

Drone for aerial cartography

1. Organisations involved in the project

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- This project is funded by the Galati IT&C Cluster, through the Tehnopol Association.
- Apart from the subject of our research, one of our goals is to provide young, talented and passionate high school students with the possibility of working in a high-profile, prestigious environment in the field of Informatics and Computer Science.
- Thus, training of specialists in this field of work that has a higher demand each year can start early in their lives, providing them with important educational insight. Moreover, it gets them used to the line of work in the industry and teaches them the importance of assuming responsibilities in such a project.

2. The aim of the project

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- In Galati, there are numerous agricultural fields of extraordinary economic importance.
- Airborne images of the fields, though rarely used currently, have the potential of easing the work of farmers and can provide them with information regarding the evolution of the crops through time that is hardly obtainable through other means.
- Thus, airborne surveillance, together with conventional methods (irrigation, usage of fertilizers and various anti-parasitic chemicals, etc) can help in increasing the quantities of fruits, vegetables and cereals gathered each year.

3. Project particularities

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- In airborne cartography, the most widely used vehicle is the winged drone (similar to a plane). They are engineered to fly at high speeds and altitudes. We chose a quadcopter for this particular application, for two reasons:
- -Thanks to the lower hovering altitude, images taken are clearer, the vehicle being closer to the Earth.
- -The lower movement speed is compensated by the increased freedom of movement compared to the wing, because sharp changes in direction can be caused in a matter of seconds. Thus, the drone's path can be optimised in order to achieve the best results.



- For choosing the best path, we developed a software specifically for the this project. It uses the vertexes of the area that is to be scanned, with their positions specified in latitude and longitude.
- After it finishes computing the path, it generates a file containing the waypoints in the format that is supported by Mission Planner.
- Afterwards, we import the waypoint file in Mission Planner and upload it on the drone's flight controller.

- During flight, the drone takes pictures of the field below at regular time intervals. After the flight finishes, these high resolution pictures are loaded in a high-performance computer that uses an advanced image compositing software in order to combine them in a single, extremely high-resolution map of the scanned area.
- Below, we present you with a couple of samples of the results of this software, using an online dataset.



