

## Plenary Talk

# “Model-Based Design of Robust Autonomous Aerospace Systems”

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### **Abstract:**

Development of autonomous aircraft systems capable of accomplishing complex missions faces challenges due to the uncertainties coming from operating in a hostile cluttered urban environment, distributed nature of the implementation platform, the dynamic nature of the communication and computation resources. Model-based robust design is difficult because of complexity of the hybrid dynamic models including continuous vehicle dynamics and discrete models of computations and communications.

We will overview recent advances in methodology and tools to model, analyze, and design robust autonomous aerospace systems operating in uncertain environment, with stress on efficient uncertainty quantification and robust design using the case studies of the missions including model-based target tracking and search.

### **Short Bio:**

Andrzej Banaszuk is a Fellow and Acting Controls Systems Group Leader at United Technologies Research Center. Since joining UTRC in 1997, Andrzej Banaszuk has conducted research in control design for flutter, stall, combustion instability, flow separation, and mixing in jet engines. His recent interest is design and control of large networks of uncertain dynamical systems with applications to surveillance networks, building occupancy estimation, electric power networks, and autonomous operations of multiple UAVs. He holds Ph.D. in Electrical Engineering from Warsaw University of Technology and Ph.D. in Mathematics from Georgia Institute of Technology. Before joining UTRC he was performing academic research in linear and nonlinear control theory.

Andrzej Banaszuk is an author of 41 journal papers, 62 conference papers, and 6 patents. From 1999 to 2002 he was an Associate Editor of IEEE TCST. He was appointed to the Board of Governors of IEEE Control Systems Society in 2004. For his work on active and passive control of flow instabilities in jet engines he received IEEE Controls Systems Technology Award in 2007.