Announcing the Final Examination of August Mark for the degree of Doctor of Philosophy

Time & Location: March 20, 2019 at 3:00 PM in ENG2 202a
Title: DECENTRALIZED CONSENSUS-BASED CONTROL ALLOCATION FOR SOME DYNAMICAL SYSTEMS

In this dissertation, three separate studies, wherein techniques from graph theory and consensus control are used to address control allocation problems, are presented. In the first study, a decentralized allocator is presented for synthetic jet actuators and control surfaces onboard a small unmanned aerial vehicle to cooperatively generate desired aerodynamic moments. First order linear dynamics are assumed for both the synthetic jet actuators and control surfaces. A weighted consensus algorithm with limited feedback is used for the aerodynamic moment contribution allocator considering constraints. In the second study, the same allocation problem as in the first study is considered, but the actuator dynamics are now assumed to behave according to second order nonlinear dynamics. In the third study, a spray allocator is presented for an array of nozzles used to cool a large heated surface in order to address the local disagreement in surface temperature within sprayed sections. Within each study, the stability of each system is proven, and the performance of each allocator is demonstrated via simulations.

Major: Mechanical Engineering

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Approved for distribution by Yunjun Xu, Committee Chair, on March 5, 2019.

The public is welcome to attend.