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Improved Hamiltonian adaptive control of rotational mechanics

Adaptive control techniques often adapt control commands based upon errors tracking trajectories and/or estimation errors. Direct adaptive control techniques typically directly adapt the control signal without translation of estimated parameters. Indirect adaptive control techniques indirectly adapt the control signal by translating the estimates of unknown system parameters to formulate a control signal. The adaptation rule is derived using a proof that demonstrates the elimination of tracking errors (the true objective) and demonstrates stability, which is complicated by the nonlinear closed loop system. This presentation will elaborate on such techniques applied to rotational mechanics with time-varying mass.

Biography

Timothy Sands completed his PhD at the Naval Post-graduate School and Post-doctoral studies at Stanford University and Columbia University. He is Dean and Senior Military Professor at the Air Force Institute of Technology's School of Strategic Force Studies. He has published research prolifically in archival journals, conference proceedings, a book chapter, in addition to keynote and invitational presentations and holds one patent in spacecraft attitude control.

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