Technische Universität Berlin
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Vortragsankündigung

Seminar Regelungssysteme LV 0430 L 654

Montag, 26. April 2010, 13:30 Uhr
Vortragsort: EN 223

Prof. Alan F. Lynch
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"Design and Implementation of an Inertial Navigation System for a Helicopter UAV"

Helicopter unmanned aerial vehicles (UAVs) benefit from vertical takeoff and landing, hover, low-speed, and cruising flight capabilities. This versatility has the expense of nonlinear, unstable, and underactuated system dynamics. These challenges and numerous potential applications make the helicopter UAV an interesting testbed for nonlinear control. A platform for such development has been established in the Applied Nonlinear Controls Lab (ANCL) at the University of Alberta. A miniature helicopter was augmented with a manual/autonomous takeover system and the ANCL Avionics. This payload contains a global positioning system (GPS) receiver, inertial sensors, and communications and computing hardware. Allan variance analysis of inertial sensor data enabled the development of a magnetometer-plus-GPS-aided inertial navigation system that was implemented on the ANCL Avionics. Performance validation of this algorithm was demonstrated in simulation and experimental ground and flight tests.