

Wednesday May 6th, 14:30-15:30

Automation and Certification of Unmanned Aircraft



Speaker: Winfried Lohmiller (& Manuel Barriopedro), Executive Expert, Airbus

Short Bio: Winfried Lohmiller is an Executive Expert at Airbus Defence and Space for 'Overall Aircraft System'. He joined DaimlerChrysler Aerospace (the precursor of Airbus Defence and Space) in 1998 in Munich. Since then, he has supported the technologies and development of different unmanned aircrafts (SLG Sys, Barracuda, Talarion, Zephyr) as well as hydrogen driven aircrafts (Tanan and Eurodrone) in different leadership roles. He started his career in the Flight Control System of Eurofighter. Afterwards he supported as GNC Senior Expert the development of the A400M mission and navigation system and the Eurofighter's communication system. Today his focus is the provision of technologies for the Next Generation Weapon System. He is the Airbus DS representative at DGLR, AAE and BDLI Forum Luftfahrt.

He graduated in 1996 in Aerospace Engineering from the University of Stuttgart. He then took a Ph.D. at MIT in Mechanical Engineering. Since 1995 he is scientist at the MIT Nonlinear System Lab where he and Prof. Slotine invented 'Contraction Theory' which became today a standard stability technique to investigate nonlinear system dynamics.

Abstract: Remotely Piloted Aircraft Systems (RPAS) have become more and more present in our civil life. In addition, they get more and more relevant for state and military applications. This presentation first summarizes key missions and applications of RPAS, differentiating the aircraft in range versus payload. Based on a standard generic RPAS architecture the basics of mission autonomy, intelligence, level of autonomy and operator influence are introduced. This is illustrated for the case of Sirtap or Eurodrone. Then the key certification principles of RPAS are introduced. This is illustrated on the decomposition of aircraft loss rate (CS-25 or STANAG-4671) with the goal to protect persons on the ground. Specific key issues on the certification are illustrated for the following examples: Redundant pitch control; Automation, covering emergency responses or contingency management; Redundancy of engines vs. Crash sites; Collision avoidance for RPAS; Certifiable ATOL; and Airframe & FCS design.