Daniil **Tiganov**

Security Analysis Intern @ Synopsys, Calgary

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Summary

I am interested in program analysis tools that can be deployed and used by developers in the industry. I put high priority in making software usable and maintainable. Unlike many current program analysis tools and frameworks, I want my work to be well documented and easy to integrate into developers workflows and development processes.

Education

University of Alberta

Edmonton, Alberta, Canada

BSc Computing Science — *Sept. 2016 - Exp. Dec. 2021*

- 3.6 GPA

Research

The Maple Lab, University of Alberta

Edmonton, Alberta, Canada

Part-time Research Assistant (not official) — *Jan 2020 - PRESENT*

- Supervisor: Dr. Karim Ali
- Working on rebuilding SWAN to have better Swift language support, analysis capabilities, scalability, and usability. This work is currently closed-source.

The Maple Lab, University of Alberta

Edmonton, Alberta, Canada

Research Assistant — *May 2019 - Dec 2019*

- Supervisor: Dr. Karim Ali
- Developed SWAN, a static program analysis framework for Swift, in cooperation with IBM.
- Documented and overhauled framework to be more modular and maintainable.
- Rewrote SIL to WALA CAst translator.
- Wrote a custom SWAN-specific IR with parser.
- Developed a VSCode and CLI tool frontend.

Work Experience

Synopsys

Calgary, Alberta, Canada

Security Analysis Intern — *Jan. 2020 - Dec. 2020*

- Worked on the Calgary Analysis Team lead by Thierry Lavoie.

Greentree Engineering

Tisdale, Saskatchewan, Canada

Surveyor/General Labourer — *May 2018 - Aug. 2018*

- Wrote a GUI tool in Python that addressed a bottleneck in topological surveying. The tool was used on multiple job sites.
- Gained practical GIS experience by surveying and laser scanning agricultural sites, and staking construction entities, such as roads, concrete foundations, and excavations.

Greentree Engineering

Tisdale, Saskatchewan, Canada

General Labourer — *Jun. 2017 - Aug. 2017*

- Maintained 7 properties.
- Renovated a house - demolition, drywall, plumbing, electrical, window installation, and wall framing.

Beeland Co-op Home Center

Tisdale, Saskatchewan, Canada

Student Position — *Jul. 2015 - Jun. 2016*

- Provided support to customers regarding paint, plumbing, electrical, vanities, electric mowers, yard tractors, and tools.
- Assembled yard tractors, trailers, and air compressors.

Publications

Daniil Tiganov, Jeff Cho, Karim Ali, and Julian Dolby. "SWAN: A Static Analysis Framework for Swift." *ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering*, 2020

ESEC/FSE '20

Tool Paper

Academic Achievements

2018/2019 **Dean's Honor Roll,** University of Alberta

2017/2018 **Dean's Honor Roll,** University of Alberta

Projects

SWASAR

CMPUT 497, University of Alberta *Jan. 2019 - Apr., 2019*

- **Keywords:** C++, LLVM, Phasar, Static program analysis
- This project was an attempt at implementing taint analysis on Swift applications using Phasar, an LLVM static analysis framework.
- LLVM IR generated from the Swift compiler is fed to a modified Phasar analysis to find the presence of taints in the Swift source code. The taint analysis was successful, but using an LLVM analysis framework is not ideal for analyzing Swift applications.

QuickTopo

Prairium *Jul. 2018 - PRESENT*

- **Keywords:** JavaScript, Go, Mapbox GL JS, GeoJSON, Leadership, Web, GIS
- I currently lead a team of 3 other developers under the name Prairium. We are working on developing an independent commercial solution, QuickTopo, to address a bottleneck in the topological surveying process, especially in the area of agriculture.
- I have developed and used a prototype for this software when I was working as a surveyor for Greentree Engineering. We hope any surveyor needing to do a significant topological survey can utilize our tool to save time and money.

CloudCity

HackEd 2019 *Jan. 2019*

- **Keywords:** C++, openFrameworks, Game design
- My team and I developed a simple city building game about population management using openFrameworks for HackED 2019.
- There were many challenges because openFrameworks is not a game engine, but rather a creative coding framework. We had to figure out seemingly simple problems which we solved through low level solutions (e.g., selecting tiles/buildings was solved by manual ray-tracing from the cursor).

Cluedo Assistant Tool (CAT)

Personal project *Oct. 2018 - Dec. 2018*

- **Keywords:** C#, WPF, Desktop application design
- I made a simple desktop application using WPF to assist in keeping track of moves and cards in the game of Cluedo.

DoctorPlzSaveMe

CMPUT 301, University of Alberta *Sep. 2018 - Dec. 2018*

- **Keywords:** Android, Leadership, Mobile application development
- I took on the role of project lead and backend developer for this course project.
- We developed an app that allows users to track/record their medical issues and receive feedback from a care provider.

Other Projects

- **Starcraft 2 bot** - CMPUT 350 project: I helped develop a bot based on CommandCenter and pitted it against other teams' bots. I worked on siege tank and resource gathering AI.
- **Black Hole Visualizer** - I attempted to visualize a spinning black hole using openFrameworks for an ASTRO creative assignment. The result is good enough to roughly represent how particles are affected by a black hole. This work was later presented at a teaching conference by one of the course coordinators.
- **Laser Tag Pistol** - I 3D-printed, built, and programmed a custom laser tag pistol. It uses a Teensy for a micro-controller, produces various sounds, has LED animations, and can receive/send unique IR signals (to be able to differentiate between teams, for instance).
- **Automatic deadbolt opener** - I 3D printed, built, and programmed a remote-based automatic deadbolt opener for my dorm.

Skills

Proficient	C/C++, Java, Scala, JavaScript
Familiar	Go, Kotlin, Swift, C#, Python, MIPS Assembly, Arduino
Tools/Frameworks	WALA, openFrameworks, VueJS, AngularJS, WPF, JavaFX, Mapbox GL JS
IDEs	IntelliJ IDEA, Visual Studio, Qt Creator
Other	Land surveying and laser scanning (Trimble TSC3, SurveyPro, RTK GNSS, Trimble TX5), Skid-Steer, SolidWorks
Languages	English, Russian