

DO&IT Seminar Series

Speaker: Amy R. Pritchett
Director, NASA Aviation Safety Program

Date: Friday, March 27, 2009

Time: 3:00-4:30 pm

Location: VMH 1336

Title: Verification and Validation of Flight-Critical Systems:
How Can We Make IT Very Safe and Reasonably Affordable?

Abstract: The modern airplane can be considered a computer peripheral, and the Next Generation Air Transportation System a massive network of automated agents acting on a system-wide information sharing. For example, emerging aircraft technologies seek to enable health management systems with 100's of sensors across the vehicle, adaptive control systems responding to changes in aircraft properties, and advanced flightdeck systems that will communicate with other aircraft and ground systems to optimize their own flight profile and overall airspace capacity – oh, and there's a pilot in there somewhere.

Commercial air transport in the developed world is arguably the safety domain ever. Proving that IT systems meet this high level of safety – verification and validation or 'V & V' – is more expensive than designing and producing them. Flight-critical software V & V can cost up to \$2000 per line of code – this for systems that will have millions of lines of code. At the same time, the federal government has chartered the multi-agency & industry 'Joint Planning and Development Office' (JPDO) with designing the Next Generation Air Transportation System to enable two and three-fold increases in airspace capacity and dramatic reductions in aviation's environmental impact, while further increasing safety.

The JPDO has identified V & V of flight critical systems as a critical gap towards their longer-term goals. This presentation will outline a nascent effort underway in NASA's Aviation Safety Research Program to provide innovative approaches to V & V of flight-critical software and to complex, interactive multi-agent system designs, and to argument-based approaches to validating system requirements of large-scale systems.

Bio: Amy Pritchett is currently serving a two-year term as Director of NASA's Aviation Safety Program, which is chartered to provide the nation's mid- and long-term research in civil aviation safety. She is on-loan to NASA via an IPA from Georgia Tech, where she is the David S. Lewis Associate Professor in Aerospace Engineering, with a joint appointment in Industrial and Systems Engineering. She received her S.B., S.M. and Sc.D. degrees from MIT.