

GrammaTech Helps BCA Ensure Reliability of Life-Saving Mobile App

Bay Computer Associates (BCA) is an electronics and software design firm whose clients include Motorola and Johnson & Johnson, as well as multiple startup companies. BCA brings product design expertise to a wide variety of applications. Today, about half of its business comes from medical devices. Recently, BCA designed ZOLL Medical's PocketCPR® for iPhone, a life-saving mobile app that monitors force of motion. It measures compression depth to teach responders how to correctly perform CPR. When one of its clients, a medical products manufacturer, requested advanced static analysis tools be used in the development process, BCA chose GrammaTech's CodeSonar®.

BCA works on a number of client projects simultaneously, leveraging a shared codebase where possible. Before the adoption of GrammaTech's static analysis, developers relied on visual code inspections and ad hoc tools. However, this was painstaking and time consuming. For this reason, the company was excited to add advanced static analysis to automate the process. BCA selected CodeSonar because of its strong reputation in the medical device industry, and because it could be configured easily to fit the company's workflow.

Adopting CodeSonar® for Static Analysis

According to Dave Frey, BCA co-founder and director of software engineering, the transition to using CodeSonar was smooth. CodeSonar can be pointed to any code directory and reports are aggregated on a company server that is accessible from any of the company's workstations. Frey recalled that when GrammaTech initially visited BCA's facility to demonstrate CodeSonar, he had requested that CodeSonar be used to analyze the code from one of the company's active projects. He said CodeSonar was quickly and easily installed and configured.

BCA has been using CodeSonar for about nine months, and engineers on projects across the company are embracing the tool. "I'll tell you what amazes me is that CodeSonar works like it's advertised," said Frey. "It actually runs through complex loop and logic constructs and analyzes every single branch of that construct and will find something that no human would ever find by just looking at it."

"As every programmer knows, just because a statement executes correctly once, does not mean it will always do so — it may trigger an error only under a very unusual set of circumstances," said Paul Anderson, Vice President of Engineering at GrammaTech. "This is where CodeSonar shines. It examines paths and considers conditions and program states in the abstract. By doing so, it can achieve much higher coverage of code than is usually feasible with testing."



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– **Dave Frey,**
Co-Founder and
Director of Software
Engineering

Menu
◀ ▶

Place Device



Place device between hands or strap device on top of hand





PocketCPR.
Training Use Only



Call for help

"CodeSonar saves time in digging out things like memory leaks and buffer overruns. It will show you exactly the line of code where the problem is, so you don't have to hunt through hundreds of lines of code to find a problem."

– Firmware Engineer, BCA

Bay Computer Associates and its client Bio-Detek introduced their CPR iPhone application. The product is an aid for training CPR. The iPhone is held against the chest of the victim during CPR and the system provides audio and visual cues as to the recommended depth and frequency of CPR compressions. Using proper CPR technique is clearly a factor in the potential for life saving.

Saving Time During Product Development

A typical project at BCA will have system level firmware and application software, all implemented in C. The application software is first implemented on a PC simulator so the user interface can be refined. "I think we see the most benefit during code integration," said Frey. "When the application software is integrated with the system firmware, CodeSonar helps speed the debugging and results in better code quality when the project goes into the testing phase."

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Frey noted more and more clients are requesting that static code analysis be used during product development. In some cases, clients request the printed results of static analysis to facilitate the regulatory approval process. However, BCA uses CodeSonar whether customers ask for it or not. Frey concluded, "It's a great product! We are using it on everything now. Non-medical products, as well, and the client has no idea we are using it. We are still using it to make sure that our code is sound."



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