Verification and Validation of Flight-Critical Systems

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Abstract

For the first time in many years, the NASA budget presented to congress calls for a focused effort on the verification and validation (V&V) of complex systems. This is mostly motivated by the results of the VVFCS (V&V of Flight-Critical Systems) study, which should materialize as a a concrete effort under the Aviation Safety program. This talk will present the results of the study, from requirements coming out of discussions with the FAA and the Joint Planning and Development Office (JPDO) to technical plan addressing the issue, and its proposed current and future V&V research agenda, which will be addressed by NASA Ames, Langley, and Dryden as well as external partners through NASA Research Announcements (NRA) calls. This agenda calls for pushing V&V earlier in the life cycle and take advantage of formal methods to increase safety and reduce cost of V&V. I will present the on-going research work (especially the four main technical areas: Safety Assurance, Distributed Systems, Authority and Autonomy, and Software-Intensive Systems), possible extensions, and how VVFCS plans on grounding the research in realistic examples, including an intended V&V test-bench based on an Integrated Modular Avionics (IMA) architecture and hosted by Dryden.