



OSC, partners receive portion of multi-million dollar Defense contract

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Defense Advanced Research Projects Agency awards USC-led team \$3.6M:

In collaboration with the University of Southern California's Information Sciences Institute, who was awarded a Defense Advanced Research Projects Agency (DARPA) contract, the Ohio Supercomputer Center will help demonstrate the benefits of high performance computing, defensecritical modeling and simulation solutions for the Department of Defense supply chain.

As part of OSC's Blue Collar Computing program, the Center received \$815,000 of the \$3.6 million contract on HPC-ISP Study Extension for two pilot projects – Electromagnetic Interference (EMI) Simulator and Military Vehicle Weight Reduction.

The Blue Collar Computing program helps companies gain access to supercomputing technology at an affordable cost. In addition to supercomputer access, Blue Collar Computing provides assistance with product and process design, with an emphasis on virtual prototyping through modeling and simulation, to reduce the time, cost and effort of bringing a product to market.

For the DARPA subcontract, OSC is partnering with ACES and Composites DOC, LLC, to support the development of high performance computing and real-time modeling solutions for military suppliers IAP Research, Inc. and AlphaStar. OSC will provide the expertise for HPC hosting, user interface design and implementation, data storage and provide experience with applications that leverage secure, remote access to HPC systems, such as Web-based user interfaces and programmatic job control.

"Secondary and tertiary suppliers to Department of Defense contractors often are small businesses that do not have access to high performance computing technology or systems," said Ashok Krishnamurthy, senior director of research at the Ohio Supercomputer Center. "Just as we've found Blue Collar Computing benefits civilian small businesses, we expect these pilot projects to show that HPC can benefit all levels of the military's supply chain."

The first project seeks to decrease the need for IAP to build and test physical prototypes, while reducing the electromagnetic interference for major U.S. Navy electrical systems. OSC has partnered with simulation and modeling experts at ACES to develop technology infrastructures that will enable engineers to model systems level designs using high performance computing.

"IAP designs power processing equipment for ship-based power modules, which

maintain electricity in emergencies," said Jeff Crompton, principal of ACES. "Implementing high performance computing applications with OSC will allow IAP to simulate the equipment's electromagnetic interference signature thus allowing them to optimize circuit design without the need for time consuming and expensive prototype testing."

In the second project, OSC has partnered with Composites DOC, a company that specializes in simulation and modeling of composite structures. By virtually designing, fabricating and testing improved models, the work will pursue reducing the chassis weight of military vehicles through the use of composite materials.

"We're fortunate to have had the computer power to model vehicle components, but the process was cumbersome. The limited resources meant having to produce subassemblies, make assumptions on boundary conditions, simulate individual strength and stress, then plug the subassembly change back into the whole vehicle for verification," said Brian Knouff, president, Composites DOC. "By tapping the supercomputers at the Ohio Supercomputer Center, we now can model the vehicle's entire stability and endurance, which will enable us to better develop conceptual designs and business plans for commercialization."

Collaborators with USC on other parts of the overall contract include Council on Competitiveness, Pratt & Whitney and California State University.

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