



ROADVIEW

Robust Automated Driving in Extreme Weather

Issue 1/September 2023

Why ROADVIEW

p. 2

**ROADVIEW Pathway to Success:
The CCAM Partnership**

p. 4

ROADVIEW events

p. 6



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Welcome to the ROADVIEW Newsletter

Dear reader,

Welcome to the first issue of our newsletter!

In this edition, we introduce the ROADVIEW project, its goals, significance, and the various activities of our consortium. Our project coordinator, Eren Aksoy, shares insights on the potential impact of ROADVIEW on society.

We also explore the collaboration between the project and the Connected, Cooperative, and Automated Mobility (CCAM). This partnership aims to support the development, scaling, and practical application of innovative CCAM solutions.

Furthermore, we touch upon ROADVIEW's presence at high-level conferences, aiming to increase project visibility, foster collaboration, and engage potential investors. We have also included details about the upcoming ROADVIEW webinar, which offers readers an overview of the Autonomous Vehicles (AVs) industry.

To conclude, this issue features profiles of two key ROADVIEW partners: Halmstad University (HH) and the Finnish Geospatial Research Institute (FGI).

We hope you enjoy the read!
accelopment on behalf of the project consortium



Why ROADVIEW?

Thanks to the evolution of robotics, communication infrastructures, and sensor technologies, the Cooperative, Connected, and Automated Mobility (CCAM) industry has grown exponentially in the past decade. Automated Vehicles (AVs), often referred to as self-driving vehicles, have the potential to revolutionise the mobility industry, making it safer, cleaner, more efficient, and user-friendly.

However, although giant steps have been made in this regard, most of AVs have been trained and tested under optimal weather conditions and with clear visibility. Complex environment and traffic conditions have a major impact on the safety and operations of AVs. Weather affects not only the vehicle performance but also the roadway infrastructure, thereby increasing the risk of collision and traffic scenario variations. Thus, to ensure wide acceptance, and exploit the all the benefits of CCAM, a technology capable of performing equally well under any weather conditions must be developed.

In response to this challenge, funded through the Horizon Europe programme of the European Union and bringing together partners from academia and industry, the ROADVIEW project

Relevance

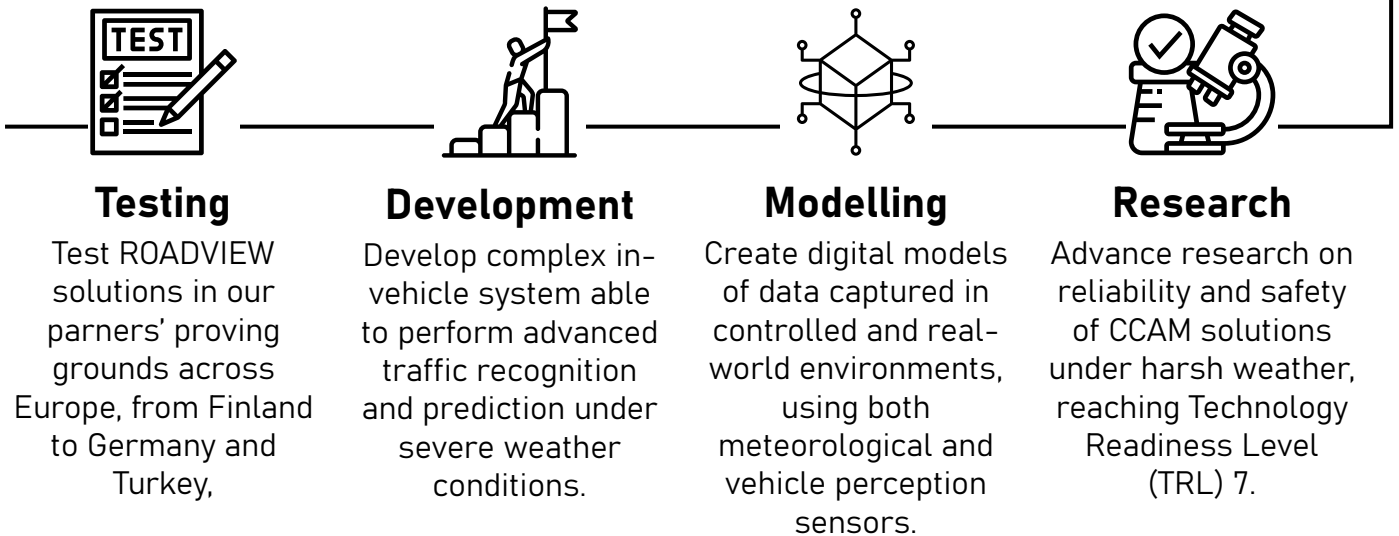


Click on the image or [here](#) to hear from Eren Aksoy talking about the ROADVIEW project relevance and impact on society.

aims to develop a complex in-vehicle system able to perform advanced traffic recognition and prediction under severe weather conditions, such as snow, fog, and rain. Based on a cost-efficient multisensory setup, the revolutionary ROADVIEW systems will independently perceive the environment conditions and make decisions based on its enhanced sensing, localisation, and improved object and person classification.



Our key activities



WITH THIS IN MIND, ROADVIEW'S AMBITION IS TO:

- 01** Develop a reliable, weather-resilient, and embedded in-vehicle perception system with increased performance and accuracy.
- 02** Deliver an on-board, real-time, fail-safe, unambiguous and traceable weather-aware decision-making system for Connected and Automated Vehicles
- 03** Decisively advance the testing capabilities of European industries to accelerate testing and validation of automated driving software, hardware, and vehicle integrations of perception and decision-making systems



ROADVIEW pathway to success: The CCAM partnership

Despite the expected benefits, Connected, Cooperative, and Automated Mobility (CCAM) solutions today are striving to reach the market, due to the existence of different barriers. The lack of societal awareness of the benefits of CCAM-enabled mobility often results in limited demand for the technology. Additionally, the CCAM solutions are still insufficiently mature for the wider market uptake, while current investments in CCAM Research & Innovation (R&I) are inadequate and fragmented lacking a long-term vision. Equally important, demonstrations and scale-ups are also limited since a well-organised, extensive, and complex cross-sectorial value chain is still required to build complete CCAM solutions.

Officially launched on June 23rd, 2021, the CCAM Partnership is a European co-programmed partnership with the goal to accelerate the development, upscale, and implementation of innovative CCAM technologies and services, while ensuring a more user-centred and inclusive mobility system that increases road safety, and limits congestion and environmental pollution. The CCAM Partnership was created to accelerate the innovation pace and implementation of automated mobility by coordinating a wide range of projects within the Horizon Europe framework. It is its ambition to promote more collaborative research, testing, and

demonstration projects at the European level, removing barriers to the efficient rollout of automation technologies and services, and developing a coherent, longer-term vision and strategy for targeting systemic solutions.

Today, the CCAM Partnership is organised in 7 clusters (See Fig.1), which structure its activities, organising the necessary R&I actions to ensure advancement in the field, while aligning perspectives from road users and consumers, public policymakers, road operators, and industry. All the clusters are interlinked and provide input to one another, and altogether they form a comprehensive framework for ensuring the future deployment of CCAM solutions.

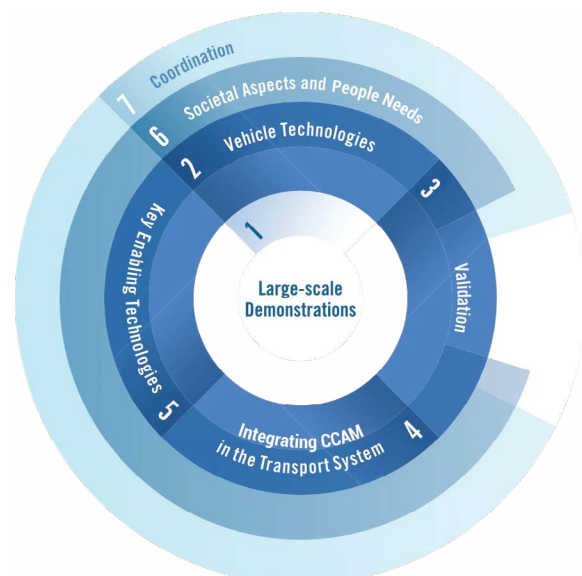


Figure 1. CCAM Clusters, retrieved from the CCAM website.

CCAM Ambitions and collaborations opportunities

Since its foundation, the CCAM Partnership has set forth an ambitious goal: to conduct large-scale demonstrations of user-oriented and seamlessly integrated CCAM solutions. By 2030, the aim is to establish at least 30 demonstration sites across Europe, showcasing the benefits of efficient and sustainable mobility both for people and goods. These demonstrations will highlight the transformative potential of CCAM technologies in enhancing transportation systems and improving overall mobility experiences. The CCAM Partnership is dedicated to driving innovation and shaping the future of European mobility through these extensive and impactful demonstrations.

Within the framework of the CCAM Partnership, ROADVIEW, together with the sister project EVENTS, has secured funding through one of the first CCAM calls: HORIZON-CL5-2021-D6-01-01. These projects fall under CCAM Cluster 2, Vehicle technologies, and specifically address the need for powerful and reliable on-board perception and decision-making technologies, capable of handling complex environmental conditions. The integration of advanced sensors, control systems, and computational sources is crucial for future automated vehicles, ensuring their safety, reliability, and compliance with regulations.

It is in the CCAM Partnership's vision for the ROADVIEW and EVENTS projects to foster close relationships in their R&I activities, aligning their work to the objectives and Key Performance Indicators (KPIs) of the CCAM Partnership, to overall accelerate the maturation of the technology. Equally important, the Partnership expects ROADVIEW to engage with and provide input to representatives from the FAME project, an initiative that is maintaining the Connected and Automated Driving (CAD) Knowledge Base while developing and validating common

methodologies and tools to facilitate the sharing of best practices and lessons across the CCAM value chain. This is an important step to build an efficient cross-sectorial value chain.

Final remarks: Why is the CCAM crucial for ROADVIEW?

Thanks to the active membership of ROADVIEW partners to the CCAM Partnership, the project can benefit from knowledge exchange and networking, standardisation of the ROADVIEW systems, and increased visibility. The CCAM Partnership provides a forum for all the CCAM EU-funded projects, ensuring a high and transparent flow of information. Ad-hoc activities such as the CCAM Multicenter meetings, the EUCAD conference, and various workshops, are organised regularly to provide ROADVIEW partners and their CCAM peers with the opportunity to connect with relevant stakeholders. This collaborative environment fosters knowledge exchange, leveraging on existing data, and paves the way for impactful advancements in CCAM, filling the gaps in the current fragmented R&I landscape, and ultimately leading to better coordination of R&I and large-scale testing activities in Europe.

Moreover, the lack of standardisation, and more specifically the current fragmented value chain, still represents a major barrier to the wider adaption of CCAM solutions. ROADVIEW's cooperation with the CCAM Partnership ensures that the perception and decision-making systems developed within the ROADVIEW project are compatible with the systems and technology developed within other CCAM projects, as well as with the current regulatory framework, where existing.

Lastly, the CCAM Partnership provides a community for the ROADVIEW project to increase its visibility, raising awareness about the CCAM technologies and the benefits for society at large. Joint events and future collaboration opportunities are assessed periodically. Enhancing the project results visibility is crucial for societal acceptance of the ROADVIEW systems and for the technology uptake once it will have reached maturity.

ROADVIEW events: Pivotal events recap

May and June 2023 were defining months for the ROADVIEW project's dissemination. The consortium made appearances at several high-level conferences, fostering visibility, collaboration, and sparking investor interest.

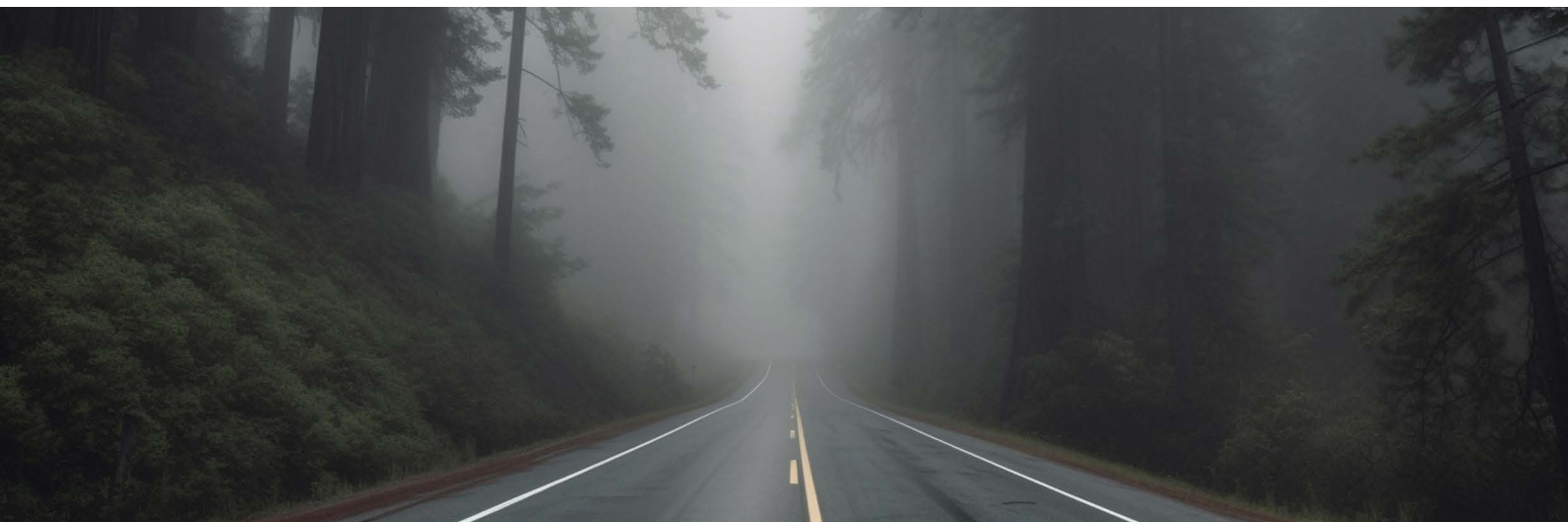
In May, ROADVIEW took part to three esteemed conferences. At the '[Sustainable AI and AI for Sustainability](#)' event, held in collaboration with the Swedish Presidency of the Council of the European Union, ROADVIEW was showcased prominently. The project made headlines in major Swedish publications, including the [Göteborgs-Posten](#), and was featured on [TV4](#), a national broadcasting service. Following closely was the [4th European Conference on Connected and Automated Driving \(EUCAD\)](#), where ROADVIEW, represented by Martin Sanfridson (RISE), secured a dedicated booth and engaged with potential collaborators. Finally, at the 15th ITS European Congress, the largest event centred on intelligent mobility, ROADVIEW's innovative perception and control solutions captured significant attention.

June commenced with the '[Resilient and Robust Sensing for Automated Systems for Transportation](#)' conference, organised by the ROADVIEW partner WMG in Coventry. Here, the Finnish Geospatial Research Institute (FGI) shed light on enhancing data integrity

and optimisation for autonomous systems. This gathering focused on refining the perception abilities of self-driving vehicles. Mid-June saw ROADVIEW at the '[CVPR Workshop](#)' in Vancouver, Canada, tackling the complexities of poor weather conditions for autonomous vehicles. Eren Aksoy presented innovative solutions to ensure vehicles could see and navigate efficiently despite challenging weather. He emphasised ROADVIEW's commitment to creating safe and reliable self-driving cars that can adapt to any environmental challenge.

Simultaneously, ROADVIEW hosted a [seminar spotlighting Dr Joonwoo Son](#) at Halmstad University. Dr Son, an international collaborator with ROADVIEW and founder of South Korea's successful robotaxi startup [Sonnet.AI](#), shared insights into the entrepreneurial journey in the autonomous driving sector.

Throughout these two months, ROADVIEW's project partners not only heightened the project's profile but also solidified its standing as a leading initiative dedicated to advancing autonomous driving technology in Europe and globally. The team's proactive participation underscores their commitment to creating a future where autonomous vehicles operate efficiently, safely, and sustainably.



ROADVIEW webinar:

An introduction to the AV industry

How far are we in the development of autonomous vehicles? What are the challenges and hurdles encountered on the way to autonomous driving? And how is ROADVIEW addressing these challenges?

If you are interested in the answers to these questions, then join the first episode of our webinar series, An introduction to the AV industry!

We are delighted to announce that it will feature several keynote speakers in the field of Connected, Cooperative, and Automated Mobility (CCAM) such as:

- **Eren Erdal Aksoy**, Associate Professor at the School of Information Technology of the Halmstadt University and Coordinator of the ROADVIEW project. He will guide the audience through the event and introduce the ROADVIEW project as well as the webinar series.

- **Edward Griffor**, Associated Director for Cyber Physical Systems at the National Institute of Standards and Technology (USA), who will speak about Adaptation, resilience, and robustness of CCAM solutions.
- **Steve Dellenback**, Vice President R&D – Intelligent Systems Department, and **Ryan D. Lamm**, Executive Director R&D – Robotics & AI, at the Southwest Research Institute (USA) presenting the current and short-term CCAM off-road use cases.
- **Ali Peker**, CEO of Adastec Corp. (USA) who will speak about Safety of CCAM in harsh weather conditions.

The event will take place on the **2nd of October from 14:00 to 15:30 CEST** and will be delivered free of charge to all audiences.

Webinar programme

Sessions

Welcome & general introduction to the ROADVIEW Webinar series

Adaptation, resilience, and robustness of CCAM solutions

CCAM current and short-term offroad use cases

The Challenge: Safety of CCAM in harsh weather conditions

ROADVIEW: the pathway to robust and resilient systems in all weathers

Q&A Session



Interested in ROADVIEW webinars?



Scan the QR Code or [click here](#) to learn more and register or contact us

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Eren Erdal Aksoy, ROADVIEW coordinator, Halmstad University, eren.aksoy@hh.se

Meet the partners: Halmstad University



Halmstad University (HH) is a prestigious Swedish institution renowned for its high-quality education and research. With a diverse range of programmes and a student population exceeding 10,000, it provides a dynamic learning environment.

The institution's [Centre for Applied Intelligent Systems Research \(CAISR\)](#) zeroes in on the development of “aware” intelligent systems, encompassing human-awareness, situation-

awareness, and self-awareness. The focus on awareness has become increasingly significant in the development of intelligent systems designed for the imminent “ubiquitous future,” where data, sensors, and embedded computers are ubiquitous. Such “aware” intelligent systems possess the ability to engage in communication with individuals, discern their intentions, and integrate diverse sources of information to form a comprehensive understanding, all while actively monitoring themselves.

The centre's research revolves around designing systems capable of autonomously constructing knowledge from real-life streaming data, generated through the interaction between the system and its environment. This means that the systems can handle events that are unknown at the time of their design. The motivation for engaging in aware systems research lies in striving towards the construction of intelligent systems capable of lifelong self-learning, thereby minimising the need for constant supervision and empowering them to navigate unexpected situations.

The CAISR brings in an extensive track record of over 15 years in AI research, as evidenced by more than 500 scientific publications, 6 patents, and 8 edited books in this domain. Nearly 50 researchers collaborate under the umbrella of CAISR, having previously participated in various European projects dedicated to the advancement of intelligent systems. The ROADVIEW project strongly aligns with the CAISR profile, encompassing research on aware intelligent systems, including robotics. CAISR will contribute its expertise in artificial intelligence, machine learning, computer vision, and robotics to this endeavour.



Click on the image to hear from Eren Aksoy talking about the HH and its role within the project.

Meet the Team



Eren Aksoy
Associated Professor



Abu Raisuddin
Doctoral Researcher



Tiago Cortinhal
Doctoral Researcher



Idriss Gouigah
Doctoral Researcher

Meet the partners: Finnish Geospatial Research Institute



The Finnish Geospatial Research Institute (FGI) stands as a beacon in the world of geospatial sciences. Affiliated with Finland's National Land Survey, FGI, previously known as the Finnish Geodetic Institute, seamlessly marries tradition with cutting-edge innovation.

With its dynamic, international cadre of approximately 120 professionals, FGI's core mission is to forge ahead in scientific endeavours encompassing geodesy, positioning, navigation, cartography,

geographic information sciences, photogrammetry, and remote sensing. Their dedication goes beyond pure research, ensuring that this profound knowledge is disseminated across various facets of society.

In the broader context of the European geospatial information sciences and technologies sector, FGI's prominence is evident. Their expertise has been instrumental in coordinating a plethora of international projects over the years.

From 2009 to 2020, FGI was recognised as the top-performing Finnish Research Environment in the Web of Science, assessing output against input. By December 2018, FGI had earned accolades as Finland's second preeminent research organisation, gauged by the quality of its scientific publications using citations per article as the metric. It's noteworthy that 74% of these citations during this time frame originated from the Principal Investigator (PI) group.

Further solidifying their esteemed reputation, in January 2019, this PI group was acknowledged as the global leader in remote sensing research. This recognition was based on a decade-long analysis of the respected open-access journal, Remote Sensing.



Click on the image to hear from Heikki Hyyti talking about the FGI and its role within the project.

Meet the Team



Juha Hyyppä
Director



Heikki Hyyti
Research Scientist



Antero Kukko
Professor



Annukka Pekkarinen
Project Communication



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