Announcing the Final Examination of Alex Rummel for the degree of Master of Science

Time & Location: June 7, 2018 at 11:00 AM in ENG2 312L
Title: Equivalency Analysis of Sidestick Controller Modes During Manual Flight

Equivalency analysis is a statistical procedure that can enhance the findings of an analysis of variance in the case when non-significant differences are identified. The demonstration of functional equivalence or the absence of practical differences is useful to designers introducing new technologies to the flight deck. Proving functional equivalence is an effective means to justify the implementation of new technologies that must be "the same or better" than previous technology. This study examines the functional equivalency of three operational modes of a new active control sidestick during normal operations while performing manual piloting tasks. Data from a between-subjects, repeated-measures simulator test was analyzed using analysis of variance and equivalency analysis. Ten pilots participated in the simulator test which was conducted in a fixed-base, business jet simulator. Pilots performed maneuvers such as climbing and descending turns and ILS approaches using three sidestick modes: active, unlinked, and passive. RMS error for airspeed, flight path angle, and bank angle were measured in addition to touchdown points on the runway relative to centerline and runway threshold. Results indicate that the three operational modes are functionally equivalent when performing climbing and descending turns. Active and unlinked modes were found to be functionally equivalent when flying an ILS approach, but the passive mode, by a small margin, was not found to be functionally equivalent.

Major: Industrial Engineering

Educational Career:
Bachelor's of Aerospace Engineering, BS, 2014, Virginia Polytechnic Institute and State University

Committee in Charge:
Waldemar Karwowski, Chair, Industrial Engineering & Management Systems
Ahmad Elshennawy, Industrial Engineering & Management Systems
Peter Hancock, Industrial Engineering & Management Systems

Approved for distribution by Waldemar Karwowski, Committee Chair, on May 23, 2018.

The public is welcome to attend.