




Summer Report

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AI-Guided Symbolic Execution


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✓ Infrastructure for training

✓ Basic dataset

✓ Basic integration with USVM

✓ Basic evaluation

 Full integration with USVM

 Dataset extension

 GNN improvement and training

 Performance tuning

Searcher	UTBot test suite				SBST comp			
	Coverage	Steps	Tests	Errors	Coverage	Steps	Tests	Errors
AI	87.76	61.02	2.34	0.59	79.39	63.03	1.65	0.34
BFS	88.25	83.01	3.81	0.87	80.74	154.95	1.98	0.58
ForkDepth	88.55	82.50	3.56	1.26	79.62	77.08	1.81	1.23
ForkDepthRnd	88.45	76.93	3.68	0.92	80.74	124.25	1.88	0.47

Other Projects

- ✓ Datalog-based static code analysis (Rustam Azimov)
 - ☹ Pure Datalog is not flexible enough
 - ⚙ Switched to IFDS-based analysis
- ⚙ SAT on GPGPU (Egor Orachev)
 - ✓ First prototype (CPU)
 - ⚙ GNN + SAT + GPGPU: can it be used in $\mathcal{AI} + SE$ pipeline
- ⚙ High-performance graph analysis (Egor Orachev, Igor Erin, Artemii Patov)
 - 📄 Spla: Generalized Sparse Linear Algebra Library with Vendor-Agnostic GPUs Acceleration. Egor Orachev, Semyon Grigorev
 - ★ IEEE High Performance Extreme Computing Conference (25–29 September 2023)
 - ★ Outstanding Short Paper Award
 - ⚙ Core refactoring
 - ⚙ Package publishing