 **BSc** in Computer Science from UAIC

Selected Publications

2024 **POPL** [Securing Verified IO Programs Against Unverified Code in \$F^*\$](#)
Cezar-Constantin Andrici, Ștefan Ciobăcă, Cătălin Hrițcu, Guido Martínez, Exequiel Rivas, Éric Tanter and Théo Winterhalter
Proceedings of the ACM on Programming Languages (POPL 2024)

2022 **HOPE** [Verifying non-terminating programs with IO in \$F^*\$ \(Extended Abstract\)](#)
Cezar-Constantin Andrici, Théo Winterhalter, Cătălin Hrițcu and Exequiel Rivas
ACM SIGPLAN Workshop on Higher-Order Programming with Effects (HOPE 2022)

TYPES [Partial Dijkstra Monads for All \(Extended Abstract\)](#)
Théo Winterhalter, Cezar-Constantin Andrici, Cătălin Hrițcu, Kenji Maillard, Guido Martínez and Exequiel Rivas
International Conference on Types for Proofs and Programs (TYPES 2022)

[Who Verifies the Verifiers? A Computer-Checked Implementation of the DPLL Algorithm in Dafny](#)
Cezar-Constantin Andrici and Ștefan Ciobăcă
Journal Mathematics 2022

Research & Industry Experience

Research intern at [UAIC](#), Iași (from Feb 2020 to Jun and from Nov to Jul 2021)

➤ Implemented a [DPLL Solver in Dafny](#) and fully verified the functional correctness of

the solver by constructing machine-checked proofs of its soundness, completeness, and termination using first-order logic and SMT solving.

- Worked with [Stefan Ciobăcă](#)

Research intern with [Cătălin Hrițcu](#)

- at [Inria Paris](#) (Jul 2019 to Nov 2019) and [MPI-SP](#) (Jul 2020 to Oct 2020)
- Conducted a case study on using Dijkstra Monads in the F[★] language to give semantics and verify propositional trace properties of IO programs using higher-order logic and SMT solving. Worked also with [Exequiel Rivas](#).
- Exploratory research on how to achieve secure F[★]-ML interoperability for IO programs.

IT Specialist at [UAIC](#), Iași, Romania (Dec 2017 to June 2019)

- Built a new main website for the Faculty of Computer Science (still in use).
- Maintained network infrastructure and web services of the Faculty of Computer Science.

CTO at CTF365, Cluj, Romania (Nov 2015 to Nov 2017)

- CTF365 was a security startup - the main product was a security training platform that attracted several Fortune 500 companies as clients.
- Obtained a pre-seed round of investment from [hub:raum -Tech Incubator of Deutsche Telekom](#) after participating in a 5-week program in Krakow, Poland.
- Coordinated the technical team, created software solutions, managed full life-cycle software development, performed technical analysis and testing, led technical collaboration, and wrote technical documentation.

Software Development Intern at [Amazon Development Center](#), Romania (Jul '15 - Oct '15)

- Built a single-page application using only Amazon Web Services.

Awards & Grants

1st prize at Student Research Competition, graduates section, at the 25th ACM SIGPLAN International Conference on Functional Programming (ICFP 2020) with submission: Gradual Enforcement of IO Trace Properties.

Travel grant to participate in VMCAI Winter School, New Orleans, 2020.

Scientific performance scholarship from [UAIC](#), Iași, Romania. The scholarship was for 12 months and it was competitively awarded.

Participated four times in the National Computer Science Olympiad in Romania. My best rank was 4th out of 40 pupils, top 15 each time. Also, selected to participate once in the National Computer Science Olympiad from Bulgaria.

Numerous awards at contests of IT&C projects (e.g., [InfoEducație](#)), at local hackathons and events of entrepreneurship (e.g., [Startup weekend](#)).

Travel grants for exchange programs in Karlsruhe and Strasbourg. The travel grants were competitively awarded.

Teaching Experience

- 2024 **Functional Programming — RUB, Bochum**
Held weekly labs for a semester with small groups of students, developed automated grading technology
- 2020 **Logics in Computer Science — UAIC, Iași**
Held weekly labs for a semester with big groups of students

Presentations

- **Securing Verified IO Programs Against Unverified Code in F[★]** at the [F[★] PoP Up Seminar](#) (July 2023) - [video](#).
- **Gradual Enforcement of IO Trace Properties** at Student Research Competition, 25th ACM SIGPLAN International Conference on Functional Programming (ICFP 2020), online (Aug 2020) - [video](#).
- **Verification of IO behavior of programs in F[★]** at Faculty of Computer Science Seminar, Iași (Jan 2020).

Community Service

Sub-reviewer at POPL'24, SP'21

Member in Artifact Evaluation Committee at POPL'23

Student Volunteer at POPL'24, POPL'23, ICFP'22, PLDI'20, POPL'20, ETAPS'19, FROM'18

Judge in the national committee for the National Contest InfoEducație for pupils between 2016 and 2020, Romania. (pupils develop and present web or mobile apps)

Attended Summer Schools

- [Oregon Programming Languages Summer School 2024 \(USA, Boston\)](#)
- [The Cornell, Maryland, Max Planck Pre-doctoral Research School 2020 \(online\)](#)
- [Verification, Model Checking, and Abstract Interpretation \(VMCAI\) Winter School 2020 \(USA, New Orleans\)](#)
- [POPL Programming Languages Mentoring Workshop 2020 \(USA, New Orleans\)](#)
- [ETAPS Mentoring Workshop 2019 \(Czech Republic, Prague\)](#)
- ICUB - Coq Autumn School 2018 (Romania, Bucharest)

References

[Cătălin Hritcu](#) Tenured faculty at [MPI-SP](#), Bochum, Germany - catalin.hritcu@mpi-sp.org

[Éric Tanter](#) Full Professor at [University of Chile](#) - etanter@dcc.uchile.cl

[Ștefan Ciobâcă](#) Associate Professor at [UAIC](#), Iași, Romania - stefan.ciobaca@gmail.com