

SuperTest - helping to deliver a better development environment for ARM Cortex MCUs

UK based SOMNIUM Technologies offers software development tools to deliver smaller, faster, more energy efficient embedded systems in shorter time-scales.

For a company that stakes its reputation on the quality of its tool set, comprehensive compiler testing is a must.

“SOMNIUM® is a Freescale Proven Partner, and developed the Kinetis Design Studio (KDS) IDE product for Freescale. Being able to prove the correctness of the compiler output was instrumental in winning the contract to develop KDS,” says Dave Edwards, SOMNIUM’s chief technology officer.

From the start of the development, SOMNIUM used SuperTest™ to identify code generation bugs in the compiler.

“SuperTest allowed us to robustly test the code generation flow, and during testing we discovered several bugs. Being able to find them early in the development process was key to fixing them before product release,” says Dave. “Most of our competitors use a common build of the GNU toolset, and it’s well known that this contains a number of bugs which the GCC test suite doesn’t detect. GNU testing alone doesn’t provide anywhere near enough test coverage. Our experience with SuperTest is that it not only provides significantly better coverage, but also does it with less run time and better reporting.”

In addition to KDS, Freescale also wanted a value-added development environment offering seamless migration for customers seeking to accelerate product development and achieve the best possible results. This is where SOMNIUM’s leading expertise in code optimization is coming into play.

“We currently focus on supporting Freescale’s Kinetis MCUs with our patented DRT (Device-aware Resequencing Tool) technology,” says Dave.

“The problem with traditional compilers is that they only know about the MCU’s ARM® Cortex® instruction set architecture. They don’t take into account other system resources, such as the architecture of on-chip volatile and non-volatile memory systems, or real-time performance and power consumption requirements imposed by the application. After using traditional compilers, designers might well be fooled into thinking they need more on-chip resources than they really do, which in high volume

applications can lead to a significant increase in bottom-line costs.”

SOMNIUM’s DRT technology takes control from the first stage of code generation within the compiler to minimize memory requirements as well as time- and energy-consuming memory accesses. When linking multiple files together, DRT continues to rearrange and resequence the instruction and data sequences originally output by the compiler. Because this step significantly modifies the compiler’s output, it is extremely important that it does not introduce ‘bad code’ errors.

That’s why the SuperTest compiler test and validation suite from Solid Sands is a core component of SOMNIUM’s testing program, being run on a regular basis to check the quality of all its code generation tools.

“We recognize that SuperTest is an extremely useful suite of tests, so we run it every few days as an integral part of our regression testing. We use it to check programs for functional correctness, run-time failures and code size, as well as using it to benchmark other tools in terms of correctness and code size,” says Dave. “We looked at other tools but we are convinced that SuperTest continues to give us the best coverage as well as being a very useful tool for isolating problems.”

SOMNIUM Technologies has been using SuperTest for several years, and the emergence of Solid Sands as a company dedicated to supporting and enhancing SuperTest is welcome news for SOMNIUM.

“We definitely think Solid Sands can help us to maintain the quality of our software tools, so when we pitch for new business we absolutely highlight that SuperTest is part of our strategy to deliver products with the best possible correctness and competitiveness. We are currently broadening our product range to support an even wider range of devices, and SuperTest helps us to work more efficiently. The results our DRT technology delivers speak for themselves.”



SOMNIUM[®] Technologies is a UK based supplier of embedded software development tools. We believe that software development tools have not evolved to match problems faced when designing modern embedded systems. Using our founders' experience in both microprocessor architecture and development tools implementation, our revolutionary, 100% industry compatible solutions offer unique benefits to software developers working with ARM[®] Cortex[®] devices. Put simply, developers using SOMNIUM's products will reach the market faster, with higher performance, greater energy efficiency and more profitable designs.



Solid Sands is based in Amsterdam, the Netherlands. Our mission is to improve the quality of C and C++ compilers, and their safe and secure use by providing the best possible compiler validation suite. Due to the close relationship with the SuperTest users, their feedback on our updates and suggestions on how to improve, we continuously expand and renew SuperTest. With our knowledge of past, current and upcoming versions of the C standard, new analysis and optimizations techniques and new compiler use cases, Solid Sands stays at the fore-front of compiler testing and validation.

SOLID SANDS

from Amsterdam is the one-stop shop
for C and C++ compiler testing,
validation and safety services.