Automotive Intelligence for/at Connected Shared Mobility

Deliverable	Report on Project Clustering and Synergies		
Involved WPs	WP8	**Deliverable type**	Confidential
Project	*AI4CSM*	**Grant Agreement Number**	101007326
Deliverable File	D8.4	**Last Modified**	03.06.2023
Due Date	30.04.2023	**Actual Submission Date**	03.06.2023
Status	Final	**Version**	0.7
Contact Person	George Dimitrakopoulos	**Organisation**	Infineon Technologies AG (IFAG)
Phone	+49 151 7300 2121	**E-Mail**	Dimitrakopoulos.external@infineon.com

Document history

V	Date	Author	Description
0.1	02.04.2023	George Dimitrakopoulos	Initial Version
0.6	24.04.2023	Jochen Koszescha	Merging and Formatting
1.0	03.06.2023	George Dimitrakopoulos	Final version after integrating reviewer comments.

Disclaimer

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1   Executive summary

The aim of the overview is to highlight the transdisciplinary nature of *AI4CSM* project and to stimulate fostering the cross-fertilization of ideas and knowledge, for achieving innovation, producing synergies, generative inquiry and achieving praxis – knowledge, theory, application in the area of connected and shared mobility based on AI tools and methods in areas like fail-aware, fail-safe, and fail-operational integrated electronic components and systems.

In this respect, this deliverable has constituted a report on project clustering activities performed in the context of *AI4CSM*. In particular, the deliverable outlined several projects and initiatives that fall in the realm of smart mobility within ECSEL and Horizon Europe (also H2020), as well as detailed all activities related to project communication, which includes also synergies and liaison with other projects.

In particular, the report contains information on activities related to:

a) Identification of projects that *AI4CSM* has been collaborating with
b) Establishment of a clustering committee for those projects
c) Organization of common meetings
d) Participation of *AI4CSM* members in meetings of similar interest organisations, as well as large scale events, for communication among projects reflecting different perspective and solution approaches.

2 Publishable summary

The Vision of **AI4CSM** is to build Europe's intelligent electronic component and systems for ECAS 2030 vehicles supporting European mass market production, manufacturability and scalability based on the Green Deal principles (incl. Vision Zero and Safe System) to address the sustainable urbanization challenge defined by the United Nations.

The mission of the project is to develop the functional architectures for next generation EVs based on ECS, embedded intelligence and functional virtualization for connected and shared mobility using trustworthy AI. This mission applies on different mobility sectors, including the automotive and semiconductor sector as well as the society.

In this respect AI4CSM aims to enable the future mobility developments following the electrification, standardisation, automatization and digitalisation implementation strategy by providing new AI-enabled electronic component and systems for ECAS vehicles for advanced perception, efficient propulsion and batteries, advanced connectivity, new integration and platform concepts and intelligent components based on trustworthy AI.

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3 Introduction & Scope

Reaching a climate neutral European economy by 2050 is feasible from technological, economic and social perspectives, but it requires the implementation of deep societal and economic transformations throughout the next generation. The major challenge for Europe's industry is to be competitive with the worldwide leading manufacturers in terms of intrinsically robust, scalable and standardized EVs (Electric Vehicles) and AVs (Automated Vehicles) for the upcoming mass market based on electronic components and systems (ECS) technologies providing usability for the customer base in Europe.

In this respect, the scope of this report is to highlight the transdisciplinary nature of *AI4CSM* project and to stimulate fostering the cross-fertilization of ideas and knowledge, for achieving innovation, producing synergies, generative inquiry and achieving praxis – knowledge, theory, application application in the area of connected and shared mobility based on AI tools and methods in areas like fail-aware, fail-safe, and fail-operational integrated electronic components and systems.

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4 ECSEL, Horizon Europe and H2020 projects related to connected and shared mobility and highly automated vehicles

The ECSEL Joint Undertaking[1] has several projects focusing on the Smart mobility the projects are influencing the development in the autonomous vehicle's domain[2]. Likewise, Horizon Europe (HE) and H2020 projects are also influencing AI4CSM work.

AI4CSM has had information exchange with all of them, mostly in terms of monitoring the state of the art in research projects, so as to have a clearer view of how researchers are tackling this domain at a pan-European level.

TABLE 1: LIST OF PROJECTS RELATED TO AI4CSM

Project acronym	Project description and potential synergies with AI4CSM
PRYSTINE	The ECSEL JU project PRYSTINE serves as an input to *AI4CSM*, so as to widen the solutions towards the perception of highly automated vehicles. As an example, in PRYSTINE Infineon developed a 1D MEMS mirror and MEMS driving electronics in order to address LiDAR applications. Based on these results, *AI4CSM*'s novel technologies (2D MEMS Mirror, MEMS Driver ASIC for 2D Lissajous scanning, compact scanner module) and concepts are researched and developed. Moreover, in PRYSTINE, part of the work was devoted to the transmission of situation awareness information from a cloud-based backend to the vehicle. The results of this work will constitute the software basis for the vehicle gateway on which the V2X transmission can be built. Moreover, PRYSTINE findings will be exploited so as to more appropriately structure the in-vehicle ECS enablers, mostly based on AI tools and methods, which *AI4CSM* will deliver.
3cCar	The Integrated components for complexity control in affordable electrified cars (3Ccar) project addressed Smart mobility applications through technology developments in Process technologies, Cyber physical systems, Smart systems integration and the ever-growing complexity in mobility systems, especially in electrified vehicles. The overall project facts are given to the right. Together with AutoDrive, 3Ccar received the first-place award at EFECS 2017, themed "Our Digital Future". The final project review was held in October 2018 and culminated with a session of project technological demonstrators during the networking event ECA2030 Graz (Austria). 3Ccar provided novel, integrated components for complexity control for both the automotive and aviation domains to ensure in-vehicle systems that monitor sensor data while performing real-time evaluation and allowing remote programming. It also provided new and scalable methods to evaluate advanced control systems in realistic settings.
AUTODRIVE	The ECSEL JU project AUTODRIVE (2017-2020) pursued basic research and development in the field of environmental perception technologies with a particular focus on optical Car2X communication. As *AI4CSM* has part of its work focusing on introducing robustness and functional safety into perception technology, it will extend the maturity of technologies developed in AUTODRIVE towards achieving the key fail-operational behavior.

EnableS3	The initiative to Enable validation for high automated safe and secure systems (ENABLE S3) addresses Smart mobility together with Smart health, Cyber physical systems and Design technology for various domain support. The overall project facts are given to the right. The objective is a significant time and cost reduction for the validation process across six industrial domains (automotive, aerospace, rail and maritime, as well as the health care and farming sectors) through virtual and semi-virtual testing and verification, coverage-oriented test selection methods and standardization to pave the way for efficient development of highly automated and autonomous systems (ACPS). For the automotive domain the following use cases are defined: Highway pilot is defined, Intersection crossing, Context-aware in-car reasoning system, Traffic jam pilot with V2X communication, and Valet parking.
RobustSense	This ECSEL project focuses on reliable, secure and trustable sensors for automated driving in adverse weather conditions. *AI4CSM* continues in this direction by focusing on the aspects of redundancy, reliability and availability of sensors, in the context of fail-operational perception systems in a variety of ODDs. These topics are addressed through sustained innovations across the entire automation chain.
DAIS	The DAIS team that participates also in *AI4CSM* has developed a data transport layer for message-formatted data on top of a custom gateway architecture. This will be the base architecture for the data transport in the roadside unit demonstrator in *AI4CSM*.
ADACORSA	ADACORSA is an ECSEL project focusing on exploiting the findings of ECS in the automotive domain to create drones operating beyond the visual line of sight. In there, V2X-based data links between drone and ground (both directions) were developed. As such, this work provides the basis for the V2X-based communication from roadside unit to vehicle investigated within *AI4CSM.* Moreover, Within ADACORSA, the team has developed a Flight Information Management (FIMS) System enabling the management of Unmanned Aerial Vehicles (UAVs). From a conceptual point view, management of UAVs and management of Autonomous Vehicles have similar theoretical foundations, and therefore, work within this project is based on the outcome of work conducted in ADACORSA.
AIMS5.0	AIMS5.0 aims at European digital sovereignty in comprehensively sustainable production, by adopting, extending and implementing AI tools & methods and chip technology across the whole industrial value chain to further increase the overall efficiency. Vulnerability of existing supply chains in crisis shows the need for shorter supply chains and keeping production in Europe. AI enabled fabs will be given more output and higher sustainability, which makes them more competitive on a global scale. *AI4CSM* joins with AIMS5.0 the common vision of European digital sovereignty by adopting, extending and implementing AI tools & methods and chip technology. *AI4CSM* partners will utilize synergies with AIMS5.0, which focuses on manufacturing industries, for driving innovation in the field of low-level, fundamental Electronic Components and Systems (ECS) for on-board, robust, powerful, fail-operational and integrated perception, cognition, decision making, secure automation and communications for highly automated vehicles.
i-GAME	*AI4CSM* partners were involved in safety assessment of multi-brand cooperative and automated vehicles participating in the Grand Cooperative Driving Challenge, as part of iGAME. This also included functional safety development of cooperative automation. *AI4CSM* will continue this development for "technology agnostic" testing of multi-brand, multi-type, connected and automated vehicles. *AI4CSM* will also continue with the definition of an integrated, holistic, testing framework that allows interaction between methodologies and tools at different system levels (according to its granularity).
SAHARA / REPAIR	SaHaRA approaches have been investigated to efficiently implement neural networks in embedded hardware. The successor project REPAIR is looking into making these networks explainable as a step towards improved functional safety. *AI4CSM* will exploit the project findings of both national German projects.

iCompose	Integrated Control of Multiple-Motor and Multiple-Storage Fully Electric Vehicles. iCompose deals with certain aspects of ADAS and partly/highly automated driving. The main focus of **AI4CSM** will be to investigate methods, tools, and processes and develop application software for mixed criticality embedded control systems.
HEADSTART	Definition of testing and validation procedures of Connected and Automated Driving functions including key technologies such as communications, cyber-security and positioning. The project drives a harmonized European solution for testing and validation of automated road vehicles. **AI4CSM** will use those outcomes as input to the development, integration and validation phases of WP1 – WP4. Furthermore, input will be provided for validation procedures for some of the use cases to be deployed (e.g. Connected Highway Pilot).
Trustonomy	The vision of Trustonomy is to maximise the safety, trust and acceptance of automated vehicles by addressing the technical and non-technical challenges through a well-integrated and inter-disciplinary approach, bringing domain experts and ordinary citizens to work closely together. **AI4CSM** will use Trustonomy outputs in terms of performance, ethics, acceptability and trust, different relevant technologies and approaches, including driver state monitoring systems, HMI designs, risk models, and driver training methods, as well as apply them in the context of ECS for the automotive domain.
NewControl	NewControl (ECSEL JU project), started in April 2019, develops and delivers virtualized platforms for each vehicular sub-system essential to autonomous operation at SAE Level 3+. Each of these unifies the critical components required to realize a specific function – perception, cognition, control through vertical integration within an adaptive (not rigid) architectural framework. **AI4CSM** will use NewControl's findings on technologies critical to automated driving, enabling mobility as a service.
ArchitectECA2030	ArchitectECA2030 (ECSEL JU project), which started in July 2020, works on implementing a unique in-vehicle monitoring device able to measure the health status and degradation of the functional electronics empowering model-based safety prediction, fault diagnosis, and anomaly detection. A validation framework comprised of harmonized methods and tools able to handle quantification of residual risks using different data sources is provided to ultimately design safe, secure, and reliable ECA vehicles with a well-defined quantified, and acceptable residual risk across all ECS levels.
TEACHING	**TEACHING** develops a computing toolkit for building efficient autonomous applications leveraging humanistic intelligence. Components that will be reused include AI algorithms on human stress and comfort modelling, driving simulation study and user perception measurement techniques, dependability approaches that combine safety and AI.
5G-Routes	In the H2020 project "5th Generation connected and automated mobility cross-border EU trials" (2020-2023) develops a CAD platform (perception, communication, drive-by-wire, route planning, HD maps, etc.), based on 2x Kia Soul EV, which **AI4CSM** project will further exploit to deploy, test, validate and demonstrate the relevant outcomes.
SUNRISE	Sunrise (Safety assUraNce fRamework for connected, automated mobIlity SystEms) defines, implements and demonstrates harmonized and scalable safety assessment methodologies, procedures and metrics tailored for use cases, a federated European Scenario Database framework and its necessary data interfaces, a commonly agreed simulation framework including tools and interfaces. **AI4CSM** will work closely with SUNRISE in identifying cooperative mobility stakeholders such as policy makers, regulators, consumer testing, user associations and all relevant stakeholders. This will be particularly important in the domain of end-to-end, AI/ML-powered resilience for data ingestion.
ATHENA	The EU funded Althena project will establish the basis of trustworthy AI while using it at its full capabilities for the benefit of society. The team will contribute to building explainable AI (XAI), researching data, models and testing. They will create a human-centric methodology and propose a set of key performance indicators on XAI. Moreover, data and tools will be made available via European data-sharing initiatives. **AI4CSM** will take inputs form ATHENA especially in the context of AI algorithms for decision making.

DENSE	The 24/7 automotive sensing system (DENSE) project addresses Smart mobility and self-driving cars as a rapidly growing technology. More precisely it addresses fully reliable environment perception technology capable of sensing their surroundings under all weather conditions [11][15]. The overall project facts are given to the right. The prevailing project innovation results were recently presented to the public through The International Tampere Smart City Week in October 2018 (Finland). The main objective is to develop and validate a 24/7 sensor suite for driver assistance and automated driving that enables cars to operate safely even in severe weather conditions. This new sensor set will combine three technologies which could not deal with all sorts of weather conditions individually: (i) Radar, (ii) Gated short-wave infrared camera, and (iii) Short-wave infrared LIDAR. A high-level fusion platform will be implemented.
TEMPO	TEMPO (Technologies and hardware for neuromorphic computing) is a collaborative research project. TEMPO develops technologies and hardware solutions to broaden the applicability and strengthen the European ecosystem of integrated neuromorphic computing, enabling Artificial Intelligence in Edge devices and applications.
ANDANTE	Edge computing is creating new possibilities in Internet of Things (IoT) applications. To create the AI foundations for future products in the edge IoT domain, the EU-funded ANDANTE project aims to leverage innovative IC (integrated circuits) accelerators based on artificial and spiking neural networks in order to build strong hardware and software platforms for application developments. Moreover, the resulting IoT devices will combine extreme power efficiency with robust neuromorphic computing capabilities. By achieving efficient cross-fertilisation between major European foundries, chip designers, system houses, application companies and research partners, the project will build and expand the European ecosystem around the definition, development, production and application of neuromorphic ICs. The project's work will promote innovative hardware and software deep-learning solutions for future IoT at the edge products that combine extreme power efficiency as well as robust and powerful cognitive computing capabilities.

5   The Mobility.e lighthouse initiative and other external initiatives

The Mobility.E Lighthouse is one of three lighthouses clustering important projects introduced by the ECSEL Joint Undertaking to signpost subjects of common European interest[3]. Within an internal strategic process of the Mobility.E Lighthouse, R&D&I topics are mapped and structured in a landscape that can be used as a tool to facilitate communication and translation between the different levels of the value chain, ultimately bridging the gap between component development and end-user demands. In order to react to the ongoing mobility transformation, the identified topics go beyond traditional automotive research fields in order to address novel solutions and respective legal, societal and economic challenges. *AI4CSM* is influenced by this initiative and focuses its statements, priorities, initiatives and outcomes.

CASE (Connected, Autonomous, Shard and Electric vehicles) are developing rapidly and are driving transformation across mobility. According Forbes' by 2030, there will be 700 million connected cars, 90 million autonomous vehicles and 250 million electric and hybrid vehicles on the roads. Vehicles of the future are changing how we travel[4].

US Governments catalyzing the emergence of a new mobility ecosystem: "The US Department of Transportation (DOT) launched **the Smart Cities Challenge** as a fillip for cities and states to experiment with cheaper, faster, safer, greener, more efficient, and more convenient transportation for citizens. The 78 submissions, including that of eventual winner Columbus, OH, spanned a wide range of intermodal innovations and provided an **incubator for new forms of transportation and new ways to consume mobility**, potentially making them available and commercially viable sooner than a market-only approach would create. The DOT continues to serve its primary mission of **public safety, while demonstrating that it can play a pivotal role in driving innovation through investments and regulation**. States such as **Nevada, Michigan, Pennsylvania, and Florida are developing pilot programs and implementing regulatory changes to accelerate adoption of the future mobility ecosystem**, as they seek to provide more and better options for their citizens and to spur economic development." [5]

A report from INDIA: Covid-19 allowing, estimates on 2019 indicated that India's urban population will nearly double in the next decade, to approximately 600 million in 2030 and forecasts suggest that by then India's urban population will take almost 500 million trips per day. While this rapid growth presents major policy and business challenges for India's public and private sectors, respectively. It also presents an enormous economic opportunity. If India **is successful in reaching its EV target**, the market could be enormous. Even under a [shared mobility paradigm](), over 46,000,000 vehicles (two-, three-, and four wheelers) could be sold in 2030, saving 876 million metric tons of oil equivalent, worth $330 billion (Rs 20 lakh crore) and 1 giga-tonne of carbon-dioxide emissions by 2030. This annual market size would present an opportunity for Indian companies to become leaders in EV technology on a global scale, said a press release. "The FICCI-RMI report on 'Enabling the Transition to [Electric Mobility]() in India' highlights the way forward to accelerate electric mobility in India while addressing the key areas of shared mobility services, interoperable transport data, EV charging infrastructure and manufacturing," said K Ramchand, chairman, FICCI national committee on infrastructure and managing director, IL&FS Transportation Networks Ltd.[6]

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[3] https://www.mobilitye.eu/

[4]   https://www.intelligent-mobility-xperience.com/case-the-current-state-of-connected-autonomous-shared-and-electric-mobility-a-909917/

[5]   https://www2.deloitte.com/content/dam/insights/us/articles/3367_Future-of-mobility-whats-next/DUP_Future-of-mobility-whats-next.pdf

[6] https://www.sharedmobility.news/india-2/

6 *AI4CSM* activities M13-M24 creating synergies

AI4CSM has tried from the beginning to establish links to the aforementioned projects and initiatives. This process has been made possible right from the project start, it has been intensified within the 2nd year of the project, whereas then faced some difficulties, at least for the face to face nature of it, during the Covid-19 pandemic period, in the 1st project year mainly.

The overview of the European activities in the area of autonomous/automated vehicles presented aims to disseminate the information about the existing initiatives to support and stimulate a pan European ecosystem that make use of synergies and cross-fertilising ideas among European projects/deployments addressing different research, innovation and deployment aspects for highly automated / autonomous driving.

In order to enable the transfer of knowledge, experiences and best practices among these related projects, *AI4CSM*, as one of the core project partners under the umbrella of Lighthouse mobility 4.E, has organised and participated in events and workshops to stimulate the cross-fertilisation between these projects and initiatives.

During the first and the second year of AI4CSM the project was represented at a number of events, where the main fundamental synergies with the aforementioned projects, as well as others, was established. The most notable dissemination events are illustrated in the sections below.

14th Graz Symposium Virtual Vehicle in Austria

On the 1st and 2nd of September 2021, AI4CSM was presented at the 14th Graz Symposium Virtual Vehicle (GSVF) in Austria, organized by project partner Virtual Vehicle Research GmbH and Graz University of technology. AI4CSM poster was presented in the exhibition, among other ongoing Mobility projects.

The GSVF 2021 served as a platform to discuss recent advances in systems integration and virtual validation and its optimal coexistence with physical testing. The industry currently moves away from strictly vertical to broadly horizontal vehicle system development approaches. Collaboration, virtualization, and agile-enriched processes are vital to cope with related complexity, uncertainties, quality, costs and timely delivery, to ultimately accelerate system delivery, ensuring global competitiveness and market-shares.

FIGURE 1 AI4CSM AT GSVF 2021

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EuWoRel 2021 in Germany

On the 13th-14th of October, AI4CSM was presented in the 9th European Expert Workshop on Reliability of Electronics and Smart Systems, EuWoRel 2021, in Fraunhofer-Forum, Berlin. In the presentation, results from the ECSEL project AutoDrive and Outlook on AI4CSM as a continuation were presented. Several slides are provided below.
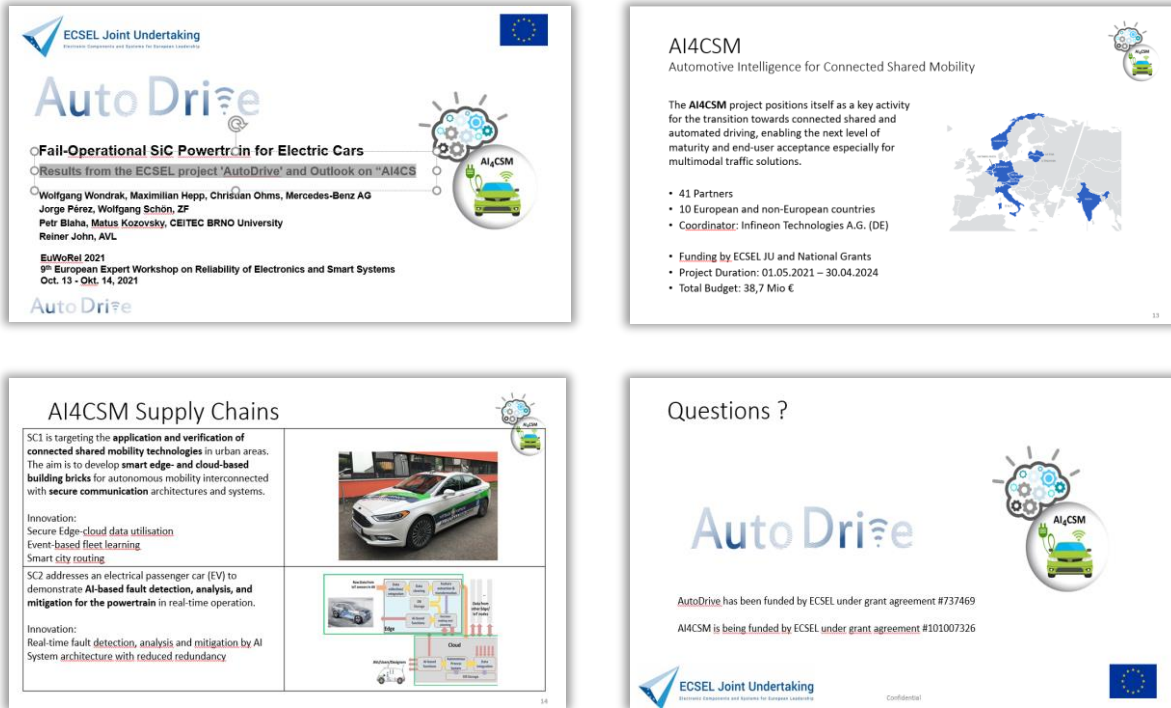

FIGURE 2 AI4CSM AT EUWOREL 2021

EFECS 2021- European Forum for Electronics and Systems

EFECS is the international forum with a focus on 'Our Digital Future' along the Electronic Components and Systems value chain in Europe. The organisers of this event, AENEAS, EPoSS, Inside Industry Association, ECSEL Joint Undertaking and the European Commission and in association with EUREKA have joined forces to bring all stakeholders together on 23-25 November 2021. EFECS 2021 gave participants a unique opportunity to engage with the leaders and enablers of Europe's Digital Economy by hosting a virtual exhibition to spaces, concentrated on learning about calls and funding landscape developments, latest technology trends and applications of Electronic Components and Systems, development of new project ideas and workshops.

AI4CSM project was represented in a virtual exhibition. The exhibition visitors could find out the main project goals, objectives, current stage and expected results. Moreover, there was an opportunity to communicate and to discuss with project partners representatives from Infineon and Teraglobus.

FIGURE 3 AI4CSM VIRTUAL BOOTH IN THE EFECS 2021

EFECS event helps to understand the challenges and to jointly develop the required roadmaps and strategic priorities addressing each key theme. EFECS encourages "cross thematic" interaction to help address innovation along the full electronic components and systems value chain and highlights key developments affecting the ECS Community. During this 3-day event, the impact and results of various European funding instruments were demonstrated and disseminated.

IFAT innovation days in Austria

On the 27th of April AI4CSM poster was presented at the internal IFAT Innovation Days 2022 in Villach, Austria. The main idea of this event was to promote Innovation activities, strengthen the innovation culture, and provide a platform for discussions and the exchange of experiences. The event was attended by more than 850 participants from various worldwide Infineon departments. AI4CSM was presented as one of the ongoing projects, coordinated by Infineon and enabling the future mobility developments following the electrification, standardisation, automatisation and digitalisation implementation strategy. The project will focus on providing new AI-enabled electronic components and systems for ECAS vehicles for advanced perception, efficient propulsion and batteries, advanced connectivity, new integration and platform concepts and intelligent components based on trustworthy AI.

FIGURE 4 AI4CSM AT IFAT INNOVATION DAYS 2022

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ECSEL JU

Microelectronics Systems Symposium

On the 1st-2nd June, 2022, AIT Austrian Institute of Technology GmbH presented the AI4CSM project at the Microelectronics Systems Symposium - MESS2022 in Vienna.

AI4CSM is about the Mobility of the future, which will let us solve global problems! Electric, Connected, Autonomous mobility build together the European approach to mitigate climate change and environmental degradation in the transport and mobility domain, thus fulfilling the goals of the European Green Deal and the implementation of the sustainable development Goals.

AI4CSM combines functional architectures, embedded intelligence and functional virtualization for connected and shared Mobility developing and using advanced electronic components, trustworthy AI for decision making, systems for advanced perception, efficient propulsion and batteries, advanced connectivity, new integration and platform concepts to make a significant step towards sustainable future.

FIGURE 5 AI4CSM AT MESS2022

15th Graz Symposium Virtual Vehicle in Austria

From the 31st of August - the 1st of September 2022, VIF presented the AI4CSM project at the 15th Graz Symposium Virtual Vehicle. The event attracted a professional audience from all over the world. The GSVF 2022 served as a platform to discuss recent advances in system integration and virtual validation and its optimal coexistence with physical testing. It mainly focused on methods, tools, data, and processes for virtual validation. The symposium thus takes current trends into account: at the moment, the industry moves away from strictly vertical to broadly horizontal vehicle system development approaches. So collaboration, virtualization, and agile-enriched processes are vital to cope with related complexity, uncertainties, quality, costs and timely delivery, to ultimately accelerate system delivery, ensuring global competitiveness and market shares.

VIF, leading the AI4CSM SC1 "Smart Connected Shared Mobility for Urban Area" is developing and applying perception and intelligence algorithms and tests its performance in a demonstrator vehicle (Ford Mondeo) and the demonstrator poster "Robo Taxi automated operation in challenging urban use cases" was presented at the event to represent expected results.
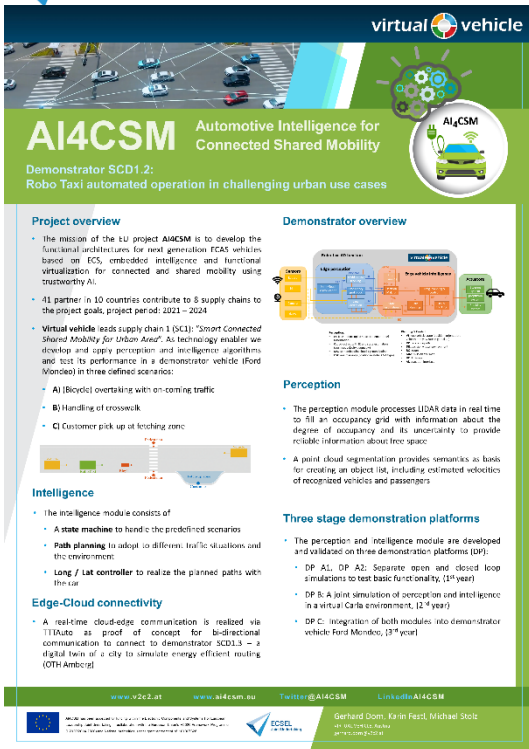
FIGURE 6 AI4CSM AT GSVF2022

The Autonomous

On the 27th of September 2022, the AI4CSM was presented at the Autonomous Main event in Vienna, where the coordinator Jochen Koszescha gave a presentation at the Spotlight Session "Research & Innovation in Autonomous and Connected Mobility".

Autonomous, Connected, and Electric mobility are recognized as the most disruptive trends in the automotive industry. Among all of them, autonomous vehicle technologies are the most heavily researched topic. The automated driving features currently available are only a fraction of what is being developed for the future. It is expected that autonomous, connected, and electric vehicles will provide significant social, industrial, economic, and environmental benefits.

The workshop presented the state-of-the-art challenges of these technologies and the R&I programs that the European Commission had set up to tackle those challenges.

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FIGURE 7 AI4CSM AT THE AUTONOMOUS

Making Industry 4.0 Real

On the 19th of October 2022, The AI4CSM was presented at the international conference – Making Industry 4.0 Real in Vilnius, Lithuania.

Making Industry 4.0 Real 2022 – a conference for representatives of engineering and other manufacturing industries, manufacturing, IT services, etc. for company managers, specialists, the general public interested in digital transformation and examples of its practical application.

Many interesting presentations and discussions about Europe's competitive edge, technological transformation and its contribution to industrial resilience and Sustainability. We are proud that by implementing the AI4CSM project, we can contribute to the creation of a cleaner and stronger Europe.

FIGURE 8 AI4CSM AT THE INDUSTRY 4.0 REAL

EFECS2022

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ECSEL JU

On 24th-25th of November 2022, after a two-year break, we again had the opportunity to participate in the live EFECS exhibition in Amsterdam and present the project to the ambitious EC's projects community. EFECS is the international forum to create impact by collaborative innovation for an autonomous and sustainable Europe along the Electronic Components and Systems value chain in Europe. The event gathered participants from the whole Europe. The AI4CSM project was represented by partners from IFAG, AIT, AVL, TeraGlobus, BUT, EDI.

At the conference in the AI4CSM booth, we had a roll-up, several posters, leaflets, branded chocolates. Furthermore, we used LCD screen to present the videos with a general AI4CSM presentation and SCs' posters.

FIGURE 9 AI4CSM AT THE EFECS 2022

The Key Digital Technologies Networking Workshop

On the 30th-31st of January 2023, Several AI4CSM partners were present at the Key Digital Technologies Networking Event, which brought together a large group of science, research, business and industry representatives to Mallorca, Spain.

We had a chance to listen to such speakers like Reiner John from AVL, Dr. Jochen Langheim from STMicroelectronics, Julián Proenza Arenas from the University of the Balearic Isl, Anton Chichkov from KDT JU, Roland Nagy from FAU Erlangen-Nürnberg, Thomas Harder from ECPE European Center for Power Electronics and Michael Saur from Mercedes-Benz AG.

Furthermore, a special Panel session about ECS Mobility was organized to discuss how the introduction of quantum technologies influences the future development of technologies in the mobility domain and what needs to be done so that power electronics and electronic components providers can meet the increasing demands and requirements of the mobility sector. In addition to this, a demonstrators session was organized, where several projects presented their physical demonstrators and videos.

FIGURE 10 AI4CSM AT THE KEY DIGITAL TECHNOLOGIES NETWORKING WORKSHOP

At future conferences or events, it is planned to present the results of the project, which will be published in scientific publications. There may be opportunities to present project demonstrators. The SC8 leader will be active in conferences related to standardization activities.

FIGURE 11 UPCOMING CONFERENCES

The consortium will make use of the dissemination activities undertaken by the EC, ECSEL JU, and EC-funded projects within Horizon2020, so as to identify potential synergies with other projects. Moreover, the following activities will form part of the project's 3rd year:

- Creation of a cross-project fertilization committee within the core team of AI4CSM

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ECSEL JU

- Selection of projects and establishment of liaision with selected projects, such as AIMS5.0
- Invitation of representatives to face to face plenary meeting of AI4CSM and potential visit to collaborating project's meetings as well
- Exchange of ideas on selected common topics
- Potential common continuation of work in specific areas

7 Conclusion

The aim of the overview was to highlight the transdisciplinary nature of **AI4CSM** project and to stimulate fostering the cross-fertilization of ideas and knowledge, for achieving innovation, producing synergies, generative inquiry and achieving praxis – knowledge, theory, application in the area of connected and shared mobility enabled by autonomous / highly automated vehicles based on fail-aware, fail-safe, and fail-operational integrated electronic components and systems.

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    a) Identification of projects that **AI4CSM** has been collaborating with
    b) Establishment of a clustering committee for those projects
    c) Organization of common meetings
    d) Participation of **AI4CSM** members in meetings of similar interest organisations, as well as large scale events, for communication among projects reflecting different perspective and solution approaches.

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List of figures

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List of tables

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