Formal Methods Applications in Air Transportation

Todd Farley
NASA Ames Research Center
Moffett Field, CA

Abstract

The U.S. air transportation system is the most productive in the world, moving far more people and goods than any other. It is also the safest system in the world, thanks in part to its venerable air traffic control system. But as demand for air travel continues to grow, the air traffic control system's aging infrastructure and labor-intensive procedures are impinging on its ability to keep pace with demand. And that impinges on the growth of our economy.

Air traffic control modernization has long held the promise of a more efficient air transportation system. Part of NASA's current mission is to develop advanced automation and operational concepts that will expand the capacity of our national airspace system while still maintaining its excellent record for safety. It is a challenging mission, as efforts to modernize have, for decades, been hamstrung by the inability to assure safety to the satisfaction of system operators, system regulators, and/or the traveling public.

In this talk, we'll provide a brief history of air traffic control, focusing on the tension between efficiency and safety assurance, and the promise of formal methods going forward.

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