

# Europe looks into helicopter commuting

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A European research program is studying the feasibility of a new kind of individual transport that avoids traffic jams by taking to the skies. Two laboratories at EPFL participate in this project.

It's still in the realm of science fiction – but perhaps not for long. Soon, the “commute” between home and work may be as easy as a ride in an elevator. This is the long-term vision of the “myCopter” research project, funded via the European Commission’s Seventh Framework Programme (FP7) for Research and Technological Development.

Making [helicopters](#) as common a vehicle as cars are today might seem far-fetched. But it's based on a very serious observation: "Road infrastructures are totally saturated during rush hours, and it will soon be neither possible nor desirable to build new freeways," analyzes Heinrich Bülthoff, professor at the Max Planck Institute for Biological Cybernetics in Tübingen (Germany) and the initiator of the myCopter project. "The only solution is to think outside the box, and add a third dimension to the commuter's trajectory."

Between this childlike fantasy – who hasn't wanted to fly? – and the ominous vision of a swarm of machines buzzing around our cities, there is a whole world to put in place. And it's one on which several universities have been working since January: in addition to the Max Planck Institute, collaborators of myCopter include the University of Liverpool, EPFL, ETH Zurich, the Karlsruhe Institute of Technology and the German Aerospace Center (DLR). The project and its partners are being presented today in London, at a conference of the Royal Aeronautical Society.

## **Building the pieces of the puzzle**

EPFL has been a partner of the myCopter project from the outset. Two teams are involved: the Computer Vision Laboratory (CVLab) and the Laboratory of Intelligent Systems (LIS). "At this stage, we're not designing the flying machine itself," explains Felix Schill, a postdoctoral researcher in LIS working on the project. "What Europe is looking for in this initial phase is for us to develop everything that will enable large-scale deployment of this kind of mode of transportation."



Artist's view of an individual flying vehicle. Credit: Flight Stability and Control

Many problems – and not just technical ones – must be tackled. Laws will have to be modified, and considerable social impact is expected. Infrastructures must be planned for “parking” the vehicles at commuters’ workplaces. The user interface must make it possible for anyone to avail him or herself of a vehicle without having to undergo an inordinate amount of training. Energy considerations are also a factor, even though EPFL calculated several years ago that an individual electric flying vehicle with a counter-rotating rotor would be able to cover twenty kilometers on battery power alone – a distance well within the range (as the crow flies) of most commuters’ routes.

## **A priority on safety**

The four-year, 4.2 million-Euro research project is spread over several areas. EPFL is primarily involved in studying how several flying vehicles interact together. “Passenger safety is obviously one of the most sensitive issues,” continues Schill. “We have to establish extremely reliable systems in order to prevent collisions.” This involves the development of various detection and communications tools. “We have already put microphones on drones,” he explains. “With an algorithm that muffles noise, they can hear the sound of other motors and determine their

positions. But we still need to be able to localize birds and other flying objects.”

The safety requirements will undoubtedly result in extremely redundant systems. The scientists are working on improving radar technology, for example, taking it to a smaller scale and to new frequencies, an element that is generating interest in the automobile industry. In parallel, the CVLab is working on video recognition of other vehicles and landing sites.

In addition, and with an eye to a wide distribution of this new kind of transportation, the researchers are studying how these vehicles could fly together – or alone. Do we need to create “skyways”? Teach them how to fly in formation, like migrating birds? Or should each one just take its own path? Research already underway using drones flying in formation could be continued in the context of this project.

MyCopter is thus leveraging research in many areas, and the results will be useful far beyond just these mini-helicopters - and well before they’re coming off production lines. “But I’m planning on proposing another research project within the next couple of years, this time with industrial partners, to look at the vehicles themselves,” anticipates Bühlhoff.

Provided by Ecole Polytechnique Federale de Lausanne

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