Andrei Lascu

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Employment History

Research Fellow, CREST, UCL 2025-2026
Research Associate, Software Development Team, King's College London 2021-2025

Education

PhD Computer Science, HiPEDS CDT, Imperial College London 2015 - 2021
MEng Computing degree, 2:1, Imperial College London 2010 - 2014
Romanian Baccalaureate, mark 9.66 2010

Research Projects

Information Theory Analysis Mar 2025 - Jun 2026

- Developed a practical application to improve test suite understanding using Uncertainty Coefficient (UC), providing an additional dimension for quantifying testability
- Implemented a LLVM IR based analysis tool, combining UC composability with finiteness of LLVM IR instructions and types
- Given an LLVM-compilable source file, abstract execution paths to UC values, thus analysing information flow and indicate code sections suitable for further testing on external oracles
- Further work focusing on output visualisation, scalability, and other applicability (e.g. path coverage)

CapableVMs - CHERI for Virtual Machines Sep 2021 - Feb 2025

- Explored the idea of porting Programming Language Virtual Machines to CHERI hardware, to improve security
- Implemented a software compartmentalisation proof-of-concept for precompiled user binaries
- Compartments can only access memory allocated to them, thus ensuring no secrets leak
- Implementation basis was a light-weight runtime loader, ensuring all operations are done natively within compartments

MF++ - Automated library metamorphic testing Jul 2018 - Nov 2021

- Designed a framework for writing high-level metamorphic relations, including providing automated reduction
- Found multiple bugs across mature libraries (e.g., `Z3`, `Yices2`, and `isl`)

GraphicsFuzz - OpenGL compiler testing Sep 2015 - Feb 2017

- Target OpenGL compilers via automatic generation and reduction of metamorphic shader kernels
- Found various compiler bugs across all major GPU vendors, as well as severe security issues via WebGL

Selected Publications

- Bramley et al., *Picking a CHERI allocator: Security and Performance Considerations*, ISMM'23
- Lascu et al., *Metamorphic Fuzzing of C++ Software Libraries*, ICST'22
- Donaldson et al., *Automated Testing of Graphics Shader Compilers*, OOPSLA'17
- Lidbury et al., *Many-core Compiler Fuzzing*, PLDI'15