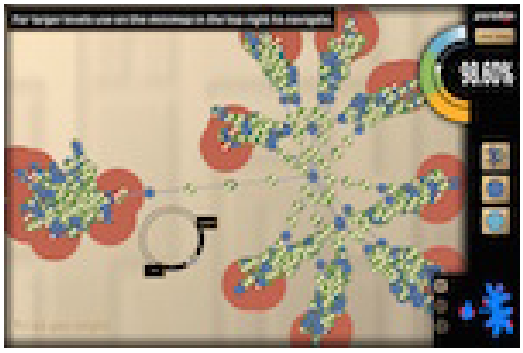
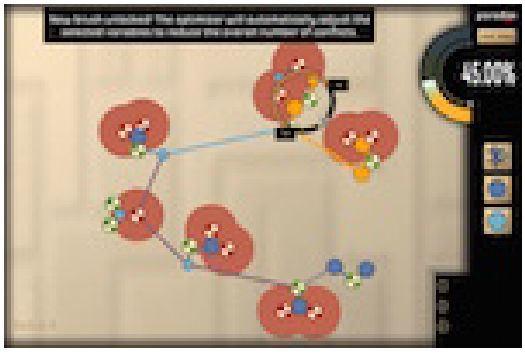
Paradox Launch Helps Keep Software Secure Through Gaming

DARPA Crowd Sourced Formal Verification Program Launches New Round of Games



SEATTLE, WA. – <<May 28, 2015>> The University of Washington today announced "Paradox," a puzzle-style video game that helps to assure software. A person who plays Paradox seems to be doing a task like in other puzzle games: manipulating pieces in each level to obtain the best score. At the same time, and without any knowledge of computer programming, the player is also generating a proof that a program is secure -- that is, it is free from certain security vulnerabilities. This is possible because each Paradox level is generated based on properties of real-world software code. Each completed game either proves a security property, or it gives specific information about unprovable code to computer experts.

Paradox introduces innovative gameplay mechanics that combine the best of human and automated analysis. As the game progresses, the puzzles grow more difficult and more complex. (That is, players prove more and more complex properties about software code.) Since these large levels are difficult to manage manually, Paradox introduces a new “painting” interface that allows players to interact with large numbers of elements at once and to delegate low-level tasks to computer agents. “Players are given multiple paintbrushes that correspond to different operations being performed on the level. They can ‘paint’ over different areas of the level with those effects in order to find the best possible solution,” explains developer Tim Pavlik.



Formal verification is a way of proving the absence of certain flaws in software code, but it is costly and time-consuming because only highly trained experts can perform the task. DARPA's Crowd Sourced Formal Verification (CSFV) program aims to make verification cheaper and more widespread by transforming the task into fun and engaging video games that anyone can play. CSFV has brought together leading software verification experts with top game designers and serious game developers to design and implement this novel approach to creating secure software. The Paradox game was built by UW’s Center for Game Science and the Programming Languages and Software Engineering group.

Paradox is currently available at http://paradox.verigames.com/

About Verigames

Verigames offers free online games to help with formal verification, which confirms the absence of certain software flaws or bugs. CSFV aims to investigate whether large numbers of non-experts can perform formal verification faster and more cost-effectively than conventional processes.

About the UW Center for Game Science

The Center for Game Science at the University of Washington focuses on solving hard problems facing humanity today in a game based environment. Our focus is on scientific discovery games, games that discover optimal learning pathways for STEM education, cognitive skill training games, games that promote human creativity, games that explore collective over individual intelligence, and many more.

About the UW CSE Programming Languages and Software Engineering Group

UW CSE's Programming Languages and Software Engineering (PLSE) group advances fundamental research and develops solutions to real-world problems in computer programming. Our research has led to advances in type systems, software testing, parallel and concurrent programming, formal verification, program synthesis, approximate computing, web programming, and more.