

FIT-4-NMP Networking and Brokerage Event

organized by FIT-4-NMP H2020 project at the 45th International Semiconductor Conference - CAS 2022

System of microtextured photovoltaic cells embedded into UAV wings with applications in societal security – Acronym: UAVPHOTO

Challenges and objectives

The strategic objective of the Project was to increase the flight autonomy of the UAVs with 30%. The market for UAVs now is highly diversified ranging from military applications to smart agriculture, goods and medicine delivery in remote locations, strategic infrastructure monitoring and recently to telecommunications relays for emergency situations.

All these applications are requesting extended flight autonomy as well as reliable technologies for UAVs manufacturing.



Technical goals

The project technical goals were:

- Design and produce small dimensions, highly efficient, micro-texturized photovoltaic cells capable to withstand the mechano-climatic challenges specific to a flying device (temperature, humidity, vibrations etc.).
- Develop a reliable technology for producing modular UAVs wings with photovoltaic cells embedded into their structure without increasing their weight.
- Develop the electronic module for integrating the photovoltaic matrix with the electronics onboard of the UAV.
- Fabricate an UAV equipped with the prototype of wings with embedded photovoltaic cells and flight test it in order to demonstrate the increased autonomy.
- There were previous attempts to manufacture UAV demonstrators with photovoltaic cells attached to their wings, however, in this project we were looking for the development of a technology capable to be implemented on a production line, and we followed all the necessary steps for such development, including extensive testing according to the aviation standards. The developed technology is ready to be transferred to the industry and the developed product was able to fly and fulfill the expected results.

Expected impact

The product chosen for this development was an electrically powered UAV from Hirus class which proved its reliability and maturity of development. The wings with embedded photovoltaic cells were developed as components which could replace the original wings in order to speed up the process of UAV development and could be delivered in a short time to the market. The outcome is significant since it could be expected that an additional 30% time of flight will be an asset attracting more clients and the company would be able to develop its business. To this moment two patent applications were issued and two articles were presented, one at CAS 2021 International Conference and one in an WOS indexed Journal.

Targeted topics and challenges

- Components, modules and systems integration
- Mobility (**challenge 2:** small drones)
- **Energy** (Major challenge 1: Smart and efficient – managing energy generation, conversion, and storage systems)

Contact details:

Name: Istrate Alin

Organisation: Autonomous Flight Technology

Email: alin.istrate@aft.ro

Telephone: +40740061073

Name: Octavian Ionescu (IMT)

Octavian.ionescu@imt.ro

Known partners:

- IMT Bucharest
- Autonomous Flight Technologies SRL

Needed profiles:

- <https://www.imt.ro/>
- <https://aft.ro/en/>

