Swarms of small drones can help to explore buildings, for example in order to search for survivors after an earthquake. The small size of the drones (around ~10 cm diameter) allows them to fly in narrow spaces and makes them very lightweight and safe. However, it also limits the amount of sensing and processing that the drones can carry onboard. Inspired by the intelligence of flying insects, we performed research in this project on the autonomous avoidance of obstacles, navigation in indoor spaces, and on the collaboration between different drones in the swarm. The swarm we developed, is able to explore unknown indoor environments. The drones carry a camera onboard for storing images, so that people can have a look at the images after the flight. Within the project, we have developed algorithms inspired by insect intelligence that now allow even very small drones to navigate by themselves in unknown environments. We have made the associated software open source, so that other researchers can reproduce our results, and so that developers can prepare our methods for real-world applications, which may range from monitoring crop in greenhouses to tracking products in warehouses.

Publications and other output:


https://pure.tudelft.nl/portal/files/33514398/IROS_pocketswarm_final_v2.pdf


https://arxiv.org/abs/1603.07644

http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7487496