



The Knowledge Flows Both Ways



This month's *CrossTalk* theme, "Commercial and Military Applications Meet," initially evoked thoughts of the 1960s U.S. space program. Numerous everyday items came out of new developments from NASA's program to land a man on the moon. When I read the articles contained in this month's issue, I realized that this knowledge transfer is by no means a one-way transition.

Much of what drives military acquisition today is an interest in integrating hardware and software that are used successfully in commercial enterprises. So, what we see is not only new technology originally developed for military systems being transitioned into commercial use, but significant commercial equipment also being adopted for wide military use. Government and industry partnerships also play a significant role in new technology developments.

Our first article, *Upgrading Global Air Traffic Management*, contains highlights of an interview with John Schneider, program manager at Rockwell Collins. Schneider discusses the testing of a new Global Air Traffic Management system on the KC-135 military aircraft. The requirements for this system derived from a merging of the commercial requirements with the military requirements in order to equip aircraft and make them compliant with civilian requirements to ensure full access to global airspace.

Since 9-11, we are more aware of the complex challenge to control our nation's airspace with increases in air transportation. In *Airport Simulations Using Distributed Computational Resources*, authors William J. McDermott, Dr. David A. Maluf, Yuri Gawdiak, and Peter B. Tran discuss the NASA and Federal Aviation Administration goal to develop technologies that will result in a significant reduction in aviation accidents in the next five to 10 years. While this requires a simulation environment with more computing power than is normally available, the authors offer an alternate solution: using multiple computers distributed throughout the country connected through a common network.

The widespread use of global positioning system (GPS) technology and the proliferation of commercial GPS receivers pose a major dilemma for our military: How do you protect U.S. and allied forces from hostile use of the civil GPS signal during critical military operations? In *SAASM and Direct P(Y) Signal Acquisition*, authors Steve Callaghan and Hugo Fruehauf talk about the advances in cryptography and keying techniques that will alleviate the security risks associated with this proliferation.

In *Improving Information Management Software System Deployment Practices*, authors Dr. James A. Forbes, Maj. Kurt Bodiford, and Dr. Emanuel R. Baker describe a project to improve the deployment of software-intensive information management systems. Surveys of both Army Program Management Offices and commercial organizations showed that deployment problems were due to a lack of sharing and replication of best practices across product offices. The authors believe their findings will be of use to other organizations dealing with similar problems.

Digital identification needs have grown – old-fashioned bar codes that we now take for granted in everything we purchase are no longer sufficient for advanced usage. In *Pilot Testing Innovative Auto ID Technologies*, James E. Bagley describes how the aerospace-government-industry partnership is leading the way in implementation of new automatic identification technology.

The historical tutorial, *Steganography*, by 2nd Lt. James Caldwell provides context for this instrument of security, which is used to hide messages within a physical cover message. Although awareness and progress are unfolding to expose steganographic applications, the advanced computer technology of today holds some interesting network security risks that must be appreciated.

Dr. Kevin R. Slocum of the U.S. Army Engineer Research and Development Center, and Lt. Col. John R. Surdu, 2nd Lt. Jeffrey Sullivan, 2nd Lt. Marek Rudak, 2nd Lt. Nathan Colvin, and Cadet Christopher Gates from the U.S. Military Academy author our final article, *Trafficability Analysis Engine*. They cover their development efforts for a tool to measure how easily vehicles can drive through a particular piece of terrain and discuss some needed future work to enhance the application.

I hope this month's articles provide some insight into the dimension of applications that link our military and commercial worlds, and how current efforts are focused on trying to take advantage of both. We hope that one or more of these articles are useful for your current endeavors.

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