Sankarasubramanian Ganesh (Shankar Ganesh)

CONTACT
INFORMATION

◇ *email*: shankargss@icloud.com

◇ *website*: https://ravenheartss.github.io/

EDUCATION

◇ University of Calgary, Calgary, AB Canada
Master of Science (M.Sc.) in Computer Science
Convocated Winter 2024
Thesis: FrAG: A Framework for Automated Game Analysis
Advisor: Prof. John Aycock

◇ University of Calgary, Calgary, AB Canada
Bachelor of Science (B.Sc.) in Computer Science
Convocated Spring 2021 with Distinction
Dean's List, Faculty of Science

AWARDS

◇ Best Paper Award, Foundations of Digital Games Conference (2022)

◇ International Student Graduate Tuition Award (2021–2024)

◇ Dean's List, Faculty of Science (2018–2020)

PUBLICATIONS

◇ Shankar Ganesh, Matthew Michaud, Akil Fletcher, John Aycock, Katie Biittner and Carl Therrien. 2025. Replaying Early Video Game History: The Channel F. Sidestone Press. In press.

◇ S. Ganesh, J. Aycock and K. Biittner, FrAG: A Framework for the Analysis of Games. 2023 IEEE Conference on Games (CoG), Boston, MA, USA, 2023, pp. 1-4.

◇ John Aycock, Shankar Ganesh, Katie Biittner, Paul Allen Newell, and Carl Therrien. 2022. The Sincerest Form of Flattery: Large-Scale Analysis of Code Re-Use in Atari 2600 Games. In Proceedings of the 17th International Conference on the Foundations of Digital Games (FDG 22). Association for Computing Machinery, New York, NY, USA, Article 26, 1-10.

CONFERENCES &
WORKSHOPS

◇ Contributed talk at the IEEE Conference on Games 2023 (Virtual), Boston MA, Aug. 23, 2023.

◇ Workshop: Platform studies and code reading, *History of Games* (Virtual), Nov. 8, 2022.

◇ Contributed talk at the Blockchain Technology Symposium 2022 (Virtual), Jun. 9, 2022.

Projects & Research Experience	◇ Replaying Early Video Game History: The Channel F · Used the AI-driven framework FrAG to reveal patterns in game implementation, such as memory usage. · Reverse engineered Channel F games for in-depth analysis with FrAG. ◇ FrAG: A Framework for the Analysis of Games · Designed and developed an automated framework for analysis of video games within the MAME emulator. · Created a novel "point disassembler" that leverages execution data to distinguish code from data in ROM images improving disassembly accuracy, aiding in reverse engineering ROMs. · Conducted extensive evaluation of FrAG using a test suite of Atari 2600 games, demonstrating its effectiveness in game analysis and reverse engineering. ◇ Security Analysis of Android Crypto Wallets · Reverse engineered a collection of popular Android cryptocurrency wallets implementing Bitcoin Improvement Protocol 32. · Performed static analysis and threat modeling to identify potential security vulnerabilities and privacy issues. · Uncovered concerning practices, such as storing master keys on the device with insufficient security measures, highlighting risks for users. ◇ A Network Analysis and Interactive Visualizer of UofC CPSC Courses · Developed a graph-based model to analyze and optimize course paths in the Computer Science curriculum at the University of Calgary, identifying bottleneck courses and potential redundancies in course prerequisites. · Created an interactive course visualizer tool using JavaScript to aid students in navigating course prerequisites and exploring potential academic paths. · Performed a comparative analysis of the 2009 and current curricula, highlighting shifts in course offerings and trends towards practical and engineering-focused computer science education. ◇ Reverse Engineering Tide · Reverse engineered Tide, an Android application, uncovering a collection of private identifiers in violation of Google Play Store policies. ◇ Large Scale Analysis of Code Re-Use in Atari 2600 Games · Developed tools to identify and analyze shared code sequences across 1.984 Atari 2600 game ROM images. · Investigated patterns of code re-use at multiple levels, offering insights into the early software development practices.
Teaching	◇ Teaching Assistant, CPSC 525/625: Principles of Computer Security, University of Calgary (Fall 2023). ◇ Teaching Assistant, CPSC 411: Compiler Construction, University of Calgary (Winter 2023). ◇ Teaching Assistant, CPSC 525/625: Principles of Computer Security, University of Calgary (Fall 2022). ◇ Teaching Assistant, CPSC 411: Compiler Construction, University of Calgary (Winter 2022)

· Nominated for Teaching Excellence Award.

LANGUAGES

◇ Programming: C, C++, Go, Rust, Python, Java, Bash, ARMv8 Assembly

◇ Other: Flex, Bison, LaTeX, LLVM, make, Git

◇ Languages: Tamil (native proficiency), English (native proficiency), Hindi (professional proficiency)