AVIATION
TWIN TRANSITION
CLUSTER

Clustering Event

29-30 July, 2025

Athens, Greece

Funded by
the European Union

ABOUT

RefMap aims to reduce the environmental impact of air travel for airlines and Unmanned Aerial Systems by creating a digital service that optimises flight trajectories on both micro and macro levels. By using environmental data, such as wind, noise, CO2 and non-CO2 emissions, RefMap's analytics platform can help airlines make more eco-friendly decisions. This will lead to stricter evidence-based Green policy making in the aviation sector and the development of new aviation business models in line with the EU's Green Agenda.

OBJECTIVES

RefMap develops a fuel-based air quality model that accounts for both conventional fossil fuels and sustainable aviation fuels. This model captures primary and secondary pollutants in both polluted and cleaner areas, combining climate impact and aircraft noise modules for trajectory optimisation. REFMAP develops the above solutions to achieve the following objectives:

- Trajectory Optimisation
- Flow Patterns Prediction
- Reduce air travel's environmental impact
- Minimise the noise impact on communities and wildlife
- New aviation business models

USE CASES

RefMap use cases fall into two different categories, large scale and small scale. Large scale use cases focus on sustainability and aviation regulations for airlines and airports on an EU level, while small scale use cases focus on urban air mobility and the integration of drones to daily activities.

CONSORTIUM

Led by a multidisciplinary consortium of 11 partners from 8 European countries, REFMAP brings together researchers, policymakers, engineers, and user communities to co-design actionable solutions.

A European initiative for a sustainable future

The Aviation Twin Transition Cluster aims to leverage synergies with other EU initiatives to create European digital platforms that provide insights and analytics for citizens, businesses, and policymakers.

Funded by the European Commission, members of the Aviation Twin Transition Cluster are working to develop and demonstrate new technologies that further digitalise and automate the European aviation sector. Our vision is to make aviation greener, more circular, and globally competitive.

OUR GOALS

- To enable new European business models and products with minimal environmental impact and opportunities for European competitiveness.
- To transform digital aviation and space technologies as well as Unmanned Aircraft Systems (UAS).
- To enable new services with pronounced societal impact for intermodal and multimodal transport, search and rescue operations, fast response to natural disasters, freight, firefighting, high altitude earth data-services, agriculture and forestry.
- To leverage new aviation products and services that exploit Artificial Intelligence and have pronounced impact to productivity, efficiency, automation and cost reduction.
- To minimise the risks risks posed by emerging threats to aviation such as cybersecurity, COVID-19, extreme weather conditions (e.g. temperature change, wind patterns).
- To leverage technologies that address applications in difficult to access areas, including the open sea emergency response, avalanches, landslides and floods are within the scope of the topic.
- To exploit synergies with aviation, space and defence.

OUR MISSION

- To act as a hub for information exchange and training
- To promote networking among its members and strengthen idea exchange by developing best practices
- To engage in communication campaign aiming at raising awareness on research outcomes that can make aviation greener and more digital
- To serve as a conduit to requisite expertise or relevant projects, whether at the national, European, or international level.

LEARN MORE

Participating projects

ImAFUSA explores factors affecting public acceptance of Urban Air Mobility (UAM). The project aims to create a framework that will facilitate the socially acceptable and beneficial deployment of UAM in cities.

imafusa-sesar.eu

ICOLOSSUS will develop a system-of-systems design methodology which for the first time will enable the combined optimization of aircraft, operations and business models. Resulting specific solutions for intermodal transport and wildfire-fighting as well as developed methods and tools will be openly published in order to foster exploitation for research and industry.

colossus-sos-project.eu

AIRSHIP is a Horizon Europe funded project (GA 101096487) that envisions an innovative use of a known transportation mean: flying ships. Such vehicles (also known as ekranoplans or wing-in-ground -WIG vehicles) inherit all the advantages of conventional airborne transportation, while being more energy efficient and environmentally friendly, both from the carbon footprint and the acoustic noise pollution point of view. AIRSHIP aims to lay the foundations of a new class of fully electrical unmanned aircraft system, the UWV (Unmanned WIG Vehicle) that brings together speed, flexibility and energy efficiency.

airshipproject.eu

Participating projects

Di-Pegasus

Di-PEGASUS aims to develop several enabling technologies targeting both the air and the ground side, in order to enable fully autonomous, cost-effective and environmentally friendly operations for seaplanes, VTOL and drones.
Integrating AI and automation in the transport sector is essential to optimize routes, reduce emissions, and enhance fleet management. To facilitate this integration, the Di-PEGASUS platform is proposed as a comprehensive tool to assess the viability of business models, considering key performance indicators and regulatory compliance. This platform is seen as a critical component in the development and exploitation of innovative technologies, providing a framework to evaluate societal and economic impacts and assisting stakeholders in making informed decisions throughout the entire development process.

research.dblue.it/di-pegasus/

Clustering Event Agenda

Opening Speeches

- **Anna Palaiologk**, Future Needs Management Consulting, Event Organiser
- **Gerardo Zampino**, KTH Royal Institute of Technology, RefMap Project Manager
- **Georgios Bampanis**, CINEA / European Commission, Project Officer

Keynote Speeches

- **Ioanna Katsarou**, Ioanna Katsarou, Policy Officer at European Commission, DG MOVE
- **Ignacio García Vega**, IGAVE INNOVATION, Flying Forward 2020

Panel Discussion #1
Showcasing Digital Leadership

- **Sotiris Xydis** (ICCS Institute of Communication and Computer Systems NTUA, RefMap project)
- **Fateme Baneshi** (UC3M Carlos III University of Madrid, RefMap project)
- **Milan Rollo** (AgentFly, ImAFUSA)
- **Prajwal Prakasha** (DLR German Aerospace Center, Colossus project)

Panel Discussion #2
Future Aviation Economy

- **Anna Palaiologk** (Future Needs, RefMap project)
- **Sofia Kalakou** (ISCTE - Instituto Universitário de Lisboa, RefMap project)
- **Kyriaki Daskaloudi** (Future Needs, ImAFUSA project)

Clustering Event Agenda

- **Petros Masouridis** (WaltR)
- **Stefan Kaufmann** (TransHyDE 2.0)

Panel Discussion #3
Sustainability challenges in Aviation

- **Antonio Torija Martinez** (University of Salford, RefMap project)
- **Abolfazl Simorgh** (UC3M Carlos III University of Madrid, RefMap project)
- **Gerardo Zampino** (KTH Royal Institute of Technology, RefMap)
- **Angelos Filipatos** (Department of Mechanical Engineering & Aeronautics, University of Patras)
- **Constantin Tzembelicos** (Element Aerospace Limited, Di-Pegasus project)

Panel Discussion #4
Regulatory and Operational Challenges

- **Basimakopoulou Marina** (Hellenic Civil Aviation Authority)
- **Sofia Kalakou** (ISCTE - Instituto Universitário de Lisboa, ImAFUSA project)
- **Raffaello Mariani** (KTH Royal Institute of Technology, ImAFUSA project)
- **Zorana Milosevic** (Universidad Politécnica de Madrid, Airship project)
- **Ioanna Moscholidou** (University of the Aegean, Di-Pegasus project)

Anna Palaiologk

Founder of Future Needs,
RefMap, ImAFUSA

About

Anna Palaiologk is the Founder of Future Needs, an EU Proposal Writer and a Researcher in Spatial, Transport and Environmental Economics. In her 19 year career she has authored more than 50 proposals and worked in more than 30 projects. She is experienced in managing large teams, in policy assessment methodologies, as well as business model innovation and participatory actions. Anna has a deep understanding of the European digital market and a broad knowledge of the ICT value chain.

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What do users want from tools addressing sustainability in aviation and UAM?

In this session, we present the results of what the market expects from innovative tools aiming to make the aviation and drone industries sustainable. A massive pool of senior stakeholders and potential users has been interviewed under activities of the Horizon Europe project RefMap. Users rated features and functionalities they prioritise in a platform aimed at emissions reduction, noise mitigation, air quality improvement, and optimisation of flight trajectories.

Participants of this session will gain an in-depth understanding of which operational and environmental performance goals users prioritise. To enhance participants' engagement in the session, they will be invited to rate certain features themselves via a live poll during the session.

Participants will also be presented with visual simulations of use of the most popular features of the platform and be invited to check out the rest of the features at the booth of the project at the expo.

Emphasising a user-centred and stakeholder-driven approach, the session will offer practical insights into aligning technological innovation with market needs, regulatory requirements, and sustainability objectives. Attendees will explore how collaborative design processes can accelerate the adoption of sustainable technologies and contribute to a more efficient, environmentally responsible aviation ecosystem. To increase data transparency and results credibility, participants will be informed of the methods used to gather and analyse stakeholder input.

This session is designed for industry professionals, policymakers, researchers and innovators involved in sustainable aviation, urban air mobility, and environmental technology development.

Gerardo Zampino

PostDoc at KTH Royal Institute of Technology, RefMap

About

Dr Gerardo Zampino holds both bachelor's and master's degrees in Aerospace Engineering from the Polytechnic University of Turin. He completed his PhD at the University of Southampton, where his research focused on the mathematical modelling of heterogeneous rough surfaces. Currently, he is a postdoctoral researcher at KTH Royal Institute of Technology in Sweden, where he works at the intersection of advanced modelling and sustainable mobility. Dr Zampino also serves as Project Manager of the Horizon Europe project RefMap, which aims to support the decarbonisation of aviation through innovative noise and emissions mitigation strategies. His research interests span surface modelling, aeroacoustics, and environmental impact reduction in transport systems.

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How does the turbulence affect the drone trajectory?

The overall aim of RefMap is to promote a new approach for a greener aviation using AI for the trajectory optimisation. Although RefMap focuses on both commercial aircrafts and UAVs, only the latter cases are presented. The neural network with Deep Reinforcement Learning (DRL) is employed to track and choose the drone trajectory in a simplified urban environment simulated using the high-fidelity LES. Here we follow the entire development from the setup of the simulations used to identify and physically understand the motivations behind the setup of the DRL. The analysis of the turbulent structures around the buildings, here modelled as wall-mounted, square cylinders shows that the most hazardous region for a drone corresponds to the detached-flow region that envelops the rear obstacle. This region also displays the highest stress gradient for which the NN has been trained to avoid. The navigation of the drone in the 2D slice is a significant example of the potentiality of this tool as, in real time, as the path proposed avoids the hazardous region until to reach the target.

Georgios Bampanis

Project Officer, CINEA / European Commission

About

Georgios Bampanis is an acoustician with a Master's in Computational Mechanics and broad expertise in experimental techniques related to noise, vibration, and flow measurements. He has extensive experience applying research skills to complex industrial engineering challenges, particularly in innovative design, complex flow analysis, and data-driven R&D for competitive product development. His background spans aeroacoustics, fixed-wing and drone noise, noise reduction strategies, CFD, FEM, CAE, smart materials, optimisation, programming, and data analysis. Georgios brings strong analytical skills, systematic thinking, and project management expertise. He is passionate about problem-solving and conceptual development, consistently aiming to devise creative yet practical solutions. His leadership strengths include clear team communication, motivation, and upholding high productivity and quality standards.

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CINEA, the European Climate, Infrastructure and Environment Executive Agency

The European Climate, Infrastructure and Environment Executive Agency (CINEA), established by the European Commission with a budget of around €56 billion for 2021–2027, supports the European Green Deal by implementing EU programs that contribute to Europe's transition to climate neutrality by 2050.

The agency supports vital transport and energy infrastructure actions under the Connecting Europe Facility program. Under the Horizon Europe program, it also implements research and innovation projects aimed at fostering climate action, improving the competitiveness of the energy and transport sectors, and enhancing the quality of the services they provide to society.

CINEA also manages the implementation of the Innovation Fund, one of the world's largest funding programs for the commercial demonstration of innovative low-carbon technologies.

Additionally, the agency implements the Renewable Energy Financing Mechanism, which helps Member States reach their renewable energy targets, and the Public Sector Loan Facility, a pillar of the Just Transition Mechanism, which supports the regions most affected by the transition towards climate neutrality.

CINEA also advances environmental protection, nature conservation, climate action, and clean energy projects through its implementation of the LIFE Programme. It is also responsible for the European Maritime, Fisheries and Aquaculture Fund, which supports the Common Fisheries Policy, the Union's Maritime Policy, and the EU's agenda for international ocean governance.

With its focus on climate, the environment, modern infrastructure, and networks, CINEA is the EU's focal point for green projects in Europe.

Ioanna Katsarou

Policy Officer at European Commission, DG MOVE

About

Ioanna holds a Bachelor's degree in European Economics from Athens University of Economics and Business and a Master's in Economics of Markets and Organisations from the Toulouse School of Economics. She has worked with UNHCR and Airbus, and since 2012 has been with EUROCONTROL, contributing to the Single European Sky Performance Scheme, budgeting, and SESAR Programme cost-benefit analysis. Since March 2022, she has been seconded to the European Commission as a Policy Officer at DG MOVE, initially in Aviation Policy (MOVE E1), focusing on sustainable finance, airport electrification, aviation taxation, and high-level stakeholder engagement. In 2025, she joined the Single European Sky Unit (MOVE E3), continuing her work on SESAR. She is fluent in Greek, English, and French.

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EU Policy for a sector in transition

This keynote speech will outline European Union's strategic for aviation,focusing on ATM, sustainability, competitiveness, and innovation. Recent challenges, such as pandemic disruptions, airspace limitations due to geopolitical tensions, and environmental concerns, highlight the urgent need for reform in European air traffic management.

The Single European Sky 2+ (SES2+) regulation marks a new era for European air navigation, promoting streamlined, sustainable practices through technology. It aims to boost operational efficiency and integrate drone services.
Technological advancement is key, with initiatives like the SESAR project spearheading progress in air traffic management. The European Commission is urging stakeholders to engage in research and development to drive digital and automated solutions for the future.

Sustainable Aviation Fuels (SAF) are central to our environmental strategy, as outlined in the ReFuelEU Aviation, aiming for increased SAF uptake to support Europe's energy diversification and economic growth. Sustainable Transport Investment Plan (STIP) will address barriers to boost eSAF production, creating leadership opportunities.

The European Commission is committed to maintaining global aviation leadership by fostering modernization and sustainability. Collaboration and innovation will enhance Europe's connectivity and competitiveness, aligning with our 2050 climate neutrality goals.

Ignacio Garcia Vega

IGAVE Innovations, Flying Forward 2020

About

Ignacio García Vega is a Telecommunication Engineer specialising in industrial organisation and innovation management. He drives impactful change in the ICT sector through European and national R&D&I projects, supporting organisations—from SMEs and universities to hospitals and cities—in securing strategic funding and bringing innovative solutions to market. He has deep experience across the full R&D lifecycle and has led over 60 projects across programmes such as Digital Europe, Horizon Europe, and H2020. Currently, he coordinates the Online Procurement Helpdesk and Local Digital Twins initiatives, promoting citizen-centric smart cities. Ignacio is also active in the European DataSpace for Smart Communities and serves as an EU project evaluator and mentor for tech startups.

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Local Digital Twins: The aerial advantage for sustainable urban futures

The European Union's strong commitment to Net Zero Cities is inherently linked with the advancement of Local Digital Twins. This presentation will explore the synergistic relationship between these initiatives, focusing on two key opportunities for the aviation sector, particularly with the integration of Uncrewed Aircraft Systems (UAS).

Firstly, we'll establish UAS as an indispensable data engine for Local Digital Twins. Drones are vital for generating highly accurate 3D representations of urban and peri-urban environments and provide continuous, real-time data monitoring through advanced sensors. This expanded role represents a significant market opportunity for increasing drone utilization by public administrations, enabling comprehensive spatial and environmental data input crucial for sustainable urban planning and infrastructure management. This data also facilitates the integration of various transport modes within the digital twin, allowing for holistic urban analysis.

Secondly, Local Digital Twins empower public authorities to make evidence-based decisions through sophisticated simulations. These digital environments can be utilized to model and optimize future urban services, including those that might leverage advanced aerial operations. Simulations can assess environmental impacts, optimize operational efficiencies, and support regulatory compliance, aiding in the strategic planning and potential procurement of innovative urban solutions. The H2020 Flying Forward 2020 (FF2020) project directly demonstrated the practical application of drones for 3D digital twin representation and the simulation of regulatory compliance. Furthermore, recognizing procurement as a complex step for public administrations, insights from FF2020 on streamlining these processes will be referenced.

This presentation directly addresses the ATT Athens Clustering Event by showcasing "digital leadership in aviation" through tangible applications that support Net Zero Cities initiatives. It offers clear

Ignacio Garcia Vega

Local Digital Twins: The aerial advantage for sustainable urban futures

pathways to navigate "regulatory challenges and/or opportunities in digitising and greening aviation", with a specific highlight on the contribution of drone technology to greener urban environments.

Main messages:

- UAS are essential data engines for Local Digital Twins, a key enabler for achieving Net Zero Cities.
- Local Digital Twins empower evidence-based decision-making and streamline public sector procurement for sustainable urban development and transport.

Sotiris Xydis

Assistant Professor at ICCS - National Technical University of Athens,
RefMap, ImAFUSA

About

Sotirios Xydis is an Assistant Professor at the School of Electrical and Computer Engineering of the National Technical University of Athens (NTUA), where he also earned his Diploma (2005), Master's in Techno-Economic Systems (2011), and PhD (2011). His research focuses on hardware/software co-design optimization with emphasis on HPC and cloud computing systems. He has held research positions at Politecnico di Milano and ICCS, and previously served as faculty at Harokopio University of Athens and as chief engineer at HEDNO (Greek DSO). Dr. Xydis has contributed to over 15 national and EU R&D projects, authored 120+ publications with 2000+ citations, and has received multiple best paper and HiPEAC awards.

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RefMAP Platform Demonstration

This presentation introduces RefMap Multi-scale Analytic Platform a unified and cloud-enabled platform for large scale and small scale sustainable aviation planning analytics. The discussion will be focused on the main features and analytic tools supported by the platform at its current state, its technology stack and its its scalable and portable architecture and design principles tailored for future air mobility needs.

Fateme Baneshi

Doctoral Student at University Carlos III of Madrid (UC3M), RefMap

About

Fateme Baneshi is a Ph.D. candidate in the Department of Aerospace Engineering at Universidad Carlos III de Madrid, Spain. She obtained her B.Sc. and M.Sc. degrees in Control Engineering in 2018 and 2021, respectively, graduating as the first-ranked student in both programs. Her research focuses on aircraft trajectory optimization, reinforcement learning, climate change, ATM research, and control theory and applications. Fateme has contributed to European research projects such as RefMAP. Throughout her academic career, she has presented her work at numerous national and international conferences and published six articles in reputable, high-impact journals. Her excellence has been recognized through several prestigious awards, notably the Luis Azcárraga Aeronautical Innovation Award in 2023 and the Best Paper Award at the International Conference on Research in Air Transportation (ICRAT 2022).

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Aircraft Trajectory Planning for Climate Impact Mitigation Considering Air Traffic Complexity: A Constrained Multi-Agent Reinforcement Learning Approach

Aviation contributes to human-induced climate change through the emission of carbon dioxide (CO2) and other non-CO2 forcing agents. The latter, responsible for roughly two-thirds of aviation's climate effects, is highly sensitive to the time and location of emissions. Consequently, climate-aware flight planning emerges as a potential measure to mitigate its associated climate impacts. However, optimizing individual flight trajectories to reroute regions with high climate impact leads to traffic redistribution; sectors associated with warming effects tend to experience reduced traffic flow, while adjacent areas often face increased traffic density. This redistribution can introduce challenges to the manageability of the traffic, potentially raising concerns about the feasibility of such routing strategies.

This work presents a fast-time, scalable framework built on constrained multi-agent reinforcement learning to plan operationally feasible climate-friendly routes from the perspective of the air traffic management system. To mitigate climate impact, we identify specific airspace regions where aircraft emissions have significant warming effects, referred to as climate hotspot areas, and incorporate them as constraints that aircraft should avoid. To ensure operational feasibility of trajectories, traffic complexity is considered as the objective function to be minimized. Starting from business-as-usual trajectories, each aircraft adjusts its flight path to avoid climate hotspot areas while minimizing the overall air traffic complexity. The proposed method employs the multi-agent proximal policy optimization algorithm and adapts it to handle constraints related to climate hotspot avoidance using the Lagrangian technique. To ensure scalability, parameter sharing is employed, allowing the algorithm to deal with varying numbers of concurrently operating aircraft in different scenarios.

Fateme Baneshi

Aircraft Trajectory Planning for Climate Impact Mitigation Considering Air Traffic Complexity: A Constrained Multi-Agent Reinforcement Learning Approach

The effectiveness of the proposed framework is validated through an experiment using real traffic data within European airspace on December 20, 2018, encompassing all the flights operating between 12:00 UTC and 16:00 UTC. The results demonstrated that the proposed approach balances environmental objectives with air traffic manageability, achieving a 9.14% reduction in net climate effect and a 5.27% decrease in traffic complexity, with a 0.64% increase in operational cost compared to business-as-usual trajectories.

Milan Rollo

CTO at AgentFly Technologies,
RefMap, ImAFUSA

About

Dr Milan Rollo is CTO at AgentFly Technologies, where he leads the unmanned systems division and serves as chief architect of the AgentFly system architecture. He holds an MSc in Technical Cybernetics and a PhD in Artificial Intelligence and Biocybernetics. His work focuses on robotics, unmanned systems, distributed agent-based simulations, team action planning, resource allocation, and communication management. He has led numerous research projects funded by industry, national programmes, and EU and US defence agencies. Dr Rollo has contributed to EUROCAE WG-105 and NATO NIAG SG-205 on UAS integration. He has authored over 30 scientific papers and serves on programme and organising committees for several international conferences.

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Modelling and simulation of drone traffic public acceptance criteria

Drone traffic brings novel challenges to urban planning and environmental impact assessment. Manned traffic has developed for over 100 years, and its impact on the public is well-studied. On the other hand, drones represent a new paradigm, and their range of operation will exceed that of manned aviation, including last-mile delivery. Currently, we lack tools that allow us to study the impact of drone traffic on the public on a large scale. In this talk, we will demonstrate the use of fast-time, large-scale simulations to evaluate the public acceptance of drone traffic in terms of noise annoyance, visual pollution, and safety perception. Scenarios for selected real-world areas will be presented, comparing various air traffic densities and organizations and evaluating its impact.

Milan Rollo

Prajwal Prakasha

Leader at Aviation System Design and Assessment - Institute of Systems Architectures in Aeronautics, German Aerospace Center (DLR), Colossus

About

Prajwal leads Aviation System Design and Assessment (Panda Works) at the Institute of Systems Architectures in Aeronautics of the German Aerospace Center (DLR) with an objective to learn and leverage a System of Systems approach to address critical aviation challenges collaboratively. At DLR, Prajwal coordinates several EU and international projects such as EU Impact Monitor 1, 2, the COLOSSUS project focusing on aerial wildfire fighting & intermodal mobility, Clean Aviation CLAIM Projects, German ALICIA projects and other system of systems projects. With 15 years of professional experience across India, the United States, and Germany and being a Committee Member of ICAS, IFAR, AIAA, DGLR, AeSI societies, Prajwal embraces learning collaboratively with global perspectives to tackle aviation problems.

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Colossus Project Results

COLOSSUS is a Collaborative System of Systems Exploration project to design Aviation Products considering Business Models . The project developed a system-of-systems design methodology which will enable the combined optimization of aircraft, operations and business models. Resulting specific solutions for intermodal transport and wildfire-fighting as well as developed methods and tools will be openly published in order to foster exploitation for research and industry.

To develop Seaplanes and E-VTOLs, this holistic 4-level approach spans the Business Models, System of Systems, Constituent Systems and Subsystems while capturing the complex interactions and interdependencies between the levels to extend the usual design and product development processes.

Sofia Kalakou

Professor at ISCTE University Institute of Lisbon, ImAFUSA (Coord.), RefMap

About

Sofia Kalakou is an Assistant Professor in ISCTE´s Department of Marketing, Operations and General Management, researcher of BRU-ISCTE's Management Research Group and Director of the Post-Graduate program "Future Mobility" for Executives. She is the global coordinator of the ImAFUSA project and ISCTE´s coordinator for the Refmap and SmartVitiNet projects. She holds a PhD and MSc in Transportation Systems, and a BSc in Civil Engineering. Her research focuses on air and urban transport planning and management, social aspects of transport, identification of citizen needs in the context of mobility, urban development through changes in transport systems, technology adoption and integration in operations, impact assessment and operations performance assessment. Before joining ISCTE she worked as a consultant in the transport and mobility sector.

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Business insights for the pathway of future sustainable aviation

IAM operations performance assessment

Innovative Air Mobility (IAM) is expected to transform how people and goods move, particularly in urban and regional settings, by introducing new, sustainable, and efficient air transportation solutions. To smoothly integrate it into city systems and inhabited areas, it is imperative to measure its expected performance and how this will impact the ecosystem. Changes are expected to be seen both internally in the system of aviation and how it operates and externally, in the society and the business sector, where citizens and companies may experience the positive or negative impact of IAM´s advent. Hence, both internal and external aspects need to be considered. It is observed that the internal aspects are more broadly assessed in the literature compared to the external. They often express how the capacity of the system will be impacted. On the other hand the external aspects, such as societal and economic consequences are still to be developed. Overall, the performance of Innovative Air Mobility (IAM) can be measured through a combination of technical, operational, environmental, and societal indicators.

Kyriaki Daskaloudi

Project Manager at Future Needs,
ImAFUSA, RefMap

About

Kyriaki Daskaloudi is an Innovation Project Manager & Researcher at Future Needs, with a background in Organisation Management, Project Management, Finance and Mathematics. In Future Needs she has been working on EU Research projects related to transportation. Her studies were in Mathematics at the Aristotle University of Thessaloniki (AUTH), specialising in applied mathematics.

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Evaluating accessibility and welfare in Urban Air Mobility Integration

How can cities evaluate the impact of Innovative Air Mobility (IAM) on people's lives? This presentation introduces two decision-support tools developed by Future Needs in the context of the SESAR 3 JU-funded ImAFUSA project: an Accessibility Tool and a Welfare Impact Tool, designed to help urban and transport planners assess the spatial and socioeconomic implications of IAM integration. The Accessibility Tool focuses on two key indicators showing how access to IAM hubs varies across the urban area and revealing spatial mismatches between where people live and where jobs are located. These indicators help identify underserved zones and demonstrate the potential of IAM to improve access equity. The Welfare Tool models how IAM affects broader economic conditions using two indicators capturing how proximity to IAM infrastructure might influence property values and reflecting productivity gains linked to increased connectivity. These indicators are grounded in urban economic theory and support scenario-based planning. The development of these tools builds on recent research extending the SUAMI framework for sustainable IAM assessment by integrating selected indicators from the SUMI framework. While this research provides the conceptual foundation, the presentation focuses on how these insights are applied in practice to create actionable tools for decision-makers.

Kyriaki Daskaloudi

Petros Masouridis

Head of Business development
Europe, WaltR

About

Petros Masouridis is a Business Development and Project Manager with a Master's in Economics and Agricultural Economics, and over 12 years of experience in management and business development. Based in Berlin, he initially joined WaltR as a consultancy contractor to support international expansion beyond France. Following a successful collaboration, he became a core member of the team. Petros brings a multidisciplinary background and extensive experience working with European institutions, NGOs, public authorities, and governmental organisations. His civic engagement and cross-sector expertise enrich WaltR's strategic direction, particularly in navigating complex stakeholder environments and fostering impactful innovation across Europe.

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APU usage monitoring through AI to reduce emissions and costs

WaltR is collaborating with Group ADP to pioneer a groundbreaking solution for air quality and CO2 management at Paris-Charles de Gaulle Airport. Leveraging advanced multi-optical technology combined with Iand real-time data transmission, WaltR's system automatically detects APU usage and monitors aircraft emissions, delivering critical insights to reduce environmental impact. By integrating with ADP's data infrastructure, this partnership aims to enhance air quality management and optimize energy consumption, fostering a more sustainable airport operation.With WaltR's innovative approach, airports are setting new standards in environmental responsibility and operational efficiency, reinforcing commitments to sustainability and innovation in airport management.

Stefan Kaufmann

Chairman, TransHyDE 2.0 association

About

Dr Stefan Kaufmann served as the German Ministry of Education and Research's Innovation Commissioner for Green Hydrogen (2020–2022), contributing to Germany's national hydrogen strategy and advising the National Hydrogen Council. Since 2022, he has worked as a Senior Adviser on hydrogen strategy for organisations including thyssenkrupp, Horvath, Drees & Sommer, World Energy GH2, Turn2X, and the Green Hydrogen Organization. In 2025, he was elected Chair of the TransHyDE 2.0 association. A fully qualified lawyer and former member of the Bundestag (2009–2021), he returned from January 2024 to March 2025 as successor to the late Dr Wolfgang Schäuble. He previously chaired the Study Commission on Vocational Training in the Digital Work Environment and was CDU/CSU spokesperson for education, research, and technology policy.

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What impact do quotas for green fuels in aviation have on the ramp-up of a global hydrogen economy?

This presentation explores how binding quotas for sustainable aviation fuels (SAFs) influence the decarbonization of air transport and contribute to the broader development of a global hydrogen economy. It examines the potential for cross-sectoral learning—particularly from aviation to shipping—and analyzes the effects of green fuel quotas on international production and market dynamics of SAF, green methanol, and green ammonia. Key questions include the competitiveness of producing countries, the willingness to pay from major players like Maersk, and the feasibility of organizing global supply chains. The discussion also touches on political frameworks, industry reactions, technological readiness for fuel cell aircraft, and the prospects for long-haul hydrogen-powered flights before 2045.

Stefan Kaufmann

Antonio J Torija Martinez

Associate Professor at University of Salford, RefMap, ImAFUSA

About

Dr Antonio J. Torija Martinez is a leading expert in perception-driven research on aircraft noise, with core interests in noise measurement, modelling, psychoacoustics, and metrics. His current work focuses on psychoacoustic modelling for drones and ducted fan systems. He has authored 48 peer-reviewed articles (including in *Nature*), over 70 conference papers, and leads major projects such as EPSRC DroneNoise and Horizon Europe REFMAP and ImAFUSA. A Marie Curie Fellow, he has collaborated with MIT, UCL, Airbus, and NASA. He serves on NATO and ISO working groups, and in 2023 gave expert evidence to the House of Lords on noise and human health. He currently chairs QuietDrones 2024.

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Progress in psychoacoustic modelling of drone noise

This presentation will overview the current state-of-the-art methods to model and assess aircraft noise, with a particular focus on conventional practices used in regulatory and operational contexts. It will highlight key research gaps in extending these approaches to assess noise from emerging innovative air mobility (IAM) technologies, such as electric vertical take-off and landing (eVTOL) aircraft. These gaps include challenges related to novel vehicle configurations, complex noise signatures, and particular operational conditions with IAM aircraft operating closer to communities. The presentation will also showcase recent work at the University of Salford aimed at advancing modelling tools and assessment methods for IAM noise, including integrated efforts within an innovative framework of perception-driven engineering. Progress in auralisation and psychoacoustic methods for IAM noise will be presented and discussed.

Antonio J Torija Martinez

Abolfazl Simorgh

Postdoctoral Researcher at University Carlos III of Madrid (UC3M), RefMap

About

Abolfazl Simorgh is an Assistant Professor in the Aerospace Engineering Department at Universidad Carlos III de Madrid, Spain. His research focuses on Air Traffic Management, Aircraft Trajectory Optimization, Climate Change Mitigation, Mathematical Control Theory, and Optimal Control Systems. He has contributed to several European research projects, including FlyATM4E, ALARM, RefMAP, and F4ECLIM. Dr. Simorgh is also the developer of multiple state-of-the-art open-source Python libraries focused on estimating the climate impact of aviation and robust flight planning tools, such as CLIMaCCF, ROOST, and ROC. He has presented his work at numerous international conferences and has published 14 peer-reviewed articles in high-impact journals (including in a Nature Portfolio journal). His work has been recognized with several honors, including the Luis Azcárraga Aeronautical Innovation Award from Fundación ENAIRE in 2023, as well as best paper awards at both conferences and in a journal.

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Smart Use of Sustainable Aviation Fuels and Climate-Optimized Routing Toward Mitigating Contrail-Induced Environmental Impacts

Aircraft CO2 and non-CO2 emissions contribute significantly to climate change. Sustainable aviation fuels (SAFs) and climate-optimized flight planning are among the most immediate measures to mitigate these impacts. However, SAFs are more production-intensive and costly than conventional kerosene fuel, limiting their short-term scalability. Moreover, climate-optimized routing incurs additional costs and may lead to operational issues such as capacity-demand imbalances and increased complexity. In this work, we present a framework that strategically combines these two measures in a targeted manner to maximize climate benefits while accounting for the challenges associated with limited fuel availability and operational constraints.

We conducted a year-long analysis of the 150 most-traveled European routes in 2023. Results indicate that smartly allocating only 2% SAF to business-as-usual trajectories, specifically targeting flights that form strongly warming contrails, can deliver contrail-related climate benefits comparable to those achieved with uniform 100% SAF usage, yielding approximately 40% mitigation. This effectiveness is attributed to the reduction in soot particle emissions from SAF combustion, which shortens contrail lifetime and reduces associated radiative forcing. Furthermore, the strategic allocation of SAF on climate-optimized trajectories can achieve an additional 30-40% reduction in contrail-related climate impact compared to operating the same routes with kerosene alone. Notably, these benefits saturate at around 5% SAF usage, indicating that increased SAF availability does not necessarily yield proportional additional mitigation for contrail impacts.

Abolfazl Simorgh

Angelos Filippatos

University of Patras, Department of Mechanical Engineering & Aeronautics

About

Dr.-Ing. Angelos Filippatos is Assistant Professor of Machine Design at the Department of Mechanical Engineering and Aeronautics, University of Patras, Greece, where he leads the "Intelligent Design and Sustainable Engineering – IDEAS" group. From 2020 to 2022, he headed the "Hierarchical Topologies – Intelligent Systems with Material-Inherent Functions" group at the Dresden Center for Intelligent Materials (DCIM), TU Dresden. He holds a degree in Mechanical Engineering from the National Technical University of Athens (2010). His expertise includes mechanical system design, sustainability in engineering, multi-material structures, and intelligent design through parametric simulations and machine learning. His recent research focuses on applying these methods to support the energy transition in aviation and maritime sectors.

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Holistic Assessment and Design Approaches Towards Sustainable Aviation

Global sustainability targets are steering the aviation sector toward practices that reach well beyond isolated environmental-impact evaluations. Community-driven insights underline the importance of embedding sustainability thinking from the earliest design sketches through to final material choices. This abstract consolidates key findings from research undertaken at the University of Patras and illustrates how a holistic sustainability perspective can be integrated across the aviation design related activities.

First, the investigations show how material selection for aircraft structures can be assessed using a sustainability framework that takes into account on structural performance, environmental performance, cost efficiency, and circular-economy potential. A dedicated decision-support tool was developed to benchmark candidate materials against these three dimensions and to flag combinations that satisfy stringent sustainability thresholds.

Second, a suite of multi-criteria decision-making (MCDM) algorithms and normalization technique was systematically compared, revealing that methodological choices can significantly influence overall sustainability scores. Quantifying this sensitivity enables design teams to just the robustness of the rankings generated.

Third, the MCDM framework was scaled to whole-aircraft assessments. A hybrid analytic-hierarchy-process and weighted-addition model ranked aircraft incorporating novel fuels or propulsion concepts under varying stakeholder priorities, demonstrating how changes in weighting schemes can reorder preferred options.

Fourth, a sustainability-driven component-design workflow was formulated and validated on a composite aviation structure demonstrator. The method interweaves technological, environmental, economic, and circularity criteria into a single conceptual level, ensuring that trade-offs become visible before irreversible design

Holistic Assessment and Design Approaches Towards Sustainable Aviation

commitments are made. Collectively, the studies highlight a comprehensive yet pathway for embedding holistic sustainability assessment and design into aviation engineering, providing actionable guidance for industry as it charts a credible course toward greener flight. A composite sustainability index enables alternative designs to be optimized on this broader basis.

Main Message:

- Performance, environmental, economic, circular and social metrics merge in a n holistic framework, guiding early design teams to choose designs, materials and concepts that can meet aviation requirements.

Summary

In this work, results of a group of studies from University of Patras, relevant with the sustainability-oriented design in the aviation industry, will be presented. Sustainability definitions, assessment frameworks and practical design campaigns of aviation components will be the core results of the presented studies. Overall, our aim is to highlight the need for a holistic and comprehensive approach to sustainability assessment and sustainable design aviation with practical examples and robust proposals for the industry's way forward.

Constantin Tzembelicos

Group CEO at Element Aerospace Limited, Di-Pegasus

About

Constantin Tzembelicos is an aviation executive, entrepreneur, and investor with a career spanning aerospace engineering, airline operations, and aircraft leasing and currently the CEO of the Orphic Group. He has held C-level leadership roles in commercial airlines and VIP jet operations, including manufacturing, maintenance, and training. As Founder of Element Aerospace Ltd. and Business Development Director at Gannuver Trading Limited, he remains active in aviation, national defense, and civil protection. Constantin serves on the boards of the Canadian-Hellenic Chamber of Commerce and The Hellenic Initiative Canada. A licensed pilot and aircraft accident investigator, he is also an INSEAD International Directors Programme graduate and dedicated philanthropist.

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What Seaplanes Can Teach Us About UAM's Future

As aviation explores greener, more digitally integrated solutions, both legacy and emerging platforms face complex challenges. This presentation compares the historical yet niche operations of seaplanes with the rapidly evolving domain of Urban Air Mobility (UAM) and highlights opportunities for cross-sectoral learning. Despite differing trajectories, both aviation segments grapple with non-traditional infrastructure, regulatory uncertainty, and sustainability expectations. The comparison offers valuable insights for stakeholders navigating the path toward scalable, sustainable, and digitally enabled aviation systems.

Constantin Tzembelicos

Marina Basimakopoulou

Head of ATM/ANS Oversight,
Hellenic Civil Aviation Auth.

About

Marina Basimakopoulou is Head of the ATM/ANS Oversight, Regulations, and Certification Section at the Hellenic Civil Aviation Authority (HCAA) since its establishment in January 2022. A licensed Air Traffic Controller with over 20 years of experience as an Executive Radar Controller at Athinai-Makedonia ACCs, she is also an active ATM/ANS Inspector and undergoing training to become an EASA seconded inspector. Her multidisciplinary background includes a BSc in Biology, two MSc degrees (Nutrition and HR Management), and ongoing PhD research in Sociology of Technology and Applied Ethics. She is a certified PMI Agile Practitioner, Professional Scrum Master, ISO 9001 Lead Auditor, and an accredited adult trainer in non-formal and informal education.

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Regulatory Challenges in Aviation: The specific case of single European Sky(ses)

Regulatory Authorities have a significant role in ensuring safety, efficiency, security and sustainability, financial, social and environmental, in civil aviation operations. Their broad responsibilities, which affect almost every aspect of civil aviation industry, make them one of the key players in the field. These responsibilities cover Oversight, Certification and Licensing to Compliance Enforcement and Airspace Design, Market Access, Fare Monitoring and Consumer Protection as well as Rulemaking and Policy Development and Incident Investigation. Examples of well-known Regulatory Authorities include ICAO, FAA, EASA, UK CAA.

In Europe, SES is a major initiative by the European Union with the purpose of reforming the airspace over Europe, by unifying & modernizing Air Traffic Management System (ATM). Major Goals are improvements in safety, efficiency & environmental performance of ATM. Key Objectives of SES comprise the Reduction in Fragmentation of Airspace, improvement of Safety & Capacity, Cutting of Costs for airlines, gaining of Environmental Benefits. Main Components of SES are FABs, Common European Rules & Procedures, Technology & Innovation and Performance-based Regulation. Major Challenges to Implementation embrace National Sovereignty Concerns, Consultation between multiple Stakeholders, Project Management Issues, Civil-Mil Cooperation, timely Compliance ability.

Major Gains of full Implementation of SES include savings of billions of euros in operational costs, reduction in delays and greener environment. SES is about making Europe safer, cheaper, greener and more efficient.

Raffaello Mariani

Associate Professor at KTH Royal Institute of Technology, ImAFUSA

About

Raffaello Mariani is Associate Professor at KTH Royal Institute of Technology, Stockholm, Sweden. He holds a PhD in Aerospace Engineering from The University of Manchester, Manchester, UK. Assoc. His work focuses on aircraft aerodynamics and novel configurations, with a strong emphasis on experimental work.

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Perceived Safety in U-Space Drone Usage

Urban Air Mobility (UAM) is progressively being integrated, particularly in urban and suburban areas, providing services such as last-mile delivery of goods. Pilot use-cases of emergency medical assistance by drones have been trialed, and feasibility studies of future passenger air-taxi passenger services have been studies. As integration of these systems is expected to continuously increase, the assessing and understanding of public acceptance towards these new technologies has become a topic of interest in at research and agency level.

Within the frame of the European Union SESAR Joint Undertaking, a research project is ongoing to evaluate factors that influence citizens' acceptance of urban air mobility (UAM) in the European Union. This project, called ImAFUSA and which stands for Impact and Capacity Assessment Framework for U-space Societal Acceptance, aims at delivering a framework that will help local authorities and other U-space stakeholders and users with the delivery of socially acceptable and beneficial UAM deployment in cities. One of the aspects investigated within ImAFUSA is the perception of safety of citizens when it comes to the operation of drones in urban areas.

Analysis of data focused on four pre-determined indicators: drones flight velocity; drones-to-observer distance; drones-to-bystander distance; drones-to-buildings distance. A fifth indicator surfaced from the responses, namely drone-to-drone path direction.

Overall, the results indicate that participants mostly showed a positive level of perceived safety. A common outcome from all four cases was the initial visual recognition of the drones rather than acoustic recognition, as many participants indicated that the expected noise of the drones was too low and overwhelmed by surrounding noise. It is possible that this factor skewed the perception of safety towards a favourable outcome.

Zorana Milošević

Universidad Politécnica de Madrid,
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About

Dr. Zorana Milošević is a robotics and autonomous systems researcher. She holds a PhD from Universidad Politécnica de Madrid (UPM) and BSc/MSc degrees from the University of Belgrade. She works at UPM and coordinates the AIRSHIP project. She is also a postdoctoral researcher at Tampere University, Finland. Her research interests include autonomous robotics, guidance, navigation, and control, and field robotics. She truly believes in the potential of robotics to improve everyday life.

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AIRSHIP: Autonomous Electric Ground-Effect Cargo Craft

AIRSHIP is a Horizon Europe research project that envisions a new class of autonomous, electric vehicles operating in ground effect: the Unmanned Wing-in-ground Vehicle (UWV). These "flying ships" exploit the aerodynamic ground effect to achieve a higher lift-to-drag ratio, offering a highly efficient transport solution that bridges the gap between aviation and maritime mobility.

AIRSHIP project addresses key challenges in sustainable logistics, particularly for archipelagos and inland waterways across Europe, regions where conventional ships are too slow and aircraft too costly or environmentally taxing. We aim to lay the foundations for fast, flexible, low-emission, and infrastructure-light cargo transport systems.

AIRSHIP's core ambition is to develop a fully electric, autonomous UWV optimised for medium-distance cargo transport across coastal and inland regions. To achieve this, the project tackles key technical challenges in aerodynamics, energy systems, and autonomy. Research focuses on novel UWV design, advanced guidance, navigation, and control (GNC), renewable-based power architecture, and onboard artificial intelligence for cognitive and situational awareness.

Beyond its technical goals, AIRSHIP contributes to cleaner, quieter modes of transportation and supports European strategic autonomy in green mobility. It also opens new business models for regional cargo logistics.

This presentation will introduce the project's vision, the unique technical challenges of operating in ground effect, and the innovations under development. We will highlight current progress, upcoming milestones, and the broader implications of the AIRSHIP concept.

Zorana Milošević

Ioanna Moscholidou

Postdoctoral researcher at Aegean University, Di-Pegasus

About

Ioanna Moscholidou is a transport planner specialising in transport policy and governance issues. She holds an MEng in Rural and Surveying Engineering from the Aristotle University of Thessaloniki (2013), an MSc in Sustainable Transport (2014) from the Institute for Transport Studies, University of Leeds and a PhD in Transport Governance (2022) from the same department. Between 2014 and 2023 she worked as a transport planner in the United Kingdom, initially as a consultant and later in the public sector focusing on urban transport policy and strategy. Since 2024 she is a postdoctoral researcher at the University of the Aegean.

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Seaplanes in Greece: sustainability issues and policy objectives

This presentation examines the potential of seaplanes as a transport solution in Greece, focusing on improving connectivity for island communities, accommodating growing tourism demand and addressing sustainability concerns. Despite being discussed for over a decade, seaplane operations have not been successfully established in Greece. Through interviews with international stakeholders, we identify key characteristics of seaplane operations across the world and barriers to their success, and we assess their sustainability challenges. We highlight the need for close collaboration between policymakers and operators as a key driver for successful seaplane operations in Greece, and we provide a critical discussion of the potential role of seaplanes in the Greek market. Finally, we recommend that evidence-based policymaking is essential to ensure new transport solutions meet socio-economic and environmental objectives.

Ioanna Moscholidou

Thank you

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