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Friday, 4th May 2018
Starting at 12:15 hours, MAKS Room 414

12:15 **Flying Air Taxis: A Solution to the Traffic Problem in Malta?**

Prof. Dr. Heinrich H. Bülthoff
Max Planck Institute for Biological Cybernetics, Tübingen, Germany

Entrance is free, but a place may be reserved by sending an email to:
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Flying Air Taxis: A Solution to the Traffic Problem in Malta?

ABSTRACT

Considering the prevailing congestion problems with ground-based transportation and the anticipated growth of traffic in the coming decades, a major challenge is to find solutions that combine the best of ground-based and air-based transportation. The optimal solution would consist in creating a personal air transport system (PATS) that can overcome the environmental and financial costs associated with all of our current methods of transport.

In the European project (www.myCopter.eu, 2011-2014) we proposed an integrated approach to enable the first viable PATS based on Personal Aerial Vehicles (PAVs) envisioned for travelling between homes and working places, and for flying at low altitude in urban environments. The project was aimed to pave the way for PAVs to be used by the general public within the context of such a transport system.

The myCopter project has not been the only development aiming at making personal aviation a reality. The last five years has seen a surge in research and development activities in this direction around the globe. The development activities have resulted in, amongst many other achievements, the first manned flight of a certified electric multicopter (e-Volo), an accessible microlight production aircraft (e-Go) and a prototype autonomous air taxi (Ehang). Tech-giants, such as Google, Uber and aircraft manufacturers, such as Airbus, have launched their own initiatives. We see now prototypes with vertical take-off and landing capabilities but many questions (eg., autonomy, safety, handling qualities and training) raised in the myCopter project have not yet been addressed in detail.

In a follow-up project at the Max Planck Institute for Biological Cybernetics we looked specifically at the question how we can make flying these vehicles as easy as driving a car. This presentation shows that existing civil light helicopters can be augmented to achieve dynamics and handling qualities suitable for PAVs. Furthermore, a novel haptic trainer is described to teach pilots how to stabilize the PAV-helicopter in case of automation failure. The haptic trainer is suitable for flight simulators and is based on control algorithms that adaptively varies the intensity of the haptic guidance force on pilot control devices. The level of control authority of the pilot is gradually increased based on his performance, until the simulator behaves like a real (un-augmented) helicopter. Experiments show that naïve pilots can stabilize the un-augmented helicopter after just 2 hours of training. This haptic trainer could therefore be a time saving tool for simulator training of PAV and helicopter pilots.

SPEAKER'S PROFILE

Heinrich Bülthoff is a scientific member of the Max Planck Society and director at the Max Planck Institute for Biological Cybernetics in Tübingen. He is head of the Department Human Perception, Cognition and Action in which a group of about 50 researchers investigate psychophysical and computational aspects of higher level visual processes in recognition and categorization, perception and action in virtual environments, human-robot interaction and human perception in aviation. He holds a Ph.D. degree in the natural sciences from the Eberhard-Karls-Universität in Tübingen. From 1980 to 1988 he worked as a research scientist at the Max Planck Institute for Biological Cybernetics and the Massachusetts Institute of Technology. He was Assistant, Associate and Full Professor of Cognitive Science at Brown University in Providence from 1988-1993 before becoming director at the Max Planck Institute for Biological Cybernetics. He is Honorary Professor at the Eberhard-Karls-Universität (Tübingen) and was Adjunct Professor at Korea University (Seoul) and founding editor of the ACM Transactions on Applied Perception and editor of other international journals. Heinrich Bülthoff is involved in many international collaborations and member of several European research networks. He has participated in many projects funded by the European Commission and was head of the EU myCopter project on Enabling Technologies for Personal Aerial Transportation Systems.