

# NEWSLETTER

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BORDER  
UAS

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ISSUES 5 - 6

# EDITORIAL

**BorderUAS** has successfully started its second running phase from **June 2021** and for this period up until now has accomplished vital steps towards the development of BorderUAS solution. In specific, our technical partners led by TUC, implemented and evaluated all sensing devices. The multi-sensing framework of the solution was tested in its preliminary stage, employing four basic functions: **acquisition, storage, video streaming** and **object detection** (Perception).



The production of the **UAV** sub-systems are being completed by our technical colleagues from **HSF** and the processing infrastructure was set up by **VICOM**.



The second running phase closed with the implementation of the **2nd Progress Review Meeting**. The consortium members were organizing the meeting which took place online on **November 10th** and lasted all day.

The Commission, two external experts who were evaluating the work completed thus far and representatives from **FRONTEX** were actively participating and issued interesting questions and recommendations.



A result-based summary was used to convey all project successes over the review period, which ran from **June 2021** to **September 2022**.

# EVENTS

After twenty four months of work progress, the BorderUAS project organized and hosted the first physical plenary meeting between the 8th to the 10th of June 2022. The consortium members had the chance to meet in person for the first time in Zagreb, Croatia discussing on a rich agenda for two and half days.

## JUN 22 - PLENARY MEETING IN ZAGREB

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During the first day, the consortium focused more on the technical aspects of the project and the specific sensors that will be used for the final solutions of BorderUAS. Updates, status of progress, demonstration of some sensors and the future steps were presented by the leader partners of each component. The day concluded with a very interesting visit to Hipersfera's premises where the airship is being constructed. Thus the partners had the opportunity to see the work in progress and the first parts that have been developed so far (the cover materials , the skeleton of the airship, the propellers, and other custom made features).



During the second day, the conversations focused on overall approaches and progress of the project, some risks and challenges we have encountered and the way forward. Additionally, there was discussions covering the promotion of the project regarding the dissemination of the results and the exploitation steps of the BorderUAS solution. The second half of the day was covered by mini workshops on the ontology and use cases, the pilots' planning and execution and also the integration processes. These workshops proved to be really helpful and problem solving paving the way for the next steps of the project. A beautiful dinner at a traditional place in town of Zagreb was the best way to finish off a very productive day , where the partners managed to get to know each other better in a nice more personal and social atmosphere.



The last day, was dedicated to conclude on some decisions on the integration issues , and the data fusion that will be collected from all different sensors mounted on the airship. It was a great pleasure to meet all these people in person.

## JUN 22 - BORDERUAS ON CIPRE 2022

### [READ ONLINE](#)

Our Consortium partner SIMAVI presented BorderUAS on the CIPRE 2022 that took place in Bucharest from 14 – 16 June 2022. Critical Infrastructure Protection and Resilience Europe brought together leading stakeholders from industry, operators, agencies and governments to debate and collaborate on securing Europe's critical infrastructure. The unique two-track conference programme delivered a leading line up of international experts to discuss securing Europe's critical infrastructure and major venues, from both physical and cyber perspectives.

## JUL 22 - BORDERUAS ON EARTH FESTIVAL

### [READ ONLINE](#)

Our Consortium partner Technical University of Crete, presented BorderUAS on Earth Festival that took place in Crete in the west moat of Chania from 20 – 24 July 2022. The visitors had the opportunity to come up with state-of-the-art unmanned earth surface mapping systems, aerial space surveillance with applications in agriculture, fisheries and open fields. These exhibits had won global firsts in competitions such as Copernicus masters 2015, EU Satellite Navigation Competition 2016 etc.





# SEP 22 - EFFECTOR FINAL WORKSHOP

## READ ONLINE

The final workshop of the EFFECTOR project was successfully organized by the SGMer and IRIT in September 15th, in the city of Toulouse and BorderUAS project was invited to be there.

During this workshop representatives from the BorderUAS project had the opportunity to be part of the discussions about the results of the EFFECTOR project that focuses on situational awareness for Maritime surveillance. They also attended the demonstration of the final EFFECTOR solution.



This event was a great opportunity for BorderUAS to meet with delegates from FRONTEX, the French MRCC, and other practitioners and thus initiate a further engagement with them through a future invitation in the BorderUAS pilots. BorderUAS is establishing an end-user's ecosystem that will be highly welcomed during the project's pilot workshops.

During the last part of the workshop in Toulouse, BorderUAS representatives were involved in a workshop session where all participants were divided in small groups addressing questions regarding the current status of end-users capability gaps, how to overcome their challenges and finally share recommendations for future uptakes and new innovative solutions.

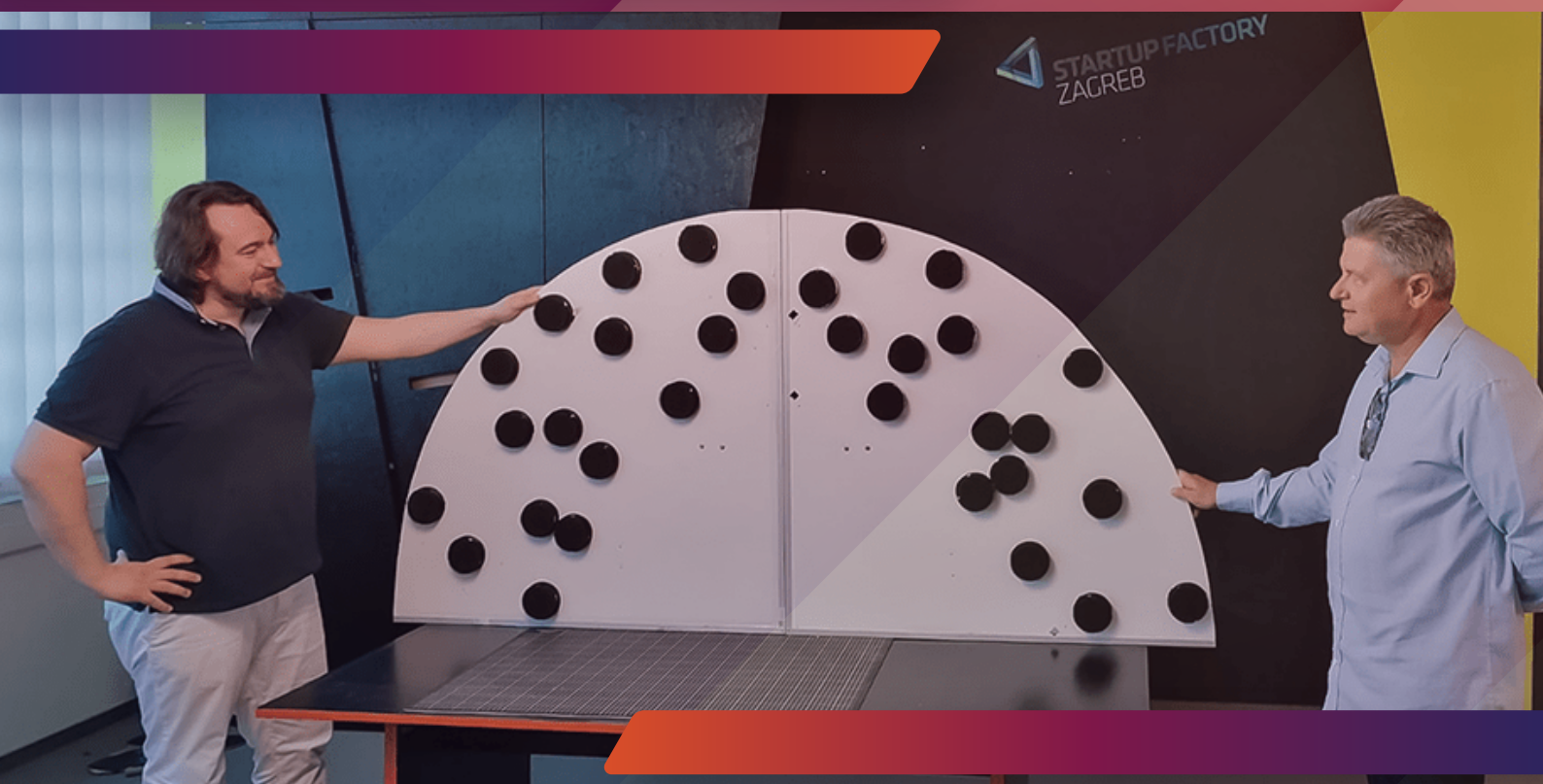
We thank the organizers of EFFECTOR conference for the invitation to this interesting final event and for the collaboration with BorderUAS, especially on knowledge sharing on CISE ontologies.

# OCT 22 - TECHNICAL WORKSHOP IN ZAGREB

## READ ONLINE

During the period 6 to 9 September 2022 the BorderUAS partners have organized a technical workshop for the integration of the multiple sensors on the premises of our Consortium Partner HSF, in Zagreb, Croatia.

The workshop allowed to get coherent data with different sensors in the same environment for the first time. The gathered results are enabling the future activities such as sensors calibration and primary processing for preparing data fusion processing.



In conclusion, after the end of this workshop we are very satisfied with the progress of the project so far. We pave the way for further progress and share the results with our stakeholders.



# NOV 22 - 2<sup>ND</sup> REVIEW MEETING

## READ ONLINE

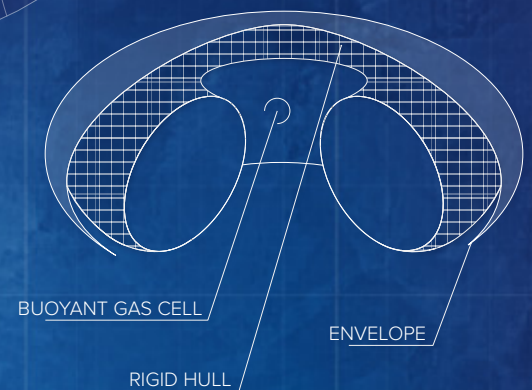
This autumn, the BorderUAS project accomplished another important milestone. The 2nd Progress Review Meeting was held on November 10th online and lasted for a full day. The meeting was attended by the Commission, two external experts who were evaluating the work completed so far, representatives from FRONTEX and representatives of all 17 consortium partners.

The period under review was from June 2021 through September 2022 and all project accomplishments were presented using a result-based summary. The promotional video, an hour-long live and video demonstrations section, and informative presentations related to the work progress, challenges and achievements were featured during this online meeting to enable the Commission and the experts to better understand the advancements of BorderUAS. The Consortium partners had the chance to discuss, clarify and resolve issues, and at the same time to communicate all new results to all partners involved.



The general feedback from both the Commission and the experts was really positive and encouraging for the continuation of the project. Although a lot of work still needs to be carried out, the reviewers emphasized the excellent work completed thus far and recognizing the project's potential and dynamics. In order to accomplish the desired outcome, the consortium partners are committed to keep up with the hard work and reach all milestones of BorderUAS project.

# THE RISE OF AUTONOMOUS SPECIAL PURPOSE AIRSHIPS



Airships are defined as “lighter-than-air” aircrafts that produce lift thanks to the buoyancy of their lifting gas (helium or hydrogen) instead of the force produced by air flowing over surfaces such as wings or blades. This means that airships do not require engine power to stay afloat, unlike airplanes or helicopters. Airships are generally divided into three categories: non-rigid (also called blimps) that sustain their shape by a pressure differential between the internal lifting gas and the outside atmosphere; semi-rigid that contain an aerodynamically shaped rigid keel to provide support for the overall non-rigid envelope; and rigid airships that maintain their envelope shape thanks to a rigid framework and not by its internal pressure.

The history of modern airship designs is actually older than the engineering of modern airplanes. In 1900 Count Ferdinand von Zeppelin performed the first successful experimental flight of his rigid LZ-1 airship. The airship was 128 m long, 11.7 m in diameter, and its 11,298 m<sup>3</sup> of volume filled with hydrogen produced 12,428 kg of lift. Although the history of airships can be traced back to the end of 18th century, jointly with the development of balloons, the first Zeppelins can be considered as the beginning of advanced airship aeronautics. For the first time they introduced some advanced techniques needed to overcome major issues with the mooring and ground handling, resistance to wind gusts, safe landing and attaching to the mooring station, weight balancing, lift control, manoeuvrability, etc. All these issues are still relevant even today in the design of airships.

By 1930s airships entered a massive military and civilian usage, with regular flights of luxury airships across the Atlantic Ocean. They were seen as the future of air travel and the technology that will dominate the sky. However, airplane technology



had been advancing very fast at that time and airships were losing the race for the most efficient method of aerial transportation of cargo and passengers, where the economic driver is the specific power spent by the vehicle (maximum engine output power per gross vehicle weight per maximum speed) for a given maximum speed of travel.

Then in May 1937 the large airship LZ-129 Hindenburg exploded during the landing procedure in Lakehurst, New Jersey, which killed 36 people. This event became a global news thanks to the popular radio broadcasting at that time. Even though this was not the largest airship tragedy, it played a major role in turning the public opinion against airships. Even today, one of the first associations to the word “airships” is the Hindenburg disaster, even though today’s safety regulations and materials used in airships dramatically reduce the risk of fire.

Since then, the airships have almost disappeared from the sky, while airplanes and helicopters dominate the aviation industry. Only a small number of blimps have been in a limited commercial or military use for surveillance and entertainment. This is in a stark contrast to the Hindenburg-class airships that remain the largest flying vehicles ever. With their 245 m in length and 41 m in diameter, Hindenburgs produced about 230 tonnes of useful lift that covered large gondolas, fuel, equipment, various cargo, about 90 passengers and luxury goods.

Although interest for airship development has never disappeared, it has increased within the last two decades. Modern versions of Zeppelins are now used for touristic flights, but the main driver for new developments came from the desire of U.S. military to explore new solutions for reconnaissance flight vehicles or transport of large and heavy cargo to world areas of limited or non-existent ground infrastructure. This was further enhanced by the civilian needs for environmentally friendly and sustainable ways of transport. The underlying rationale was that advancements in materials, engines, electronics, autonomous systems, and other relevant aeronautical technologies would enable breakthroughs in airship design and development.

At the same time, airships are still an obscure field of aeronautics, lacking rapid sizing methods that could enable simple early estimates of physical specifications of unconventional designs of airships. This resulted in a proliferation of unrealistic ideas and designs that are aesthetically appealing, but unsustainable (either from the engineering or business perspective) when used in real environments.

[Read here the full article](#)



# PRIVACY LAW IMPLICATIONS OF UNMANNED AERIAL SURVEILLANCE

There is no denying that the need to safeguard all individuals' life, rights and interests is at an all-time high, particularly as the ability to cause harm through technical means has only grown as technology advances. That said, Law Enforcement Agencies ("LEAs") also benefit from technological advancement, and alongside dedicated engineers, developers and other experts within the field, can use technology advancements to enhance the protection of human rights as long as the right balance is struck between safeguarding societal interests and the rights of the individual. This is no easy task to achieve.

One such example which seeks to confront this challenge is the recent developments in Unmanned Aerial Vehicle ("UAV") technologies. These lightweight devices come with myriad opportunities, both for personal and enforcement purposes. The BorderUAS project (the "Project") has zoned-in on the advantages which UAV technology can bring about for LEAs and other public authorities, in a bid to provide a holistic UAV surveillance approach integrating aerial and ground components using next generation sensors and technologies and developing a consistent platform used for daily border operations.

[Read here the full article](#)





## NEXT STEPS

## UPCOMING EVENTS

- The qualification test flights of the UAV are progressively providing information on the behaviour of the system in various conditions and with different configurations.
- The second technical workshop will be focusing on the integration of the multi-sensing framework and ground processing of the data acquired.
- The planning of the pilot testing will be prepared with details and adaptations are made based on the specific site conditions.

If you are interested in our progress and developments, stay tuned through our various dissemination channels and the frequent blogposts that are available through our [website](#).

# CONTACT



@borderuas



#borderuas



@borderuas



<https://borderuas.eu/>



[info@borderuas.eu](mailto:info@borderuas.eu)



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