

myCopter

newsletter #1

This is the first newsletter for the project **myCopter**, which started on 1 January 2011 and is funded by the European Union under the 7th Framework Program.

Project motivation

The **myCopter** project is motivated by the results from the "Out of the Box" study commissioned by the European Commission [1]. In this study, radical new ideas were proposed for the air transport system. A Personal Aerial Transportation System was recommended as a potential solution to increasing congestion problems on European roads. Our project will investigate the enabling technologies that can provide the basis for such a system.



Our energetic team is ready to tackle the project challenges.

Project kickoff meeting

The kickoff meeting was held at the **Max Planck Institute for Biological Cybernetics** in Tübingen, Germany. Representatives of all project partners were present to discuss the directions of the project in the first year and to solidly align research goals.

Furthermore, this was a good opportunity to welcome new researchers to the project and to showcase the resources of the department for Human Perception, Cognition, and Action. For example, the CyberMotion Simulator and the Trackinglab are state-of-the-art facilities for research into human perception and human-machine interaction.

<http://www.mycopter.eu>

The **myCopter** project is funded by the European Union under the 7th Framework Program. This bi-annual newsletter is published by the **Max Planck Institute for Biological Cybernetics** for the **myCopter** project.

Scientific progress

The **myCopter** project has been running for slightly over 8 months. The project partners have started the necessary groundwork for their respective research areas. Below, a brief overview is given of three recent advancements.

Requirements for a reference PAV

To create a framework for the work of all partners a common baseline for an envisioned PAV was created. It was decided that the **myCopter** project should focus on a small vehicle with a single seat and the option to take an additional passenger with reduced baggage capabilities. For commuting purposes the range should be 100 km, with a cruising speed of 150-200 km/h.

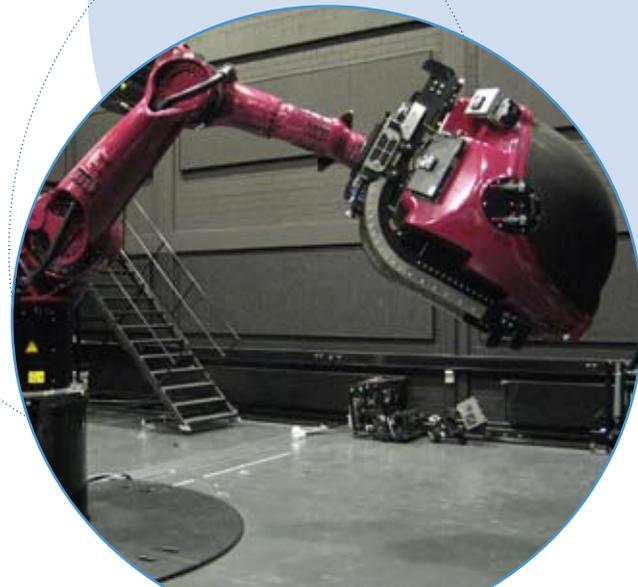
The PAV should have vertical take-off and landing capabilities, and full automation. It should be able to fly in Visual and Instrumental Meteorological Conditions (VMC/IMC) and should be useable 90% of the year in different weather conditions. The PAV will not be an aircraft that would also drive on roads like a car, but it should be manoeuvrable on the ground for parking and storage.

These requirements specify our reference PAV, which will be used for model development and socio-technological evaluations. It will also serve as a reference for the design of automation algorithms and human-machine interfaces.

Initial vehicle model

The first flight simulation model for PAV dynamics was delivered in August by The University of Liverpool. This model is a generic representation of PAV-like flight behaviour. It can be rapidly configured to represent vehicle response types that confer different levels of handling qualities upon the simulated PAV. Therefore it is an excellent resource for preliminary investigations by partners throughout the consortium into the range of dynamic responses for piloted flight.

The CyberMotion Simulator will be used for investigations into human-machine interaction



The model has been tested in handling qualities evaluations on the HELIFLIGHT-R simulator at The University of Liverpool. Future versions of the model will focus on using physical modelling principles and the addition of automatic flight modes and more command types.



The HELIFLIGHT-R simulator is used for model validations.

UAV hardware selection

The partners working on automation of PAVs have selected an Unmanned Aerial Vehicle (UAV) as a demonstrator for the automation algorithms that will be developed in the project. The platform that was selected is based on a quadcopter design with embedded stabilisation algorithms that can carry enough payload for autonomous operation. The UAVs will be equipped with traditional sensors such as GPS, an Inertial Measurement Unit, and a magnetometer. Furthermore, a down-facing camera with a fish-eye lens and front-facing camera will be used for vision-based control algorithms. As fast technology advancements are expected in this area of research, it is foreseen that other sensor types and hardware upgrades will be made during the course of the project.

Conferences

All papers published within the myCopter project can be found on our webpage in the [publication database](#).

Aerodays 2011 [2]

Heinrich Bülthoff presented the myCopter project at the Sixth European Aerodays, in a session about the "Rotorcraft of the Future". The aim of the event was to bring together aeronautics stakeholders, ministries, agencies and R&D centres from all over Europe and overseas to network, present their latest research results and discuss future R&D projects.

Royal Aeronautical Society: The Future Rotorcraft [3]

The first conference paper for the myCopter project was presented at the Royal Aeronautical Society conference on "The Future Rotorcraft" that was held on 15 and 16 June 2011 in London, United Kingdom. Mike Jump from The University of Liverpool presented some of the early thinking on each of the key project topic areas and argued that the key reason that many PAV concepts have failed is because the operational infrastructure and socio-economic issues have not been properly addressed. The paper can be downloaded [here](#).

European Rotorcraft Forum 2011 [4]

An early progress report of the project was presented at the 37th European Rotorcraft Forum 2011 in Gallarate, Italy. The conference paper focuses on the reference set of PAV requirements that were defined by the consortium and the initial non-physical flight model that will be used for evaluations on flight simulators. The paper can be downloaded [here](#).

Upcoming project meeting

The first periodic project meeting will be held in October at The University of Liverpool, United Kingdom. At this meeting the results from the first 8 months of the project will be evaluated and plans for the coming months will be solidified between the project partners.

In the press

In recent months, more than 20 news articles concerning the myCopter project have appeared in the press, such as in [The Engineer](#), [Gizmag](#), [New Scientist](#), and [Technology Review](#), and on the internet. For more examples visit our [website](#).

References

- [1] Truman, T. and A. de Graaff, Out of the Box. Ideas About the Future of Air Transport. November 2007, European Commission, Brussels.
- [2] Bülthoff, H. H., myCopter – Enabling Technologies for Personal Aerial Transportation Systems. Aerodays 2011, Madrid, Spain.
- [3] Jump, M, et al., myCopter – Enabling Technologies for Personal Air Transport Systems. The Future Rotorcraft, Royal Aeronautical Society, London, UK.
- [4] Jump, M, et al., myCopter: Enabling Technologies for Personal Air Transport Systems – An Early Progress Report. European Rotorcraft Forum 2011, Gallarate, Italy.