Mikhail Razakov

Static Analysis / Program Analysis Engineer

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LinkedIn

I work on symbolic computation in SharpChecker at ISP RAS. My public projects cover an interprocedural LLVM optimization with legality checks, C17 memory-dependence analysis, and Roslyn CFG null-state analysis.

2022: Compilers / VMs · 2023: CIL + native x86-64 · 2024–2025: AST / IR / backends → toolchain · 2026 →: LLVM + program analysis

PROFESSIONAL EXPERIENCE

October 2026 — present

ISP RAS — SharpChecker development

- Work on symbolic computation in SharpChecker, a C#/.NET static-analysis tool.

July — August 2026

MCST — Compiler Engineering Intern

- Implemented a LICM pass for LLVM 22 in C++; hoisting conditions check loop structure, memory access, side effects, and speculative safety.
- Built a Python harness comparing program behavior before/after optimization and checking transform/no-transform cases.

PROJECTS

LLVM Interprocedural Global IV Optimization

An LLVM 22 pass localizes supported induction-like globals after interprocedural effect analysis, affine evolution, and a separate applicability check; APInt models fixed-width wraparound.

29 positive/negative regression cases cover LLVM Verifier checks, structural expectations, idempotence, and observable before/after behavior.

PS-form Memory Dependence Analyzer

Built a C17 memory-dependence analyzer combining exact affine iteration-pair counting, modular/GCD disjointness proofs, and conservative maybe for unresolved cases.

Cross-checks use an independent exact small-domain oracle and randomized/metamorphic cases; failure to find a witness never proves no.

DerefAfterNullAnalyzer

A Roslyn ControlFlowGraph analyzer propagates null state on conditional edges to a fixed point, joins predecessor states, and reprocesses successors for loops/back edges.

Method/property/field/index/event dereferences; invalidation after assignment/ref/out; dedicated analyzer tests use Microsoft.CodeAnalysis.CSharp.Testing.

SKILLS

Data-flow Analysis
Roslyn CFG, worklist/fixed point, edge refinement, predecessor joins, loops/back edges

Interprocedural / LLVM
effects analysis, affine evolution, APInt, transformation applicability, LLVM IR

Analysis Correctness
assignment/ref/out invalidation, conservative unsupported-case handling, regression tests, LLVM Verifier

Languages / Tools
C#, C++23, Roslyn, LLVM 22, .NET

EDUCATION

HSE University — Software Engineering

RECOGNITION

MCST LLVM/C++ selection
Organizer correspondence: only 5.0/5.0 score and only solution passing all 104/104 tests among 49 submissions.

LangDev'26 — Build the Language, Then Make the Abstractions Disappear
Delivered the UniversalToolchain architecture talk at LangDev on 9 October 2026.

HSE Faculty of Computer Science — open-source projects competition
Selected as one of the winners with UniversalToolchain / Wist2.

Earlier distinctions
MEPhI Junior: Information Technologies section winner in 2025 and first-degree diploma in 2026; HSE Vysshaya Proba Industrial Programming diploma holder; Baltic Science and Engineering Competition: first-degree diploma and the "Perfection as Hope" prize.

Moscow / remote