A Model-driven development framework for highly Parallel and EneRgy-Efficient computation supporting multi-criteria optimisation

D7.6 Final Communication and Dissemination Report

Version 1.0

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1. Executive Summary

Since the AMPERE project began on 1 January 2020, the dissemination team responsible for *Task 7.1 Communication and dissemination activities and tools* has actively sought to raise awareness of the project and its results by crafting a Communication and Dissemination Plan that would effectively identify target audiences and set out the most suitable channels for communicating with them. Moreover, as project results matured, the consortium sought to build a community around project results to facilitate the transfer of the knowledge and technology originating from the project. Partners targeted application domains and stakeholders and actively contributed to open communities like OpenMP, among others, to foster the integration of the project results into these community efforts.

This deliverable reports on the communication and dissemination activities undertaken by AMPERE from 1 January 2020 to 30 June 2023. It provides an exhaustive list of the events, publications, dissemination tools and channels developed for use during the project. It also includes detailed information on the AMPERE project website and social media performance, and the community building activities that will help ensure the sustainability of the project once it ends.

During the 42 months of the project, the AMPERE project consortium participated in 47 events, including presentations in conferences and workshops, co-chairing and organising workshops and hosting 1 industrial booth participation. The project also produced 25 peer-reviewed publications and was mentioned in the press 23 times.

The first year of the project was devoted to defining a dissemination and communication plan that identified and defined target audiences, messages and channels and introduced dissemination channels and tools. As the project unfolded, the consortium's dissemination activities increased, as did interest in the project and its developed technologies and solutions. Dissemination activities became more involved as the project technology matured. From initial awareness-raising to community building, to workshops on project technology and even technology transfer, the dissemination and communication of the AMPERE project reached, and even surpassed, the goals it initially set out for itself at the beginning of the project. This is notable considering that the COVID-19 pandemic altered envisioned participations in events and hampered the opportunity for in-person meetings.

Despite the initial disruption caused by the COVID-19 pandemic in terms of physical participation in events and meetings, the consortium was able to continue towards its dissemination goals, thanks in part to the project extension. The key project indicators set out at the beginning of the project have been met or will be on track to be met by the end of the project reporting period (August 2023).

Moreover, the results stemming from the AMPERE project live on in the form of technology transfer in the 'Reliable Heterogeneous Parallelism for Embedded Critical Systems' (RESPECT) project, funded by the Department of Research and Universities of the Generalitat de Catalunya and the EU-funded 'Distributed Data-mining Software Platform for EXTReme dAta Across the Compute Continuum' (EXTRACT) project. More generally, these results are embedded in the technologies developed by each partner and described in deliverable *D7.7 Final Exploitation Report*.

The dissemination team has successfully carried out the activities set out in deliverable *D7.1 Communication and Dissemination Plan* and the project´s description of action (DoA).

2. Introduction

This deliverable, *D7.6 Final Communication and Dissemination Report*, provides a comprehensive overview of the dissemination activities undertaken within the lifetime of the AMPERE project to increase the impact of the project. This report addresses the requirements set out in the description of action and the *D7.1 Communication and Dissemination Plan*. The second deliverable, *D7.2 Initial Communication and*

Dissemination Report, provided an update on the actions after one year of the project, and the third dissemination deliverable, *D7.6 Intermediate Communication and Dissemination Report*, provided an account of the project at year two. This final deliverable showcases the major accomplishments of the communication and dissemination task throughout the life of the project and highlights the activities that served as key project indicators and success stories. Moreover, it provides a detailed breakdown of the status of the website and social media analytics to show the increase in engagement throughout the project.

The main goal of WP7 (Communication, Dissemination and Exploitation) has been to maximise the visibility of the project and to transfer the knowledge and technology created in the project. To achieve this goal, WP 7 worked to:

- raise awareness about the project and its results, reinforcing the message that AMPERE plays a key role in building European expertise in the design of dependable and physically entangled systems and bolstering competitiveness in productive parallel programming
- Update key stakeholders on project progress
- Build a community around the AMPERE technology

Constant engagement with research and industrial stakeholder communities through the dissemination activities defined at the project´s onset, and those that arose over the course of the project, allowed the AMPERE project to build a recognizable presence. Valuable academic and industrial contributions made the project a source of reliable and useful technical information. Dissemination and communication activities harmoniously developed along with exploitation activities in this project. The final exploitation report and the roadmap can be found in deliverables *D7.7 Final exploitation report* and *D7.8 AMPERE Roadmap*.

3. Corporate image

D7.1 Communication and Dissemination Plan defined a common graphic identity to ensure a cohesive and recognizable brand that is associated with the project. It has been correctly implemented by all partners during the project.

A brand guide was developed and served as the point of reference for the AMPERE brand, including the use of the logos, colour palette, font size and typography. The brand guide was made available for download on the intranet for all partners to access and use accordingly.

4. Dissemination channels and tools

To ensure that the project and its results were disseminated widely, five main dissemination channels were identified: the project website, the two social media channels, events and publications. These channels conveyed information about the AMPERE project results to the different target audiences identified in D7.1 Communication and Dissemination Plan.

4.1 Website (https://ampere-euproject.eu/)

The AMPERE project website has played a central role in the dissemination and communication of the project´s information and results. It has been active since the beginning of the project and includes updated and relevant information on events, publications and news, as well as the approved versions of the public deliverables. Greater dissemination of AMPERE project results and engagement among users has also been recorded by increasing visits to the project website. Figure 1 highlights the user sessions of the AMPERE website since the project´s inception.

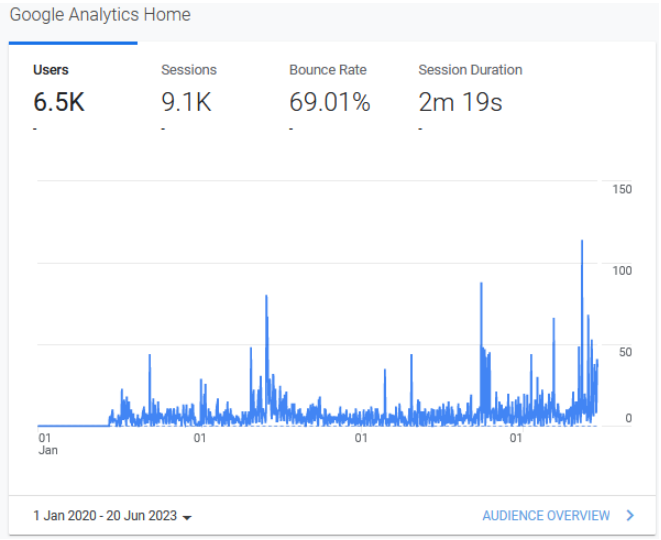


Figure 1 AMPERE website sessions since the beginning of the project (1 January 2020-21 June 2023)

Google Analytics has been used to monitor the number of project website users and sessions, the type and duration of engagement, and visitor background since the beginning of the project. The session number shows all accesses to the web, while the user number counts unique visitors, that is, new visits to the website. As shown in Figure 1, user sessions have reached 6.500 unique sessions and 9,100 total sessions. **The final number of unique users surpasses our key project indicator (KPI) of 1,000 unique sessions per year (4,000 total).** This impressive user number suggests that strategy to keep the project website updated with new information, events, and publications has paid off. The website has had steady visitors during the complete project.

Figure 1 also illustrates the change in sessions from the beginning of the project to the time of writing. Visits to the project website have remained steady throughout the project with peaks in users that correspond with key dissemination activities like participation in the Smart City World Expo, the Taskgraph Framework press release, Ada-Europe Conference, and the AMPERE final event. Reporting on these events helped generate more interest in the project and its results and added more traffic to the project website.

The most popular pages on the AMPERE project website are shown in Table 1. Most of the views are on the home page, which provides users with an overview of the project and highlights specific news pieces or events that are constantly updated, as well as the first project video. The second most visited page is the news section, followed by that of the use cases. News pieces are updated at least once a month and they provide users with an overview of specific project results, information on events the project participated in, and links to project presentations and slides. This allows users to access the latest updates of the project in a fast and clear way. Visits to the use cases page offers website visitors more information on the industrial applications of the AMPERE project technology.

Number and percentage of AMPERE project website visits	
Page	**Page Views**
Home	5390 (24,70%)
Media / news	1397 (6,40%)
Use-cases	775 (3,55%)

Events	740 (3,39%)
Results / publications	678 (3,11%)

Table 1 Most visited pages of the AMPERE project website

Website users come from all over the world. Table 2 below shows a breakdown of the top ten countries from where visitors originate. Most of the sessions are from the United States, however China becomes the second source of users substantially ahead of sessions above European countries such as Spain, Germany, Italy or France. One explanation for the exceptionally high number of sessions from the USA could be due to the origin of one the main communities around the AMPERE project, OpenMP, which registered in the USA. The diverse background of the session users speaks to the importance of this topic across borders.

Country	Acquisition			Behaviour	
	Users	New Users	Sessions	Bounce Rate	Pages/Session
	6,079 % of Total: 100.00% (6,079)	6,164 % of Total: 100.00% (6,164)	8,751 % of Total: 100.00% (8,751)	68.84% Avg for View: 68.84% (0.00%)	2.49 Avg for View: 2.49 (0.00%)
1. United States	**1,018** (16.40%)	1,017 (16.50%)	1,057 (12.08%)	92.72%	1.21
2. China	**948** (15.28%)	947 (15.36%)	961 (10.98%)	98.44%	1.02
3. Spain	**692** (11.15%)	686 (11.13%)	2,367 (27.05%)	34.73%	5.02
4. Germany	**584** (9.41%)	579 (9.39%)	831 (9.50%)	68.83%	2.15
5. Italy	**486** (7.83%)	482 (7.82%)	719 (8.22%)	65.92%	2.21
6. France	**434** (6.99%)	428 (6.94%)	491 (5.61%)	70.47%	1.76

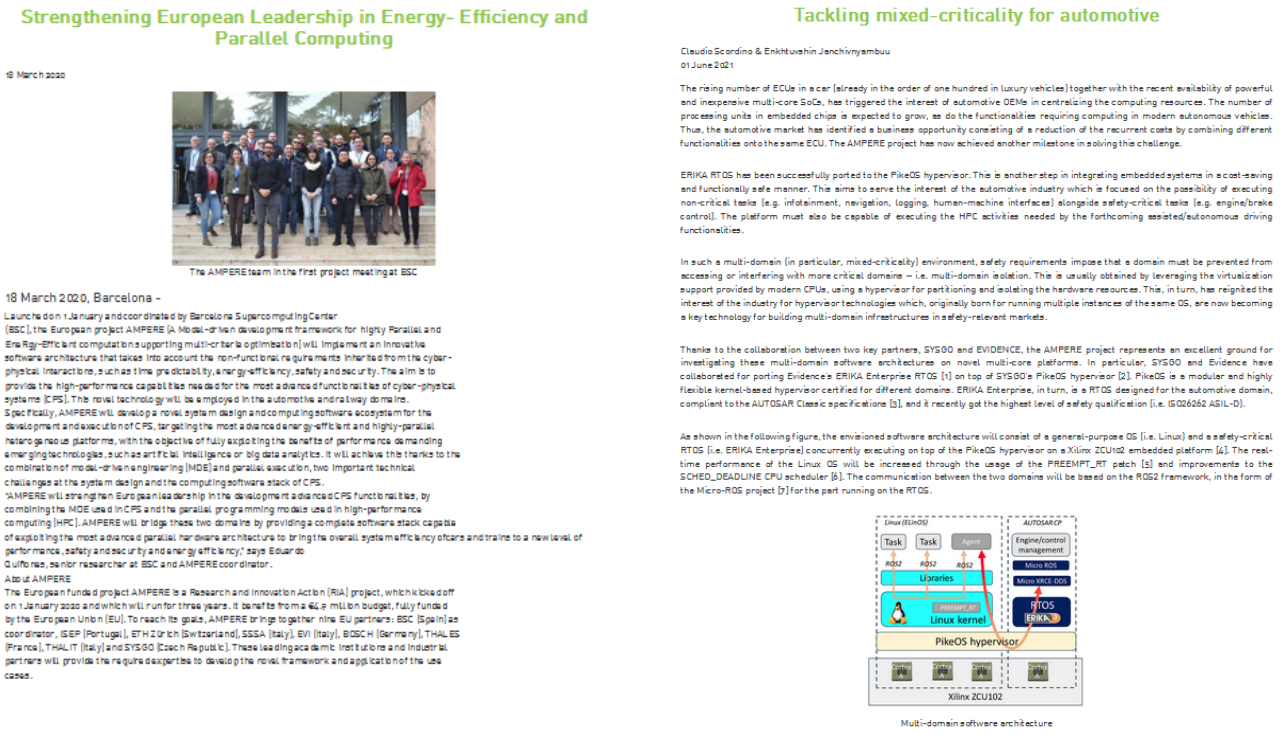
Table 2 Sessions on the AMPERE project website by country, M1-M42

It is worth noting that these users mainly come from a direct source (60% with link) while the organic search from the search engine represents 31% of the users' acquisition. This direct source access may be due to a variety of factors, including the success of the dissemination tools such as flyers or even mails and press releases to easily direct users to the webpage. Google Analytics data also shows that females represent 30% of AMPERE website users and that the most frequent users are 25 years to 44 years old. Users younger than 24 years old represent a bit more than the 21% of all users.

4.1.1 News pieces

Throughout the life of the project, the T7.1 team worked to ensure that updated and relevant content was available on the website. The dissemination team prepared editorial guidelines, including an editorial calendar to plan partner contributions and to vary the content available to website users. Partners were asked to contribute information on the work that they were undertaking and how it related to the greater project goals. This allowed the website audience to have a deeper understanding of the project´s components and the role of the different partners in the project. The dissemination team also reported on events the consortium participated in, publications that were accepted, and the workshops and industrial events where the AMPERE project presented its results.

These news pieces helped drive traffic to the website and to provide content to share on social media channels to increase the number of followers and their engagement. Since the project´s beginning, 45 project-related news pieces have appeared on the AMPERE news page. At the time of writing, the initial press release announcing the launch of the project, 'Strengthening European Leadership in Energy-Efficiency and Parallel Computing' and the news piece 'Tackling mixed-criticality for automotive' were the most visited news pieces on the AMPERE project website. These two news pieces represent a good example of the types of pieces the WP7 team sought to highlight during the project: 1 is oriented to a more general audience (press release), while the other goes into greater details on the solutions AMPERE technology provides, geared toward the automotive industry. Both texts help advance AMPERE dissemination goals in different ways.



Strengthening European Leadership in Energy- Efficiency and Parallel Computing

18 March 2020

The AMPERE team in the first project meeting at BSC

18 March 2020, Barcelona -

Launched on 1 January and coordinated by Barcelona Supercomputing Center (BSC), the European project AMPERE (A Model-driven development framework for highly Parallel and Energy-Efficient computation supporting multi-criteria optimisation) will implement an innovative software architecture that takes into account the non-functional requirements inherited from the cyber-physical interactions, such as time predictability, energy-efficiency, safety and security. The aim is to provide the high-performance capabilities needed for the most advanced functionalities of cyber-physical systems (CPS). The novel technology will be employed in the automotive and railway domains.

Specifically, AMPERE will develop a novel system design and computing software ecosystem for the development and execution of CPS, targeting the most advanced energy-efficient and highly-parallel heterogeneous platforms, with the objective of fully exploiting the benefits of performance demanding emerging technologies, such as artificial intelligence or big data analytics. It will achieve this thanks to the combination of model-driven engineering (MDE) and parallel execution, two important technical challenges at the system design and the computing software stack of CPS.

'AMPERE will strengthen European leadership in the development advanced CPS functionalities, by combining the MDE used in CPS and the parallel programming models used in high-performance computing (HPC). AMPERE will bridge these two domains by providing a complete software stack capable of exploiting the most advanced parallel hardware architectures to bring the overall system efficiency of cars and trains to a new level of performance, safety and security and energy efficiency,' says Eduardo Quiñones, senior researcher at BSC and AMPERE coordinator.

About AMPERE

The European funded project AMPERE is a Research and Innovation Action (RIA) project, which kicked off on 1 January 2020 and which will run for three years. It benefits from a €4.8 million budget, fully funded by the European Union (EU). To reach its goals, AMPERE brings together nine EU partners: BSC (Spain) as coordinator, ISEP (Portugal), ETH Zürich (Switzerland), SSSA (Italy), EVI (Italy), BOSCH (Germany), THALES (France), THALIT (Italy) and SYSGO (Czech Republic). These leading academic institutions and industrial partners will provide the require dexpertise to develop the novel framework and application of the use cases.

Tackling mixed-criticality for automotive

Claudio Scordino & Enkhtuvshin Janchivnyambuu
01 June 2021

The rising number of ECUs in a car (already in the order of one hundred in luxury vehicles) together with the recent availability of powerful and inexpensive multi-core SoCs, has triggered the interest of automotive OEMs in centralizing the computing resources. The number of processing units in embedded chips is expected to grow, as do the functionalities requiring computing in modern autonomous vehicles. Thus, the automotive market has identified a business opportunity consisting of a reduction of the recurrent costs by combining different functionalities onto the same ECU. The AMPERE project has now achieved another milestone in solving this challenge.

ERIKA RTOS has been successfully ported to the PikeOS hypervisor. This is another step in integrating embedded systems in a cost-saving and functionally safe manner. This aims to serve the interest of the automotive industry which is focused on the possibility of executing non-critical tasks (e.g. infotainment, navigation, logging, human-machine interfaces) alongside safety-critical tasks (e.g. engine/brake control). The platform must also be capable of executing the HPC activities needed by the forthcoming assisted/autonomous driving functionalities.

In such a multi-domain (in particular, mixed-criticality) environment, safety requirements impose that a domain must be prevented from accessing or interfering with more critical domains – i.e. multi-domain isolation. This is usually obtained by leveraging the virtualization support provided by modern CPUs, using a hypervisor for partitioning and isolating the hardware resources. This, in turn, has reignited the interest of the industry for hypervisor technologies which, originally born for running multiple instances of the same OS, are now becoming a key technology for building multi-domain infrastructures in safety-relevant markets.

Thanks to the collaboration between two key partners, SYSGO and EVIDENCE, the AMPERE project represents an excellent ground for investigating these multi-domain software architectures on novel multi-core platforms. In particular, SYSGO and Evidence have collaborated for porting Evidence's ERIKA Enterprise RTOS [1] on top of SYSGO's PikeOS hypervisor [2]. PikeOS is a modular and highly flexible kernel-based hypervisor certified for different domains. ERIKA Enterprise, in turn, is a RTOS designed for the automotive domain, compliant to the AUTOSAR Classic specifications [3], and it recently got the highest level of safety qualification [i.e. ISO26262 ASIL-D].

As shown in the following figure, the envisioned software architecture will consist of a general-purpose OS (i.e. Linux) and a safety-critical RTOS (i.e. ERIKA Enterprise) concurrently executing on top of the PikeOS hypervisor on a Xilinx ZCU102 embedded platform [4]. The real-time performance of the Linux OS will be increased through the usage of the PREEMPT_RT patch [5] and improvements to the SCHED_DEADLINE CPU scheduler [6]. The communication between the two domains will be based on the ROS2 framework, in the form of the Micro-ROS project [7] for the part running on the RTOS.

Multi-domain software architecture

Figure 2 Most-visited news pieces on the AMPERE website

4.2 Social Media

The dissemination team used social media to draw attention to the website and to stay up to date with the latest developments in the research and industrial communities. Each time a news piece or publication was added to the AMPERE project website, the dissemination team ensured that there was corresponding social media that summarised the addition to the website, and that linked back to the website with more information.

To stay informed of new developments, the dissemination team monitored content published using the following hashtags: #CPS #researchtech #MDE #HPC #softwarecosystem #parallelprogramming #softwarestack #energyefficiency #safetyandsecurity. In this way, the AMPERE project was able to stay abreast of what other EU projects, industrial and research stakeholders and the general public were engaging with. Moreover, many partners took advantage of the project's social media channels to announce calls for papers, their participation in relevant events, and to engage with stakeholders from the

open community stakeholder groups. Throughout the life of the project, the AMPERE project was able to amass 601 social media followers from Twitter and LinkedIn.

4.2.1 Twitter

Tweets and retweets were posted several times a week. In addition to highlighting specific AMPERE project results, tweets are also posted about topics that are of interest to the AMPERE target audience. These topics include events, conferences, calls for papers, EU-relevant posts, embedded computing, edge computing, automotive and rail, OpenMP, women in science, etc.

Figure 3 The AMPERE project Twitter account and followers

The AMPERE Twitter account has 344 followers and more than 7,200 impressions. This is a 77% increase in terms of followers since the reporting done in D7.4, at which point the project had 250 followers. The number of followers has increased as the project has developed more news and technical information and has participated in more events. One explanation for this impressive growth in followers may be due to the especially high participation in dissemination activities in the last six months, including hosting workshops, publishing results and reaching out to the communities of interest.

The tweets that achieved the most engagement were those related to events and activities the consortium have been part of, such as participations in workshops, or through social media campaigns such as International Women's Day, through the #Embrace Equity.

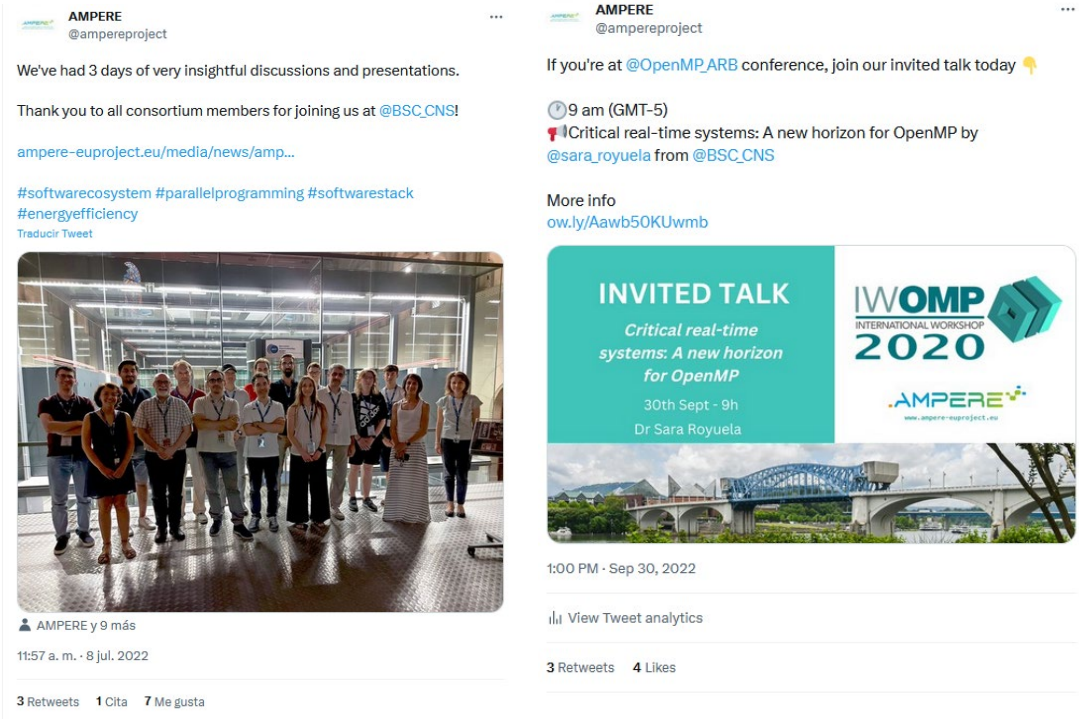


Figure 4 An extract of tweet examples with high engagement numbers

4.2.2 LinkedIn

The AMPERE project LinkedIn page provides members of the professional and technical community with more in-depth information about dissemination activities and outreach. Its longer word allowance makes it a dynamic channel where more details can be given to the professional community following the AMPERE LinkedIn account.

LinkedIn posts are published on project news and updates, events, and developments in technical fields related to the project. Visitors to this page have shown interest in AMPERE technical news and in the specific dissemination activities undertaken by individual consortium partners.

The AMPERE LinkedIn page has a total of 257 followers. The professional background of these followers is mostly engineering (21.5%), education and research (16.1%) and business development (5.5%). A breakdown of follower demographics is shown in Figure 5.

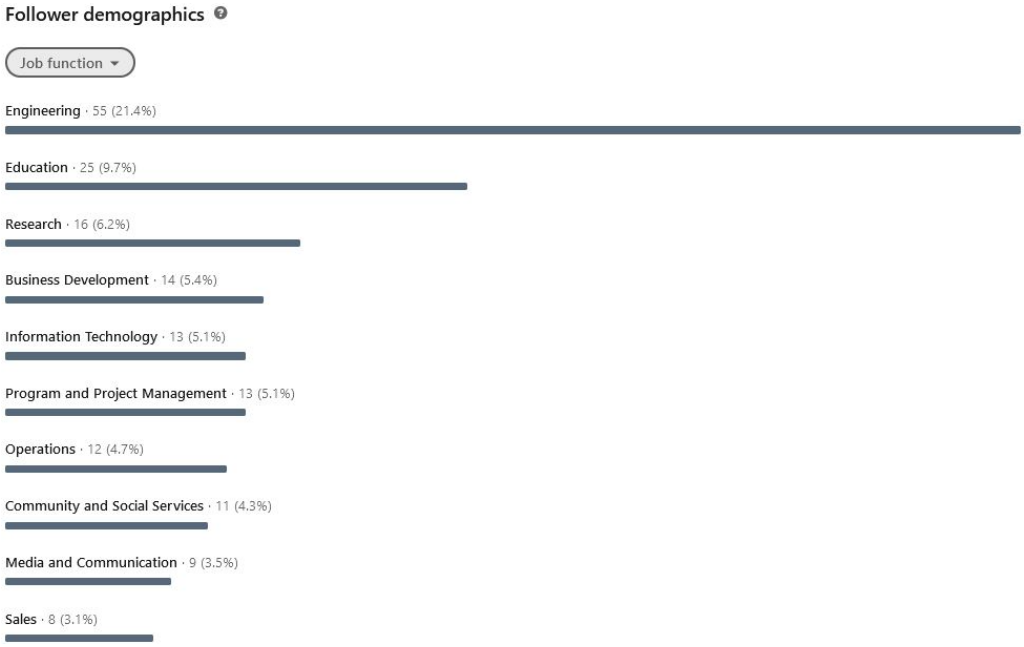


Figure 5 AMPERE LinkedIn follower demographics

These demographics positively reflect the dissemination strategy pursued by the AMPERE project. The high proportion of followers with engineering background suggests a successful transmission of the message that the AMPERE software benefits software developers by providing innovative programming methods and tools that increase software development productivity. Given the importance of this project as a stepping stone for future research, it is also encouraging that followers with a background in education and research are interested in the information available via the AMPERE LinkedIn page. Throughout the project, the AMPERE project has sought to highlight its important work on creating new research on the parallel execution in the context of embedded systems. Moreover, the fact that businesses are interested in project suggests that the strategy is working to highlight the importance of project results for the greater efficiency and reliability in a range of sectors and the opportunities for new business opportunities.

Partners have also been encouraged to use their institutional and personal accounts to promote the project. This helped bring awareness of the project through personal professional networks. For example, AMPERE partner Tommaso Cucinotta from Scuola Superiore Sant'Anna (SSSA) shared information on his latest presentation at the Power Management and Scheduling in the Linux Kernel (OSPM) Summit 2023 in Ancona, Italy, which yielded many impressions. The post received more than 60 reactions.

Figure 6 LinkedIn message about the OSPM Summit 2023

4.2.3 Social Media Key Project Indicators (KPIs)

Throughout the life of the project, AMPERE social media followers have steadily increased (Table 4). As the project has produced more results and participated in more events, so too has interest in the project increased. In addition, the editorial calendar prepared as part of *D7.1 Communication and Dissemination Plan 1*, and partner's contributions from their own accounts, helped ensure that fresh and relevant content was available and could be shared via social media.

Social Media	Key Project Indicator	Followers (June 2022)	Followers (June 2023)
Twitter	250	250	344
LinkedIn	150	207	257

Table 3 Change in AMPERE social media followers during the period June 2022- June 2023

Twitter and LinkedIn provided important channels through which to disseminate AMPERE project results. In addition to attracting target audiences to the website, the project also used these channels to build a community around project results. Follower demographics and final KPIs suggest that these channels achieved their proposed objectives.

4.3 Dissemination materials

Dissemination materials and templates were prepared for use by all project partners. Presentation, poster and word document templates served to provide project partners with basic documents that could be used in a variety of settings while maintaining the project´s visual identity and ensuring the proper use of partner logos and EU-funding acknowledgement. Flyers, posters and videos were also prepared to help present project results. All templates and dissemination materials were made available to all partners via the

internal project repository. The KPI on dissemination materials (2 posters and 2 videos) was met thanks to the activities described below.

4.3.1 Flyer

Two AMPERE flyers were created for the project. The first was provided at the beginning of the project to provide an overview of the project's objectives, main features, partners and contact channels. It was mainly used during the first phase of the project that focused on raising awareness about the project. The second flyer was created to provide more information about the AMPERE project technology. It included an excerpt of the software architecture and the two use cases, as well as a general overview of the project's objectives, partners, funding and contact channels. The flyer has been used in several events, including the Smart City World Expo (20,000 attendees), HiPEAC 2023 Workshop on Adaptive CPSoS and the ISC High Performance 2023 event (2000 attendees). Both flyers followed a double-sided A5 format. Partners had access to both versions of the high-resolution flyer via the internal project repository. It was printed with the intention of its being distributed in events or local actions defined by each partner. The updated flyer is also available for download on the AMPERE branding web page.

4.3.2 Posters

An initial poster template was provided as part of the initial project materials. It provided a basic layout template, which the partners could edit and tailor depending on their needs. Two AMPERE posters were prepared and used to present at HiPEAC (January 2022) and ISC (2022) HPC events.

4.3.3 Project videos

The AMPERE project produced two official videos. The introductory video was created in March 2021 and had 280 views on the BSC YouTube channel. This animated video introduced the goals of the AMPERE project and explained the existing gap that the AMPERE project sought out to address. It explained the benefits the AMPERE project technology would have for developers who struggled with the complexity of cyber-physical systems and non-functional requirements.

Figure 7 Screenshot of AMPERE project video, 'Overcoming the challenges of developing traditional cyber-physical systems'

A final AMPERE project video was published on 23 June 2023. It is hosted on the Barcelona Supercomputing Center´s YouTube channel because this channel has a high number of followers. The video is embedded on

the homepage of the AMPERE project website. The video wraps up the outcomes of the AMPERE project and highlights the importance of the project for developers and industry. Industrial partners BOSCH and THALES provided testimonials citing the benefits of AMPERE technology for stringent safety and real-time requirements and its use in the operation of real cases, such as automotive predictive cruise control and the Florence tramway.

Figure 8 Screenshot of AMPERE final video

4.4 Press

To date, the AMPERE project appeared in 23 different media in the form of press clippings. These press clippings were updated on the Press clippings web page of the project website with links to the media that mentioned it (Figure 8 shows an extract of the webpage). Press clippings occurred as the result of press releases launched as part of the dissemination strategy. Press releases are one of the most effective ways of communicating AMPERE project results to specific technical target audiences and of amplifying the message about project results to other stakeholders.

An initial press release was launched at the beginning of the project resulting in more than 16 press clippings. A second press release was sent in May 2023 announcing the important development of the OpenMP-compliant task-dependency graph-based framework called Taskgraph. Two important technical media, HPC Wire and IK APK picked up the news piece. The second press release was especially important because it brought attention to an important project achievement.

TITLE	MEDIA	PUBLICATION DATE
AMPERE-developed Taskgraph Framework Enhances Programmability and Performance for Rail and Automotive Industries	HPC Wire	30 May 2023
Taskgraph Framework developed by AMPERE improves programmability and performance for the railway and automotive industries	IK APK	30 May 2023
AMPERE and SENATE: Success Stories in the Spotlight	ARTEMIS Industry Association	11 May 2021
CLASS coordinator Eduardo Quiñones interview with Scientific Computing World	Big Data Value	29 March 2021
AMPERE: Overcoming the challenges of developing traditional cyber-physical systems	Cordis	12 March 2021
Edge productivity	Scientific Computing World	02 March 2021
BSC programming model OmpSs is driving energy efficiency on heterogeneous compute devices	BSC	18 January 2021

Table 4 Extract of AMPERE press clippings web page

The dissemination team released two of the three press releases set out in the KPIs. A final press release highlighting the main successes of the project will be published at the end of June 2023 once the final results are published and consolidated.

4.5 Events

Although the COVID-19 health crisis momentarily put a pause on some in-person activities, the AMPERE project was able to keep its participation in events high thanks to digital alternatives. Moreover, once pandemic concerns decreased, partners became especially active in building a community around results through workshops and participating in high-level conferences in the field of Cyber Physical Systems, HPC, Internet of Things, embedded systems, automation, OpenMP, etc.

The consortium has attended a total of 47 events since the beginning of the project. These participations include conferences, keynotes, workshops, booths, and meetings. The full list of events that AMPERE partners attended can be found on the project´s Events page and in the dissemination register that can be found in Annex 1 of this document. These events addressed many of the target audiences. Conferences helped raise awareness of the AMPERE project and its technologies, while workshops were crucial for providing more in-depth and hands-on approaches to specific AMPERE technologies. The dissemination register in Annex 1 provides a detailed list of the activities undertaken by all partners within the framework of the AMPERE project.

4.5.1 Highlighted events

Several events that deserve special mention because of their especially large impact, reach, and relationship to the key project indicators:

- HIPEAC 22 (June 2022): AMPERE had a strong presence in the premier European forum for experts in computer architecture, programming models, compilers and operating systems for embedded and cyber-physical systems
    - SSSA and BOSCH jointly presented at the FORECAST 2022 workshop on Functional Properties and Dependability in Cyber-Physical Systems
    - BSC and ISEP co-chaired the 'STEADINESS: System Enginnering and Dependability in Cyber-Physical Systems' workshop
- 17th Workshop on Virtualization in High-Performance Cloud Computing (June 2022): AMPERE partner SSSA co-chaired the '17th Workshop on Virtualization in High--Performance Cloud Computing' as part of the ISC 22 Conference in Hamburg
- Ada-Europe International Conference on Reliable Software Technologies (June 2022)
    - ISEP paper 'Tracing and Measuring GPU Execution in Automotive Software Systems'
    - BSC chaired 'Technical Session 5: Special-Purpose Systems' and presented the BSC-BOSCH paper 'Increasing CPS Productivity and Resiliency through Accelerated Software Replication' in 'Technical Session 4: Advanced Systems'
    - AMPERE co-organised the workshop 'Challenges and new Approaches for Dependable and Cyber-Physical Systems Engineering'
- Booth at Smart City World Expo: world's biggest and most influential event on urban innovation, more than 20,000 attendees, general public, industry, EU-projects. BSC hosted an AMPERE booth and received accolades from the local government of Catalunya.
- HIPEAC 23 (January 2023): AMPERE participated in the Workshop on Adaptive Cyber Physical Systems of Systems in the premier European forum for experts in computer architecture, programming models, compilers and operating systems for embedded and cyber-physical systems
- 18th Workshop on Virtualization in High-Performance Cloud Computing (May 2023): AMPERE sponsored this workshop that was co-located within the ISC 2023 High Performance Computing Conference in Hamburg.
    - Invited talk given by SSSA on 'Virtualization and Power Optimization of Embedded HPC Applications in AMPERE'
- The 27th Ada-Europe International Conference on Reliable Software Technologies (June 2023)
    - Presentation during *Session 3: Reliability and performance,* 'Towards Reliable Distributed Edge-Cloud Applications' (BOSCH)
    - Presentations during *Session 6: Real-time systems,* 'Time-Predictable Task-to-Thread Mapping in Multi Core Processors' (ISEP and BSC); 'Fine-grained adaptive parallelism for automotive systems through AMALTHEA and OpenMP' (BSC and BOSCH)
    - Co-located workshop within the 27th Ada-Europe Conference: 'Challenges and New Approaches for Dependable and Cyber-Physical System Engineering' (BSC, ISEP, SSSA, ETHZ)

4.5.2 Final event

The AMPERE final event, hosted via webinar by HiPEAC took place on 27 June from 10am-1pm. The AMPERE consortium showcased the project's achievements and presented its innovative software architecture that can implement advanced cyber physical systems. Partners BOSCH and Thales explained how they evaluate AMPERE technology in key industrial sectors like rail and automotive. Consortium partners explained the technology behind the AMPERE software framework, including HPC programming models for predictable

parallel performance, non-functional requirements, resiliency, Real-Time Operating Systems (RTOS) & Hypervisors, Robot Operating System (ROS) communication and the Open-ERIKA project. Attendees asked project partners specific questions about the project and AMPERE technology, contributing to an interactive session. Partnering with HiPEAC offered greater visibility for the event. In all, fifty-five attendees from twenty institutions in twelve countries registered for the webinar. The webinar was recorded and will be made public by the end of June 2023.

Figure 9 AMPERE Final event flyer

4.6 Publications

Twenty-five peer-reviewed articles or conference proceedings have been published as part of the AMPERE project. These publications are all OpenAccess via Gold or Green route. Full details on AMPERE publications can be found on the AMPERE publications page and in Table 5. Moreover, five AMPERE project papers have been accepted and are pending publications. Full details on these pending publications can be found in Table 6.

AMPERE project peer-reviewed publications					
No.	**Type of Scientific Publication**	**Title**	**Authors**	**Journal or equv.**	**Year**
1	Publication in Conference Proceedings / Workshops	OpenMP static TDG runtime implementation and its usage in Heterogeneous Computing.	Chenle Yu, Sara Royuela Alcazar, Eduardo Quiñones	7th BSC Severo Ochoa Doctoral Symposium, Spring 2020	2020
2	Publication in Conference Proceedings / Workshops	A Model-driven development framework for highly Parallel and EneRgy-Efficient computation supporting multi-criteria optimization	Eduardo Quiñones, Sara Royuela, Claudio Scordino, Paolo Gai, Luis Miguel Pinho, Luis Nogueira, Jan Rollo, Tommaso Cucinotta, Alessandro Biondi, Arne Hamann, Dirk Ziegenbein, Hadi Saoud, Romain	23rd International Symposium on Real-Time Distributed Computing (ISORC)	2020

			Soulat, Björn Forsberg, Luca Benini, Gianluca Mando, Luigi Rucher		
3	Publication in Conference Proceedings / Workshops	OpenMP to CUDA graphs: a compiler-based transformation to enhance the programmability of NVIDIA devices	Chenle Yu, Sara Royuela Alcazar, Eduardo Quiñones	23th International Workshop on Software and Compilers for Embedded Systems (SCOPES)	2020
4	Publication in Conference Proceedings / Workshops	A Synergistic Approach to Predictable Compilation and Scheduling on Commodity Multi-Cores	Björn Forsberg, Maxim Mattheeuws, Andreas Kurth, Andrea Marongiu, Luca Benini	The 21st ACM SIGPLAN/SIGBED Conference on Languages, Compilers, and Tools for Embedded Systems	2020
5	Journal Article	EDF scheduling of real-time tasks on multiple cores: adaptive partitioning vs. global scheduling	Luca Abeni, Tommaso Cucinotta	ACM SIGAPP Applied Computing Review Volume 20 issue 2	2020
6	Journal Article	A Toolchain to Verify the Parallelization of OmpSs-2 Applications	Simone Economo, Sara Royuela, Eduard Ayguadé, Vicenç Beltran	Lecture Notes in Computer Science	2020
7	Publication in Conference Proceedings / Workshops	XPySom: High-Performance Self-Organizing Maps	Riccardo Mancini, Antonio Ritacco, Giacomo Lanciano, Tommaso Cucinotta	2020 IEEE 32nd International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD)	2020
8	Publication in Conference Proceedings / Workshops	Building End-to-End IoT Applications with QoS Guarantees	Arne Hamann, Selma Saidi, David Ginthoer, Christian Wietfeld, Dirk Ziegenbein	2020 57th ACM/IEEE Design Automation Conference (DAC)	2020
9	Publication in Conference Proceedings / Workshops	Static Analysis to Enhance Programmability and Performance in OmpSs-2	Adrian Munera, Sara Royuela, Roger Ferrer, Raul Peñacoba, Eduardo Quiñones.	ISC High Performance 2020 International Workshops	2020
10	Journal Article	The OpenMP API for High Integrity Systems: Moving Responsibility from Users to Vendors	Michael Klemm, Eduardo Quiñones, Tucker Taft, Dirk Ziegenbein, Sara Royuela	ACM SIGAda Ada Letters, Volume 40, Issue 2.	2020
11	Journal Article	Real-time Issues in the Ada Parallel Model with OpenMP	Luis Miguel Pinho, Sara Royuela Alcázar, and Eduardo Quiñones	"ACM SIGAda Ada Letters", 2021, vol. 40, núm. 2.	2020
12	Publication in Conference	Migrating Constant Bandwidth Servers on Multi-Cores	Tommaso Cucinotta and Luca Abeni	Proceedings of the 29th International	2021

	Proceedings / Workshops			Conference on Real-Time Networks and Systems (RTNS 2021)	
13	Publication in Conference Proceedings / Workshops	Learning based Memory Interference Prediction for Co-running Applications on Multi-Cores	Ahsan Saeed, Daniel Mueller-Gritschneder, Falk Rehm, Arne Hamann, Dirk Ziegenbein, Ulf Schlichtmann, Andreas Gerstlauer	2021 ACM/IEEE 3rd Workshop on Machine Learning for CAD (MLCAD)	2021
14	Publication in Conference Proceedings / Workshops	Enhancing OpenMP Tasking Model: Performance and Portability	Chenle Yu, Sara Royuela, Eduardo Quiñones	17th International Workshop on OpenMP, IWOMP 2021	2021
15	Journal Article	Dynamic partitioned scheduling of real-time tasks on ARM big.LITTLE architectures	Agostino Mascitti, Tommaso Cucinotta, Mauro Marinoni, Luca Abeni,	Elsevier Journal of Systems and Software (JSS), Vol. 173, March 2021.	2021
16	Publication in Conference Proceedings / Workshops	Automating the design flow under dynamic partial reconfiguration for hardware-software co-design in FPGA SoC	Biruk Seyoum, Alessandro Biondi, Marco Pagani, and Giorgio Buttazzo	36th ACM/SIGAPP Symposium on Applied Computing (SAC 2021)	2021
17	Publication in Conference Proceedings / Workshops	An Evaluation of Adaptive Partitioning of Real-time Workloads of Linux	Tommaso Cucinotta, Luca Abeni, D.B. de Oliveira	Proceedings of the 24th IEEE International Symposium on Real-Time Distributed Computing	2021
18	Journal Article	Performance modeling of Heterogeneous HW Platforms	Falk Rehm, Dakshina Dasari, Arne Hamann, Michael Pressler, Dirk Ziegenbein, Joerg Seitter, Ignacio Sanudo, Capodieci Nicola, Paolo Burgio, Marko Bertogna	Microprocessors and Microsystems (MICPRO)	2021
19	Publication in Conference Proceedings/Workshops	Heuristic-based Task-to-Thread Mapping in Multi-Core Processors	M. Samadi Gharajeh, S. Royuela, L. Miguel Pinho, T. Carvalho and E. Quiñones	2022 IEEE 27th International Conference on Emerging Technologies and Factory Automation (ETFA)	2022
20	Publication in Conference Proceedings/Workshops	Memory Utilization-Based Dynamic Bandwidth Regulation for Temporal Isolation in Multi-Cores	Ahsan Saeed, Dakshina Dasari, Dirk Ziegenbein, Varun Rajasekaran, Falk Rehm, Michael Pressler, Arne Hamann, Daniel Mueller-Gritschneder, Andreas Gerstlauer, Ulf Schlictmann	2022 IEEE 28th Real-Time and Embedded Technology and Applications Symposium (RTAS)	2022

21	Publication in Conference Proceedings/Workshops	A Data-Driven Approach to Lightweight DVFS-Aware Counter-based Power Modeling for Heterogeneous Platforms	Sergio Mazzola, Thomas Benz, Björn Forsberg, Luca Benini	SAMOS 2022 Lecture Notes in Computer Science vol 13511	2022
22	Publication in Conference Proceedings/Workshops	SNE: an Energy-Proportional Digital Accelerator for Sparse Event-Based Convolutions	Alfio Di Mauro; Arpan Suravi Prasad; Zhikai Huang; Matteo Spallanzani; Francesco Conti; Luca Benini	2022 Design, Automation & Test in Europe Conference & Exhibition (DATE)	2022
23	Publication in Conference Proceedings / Workshops	Simulating Execution Time and Power Consumption of Real-Time Tasks on Embedded Platforms	Gabriele Ara, Tommaso Cucinotta, Agostino Mascitti	Proceedings of the 37th ACM/SIGAPP International Symposium on Applied Compputing (ACM SAC 2022)	2022
24	Journal Article	Optimized partitioning and priority assignment of real-time applications on heterogeneous platforms with hardware acceleration	Daniel Casini, Paolo Pazzaglia, Alessandro Biondi, Marco Di Natale	Journal of Systems Architecture	2022
25	Journal Article	Multi-Criteria Optimization of Real-Time DAGs on Heterogeneous Platforms under P-EDF	Tommaso Cucinotta, Alexandre Amory, Gabriele Ara, Francesco Paladino, Marco di Natale	ACM Transactions on Embedded Computing Systems	2023

Table 5 AMPERE project publications

Ampere project accepted papers, pending publication					
No.	**Type of Scientific Publication**	**Title**	**Authors**	**Journal or equv,**	**Year**
1	Article in a Journal	Taskgraph: A Low Contention OpenMP Tasking Framework	Chenle Yu, Sara Royuela, Eduardo Quiñones	IEEE Transactions on Parallel and Distributed Systems	2023
2	Publication in Conference Proceedings/Workshops	Towards a RISC-V Open Platform for Next-generation Automotive ECUs *Distinguished paper award	Luca Cuomo, Claudio Scordino, Alessandro Ottaviano, Nils Wistoff, Robert Balas, Luca Benini, Errico Guidieri, Ida Maria, Savino	11th International Conference on Cyber-Physical Systems (CPSIoT)	2023
3	Publication in Conference Proceedings/Workshops	Memory Latency Distribution-Driven Regulation for Temporal Isolation in MPSoCs *Nominated for outstanding paper	Ahan Saeed, Dakshina Dasari, Daniel Mueller-Gritschneder, Andreas Gerstlauer, Denis Hoornaert, Dirk Ziegenbein, Ulf Schlichtmann, Renato Mancuso	ECRTS 2023 – 35th Euromicro Conference on Real-Time Systems	2023

4	Article in a Journal	Framework for the Analysis and Configuration of Real-Time OpenMP Applications	Tiago Carvalho, Luis Miguel Pinho, Mohammad Samadi, Sara Royuela, Adrian Munera, Eduardo Quiñones	IEEE International Conference on Industrial Informatics (INDIN 2023)	2023
5	Publication in Conference Proceedings/Workshops	Fault-tolerant applications through OpenMP	Adrian Munera, Sara Royuela, Eduardo Quiñones.	10th BSC Severo Ochoa Doctoral Symposium, Spring 2023	2023

Table 6 Ampere project accepted papers, pending publication

4.6 Whitepaper and factsheet

To help share information about the project and ensure continuity of its results once it ends, the dissemination team will work with the technical work packages to craft 1 whitepaper and 1 factsheet about the project's results. These documents will build on the final results published in the technical deliverables, which will be completed on 30 June 2023. Once this information has been analysed and consolidated, the final factsheet and whitepaper will be published and disseminated together with the final press release.

5. Community building and sustainability

Building a community around project results has been a main goal of the dissemination activities. AMPERE technology has the potential to contribute to open communities to foster technologies and solutions within broad development environments to ensure the sustainability of the project. Throughout the project, consortium partners have contributed to several open communities. The most successful participations include those undertaken within the context of OpenMP. Some especially noteworthy participations include:

- OpenMP Architecture Review Board Chief Executive Officer, Michael Klemm, participates in the AMPERE project Industrial Advisory Board
- Participations in the 2021 and 2022 International Workshops on OpenMP (IWOMP; Annual workshop dedicated to the promotion and advancement of all aspects of parallel programming with OpenMP. It is the premier forum to present and discuss issues, trends, recent research ideas, and results related to parallel programming with OpenMP)
    - 2022 Keynote Speech by BSC's Sara Royuela on the need to adapt the Open MP model to critical real-time systems (Figure 10).
- Participation in the OpenMP Users Monthly Teleconferences, 'OpenMP Tasking: Extensions and Optimizations for Performance, Predictability and Resilience'
- Publication on 'Taskgraph', an OpenMP-compliant task-dependency graph-based framework

Figure 10 Excerpt from Sara Royuela keynote speech at IWOMP 2022

5.1 Technology Transfer

Transferring the knowledge and technology created in the project represents an activity that fosters impact, particularly beyond the end of the project. AMPERE project partners have worked to share information about the project's results and uses to other relevant application domains and stakeholders. Three cases of technology transfer are especially relevant: the RESPECT, Rising Stars and EXTRACT projects.

The RESPECT project, coordinated by the Barcelona Supercomputing Center and composed of business mentors BOSCH and Airbus, builds on the AMPERE- produced Task Dependency Graph for multi-criteria analysis. It expands on AMPERE's results to rise to technology readiness level 6 by consolidating the Taskgraph framework, extending and testing features for resilience and consolidating and extending application domains (automotive and space). Applications of the RESPECT project include spacecraft applications for image and radar processing, data and image compression, signal processing and machine learning and automotive applications for the evaluation of heterogeneous parallel programming models. These use cases will allow the project to further demonstrate the Dependable Parallel Environment technology in a relevant environment.

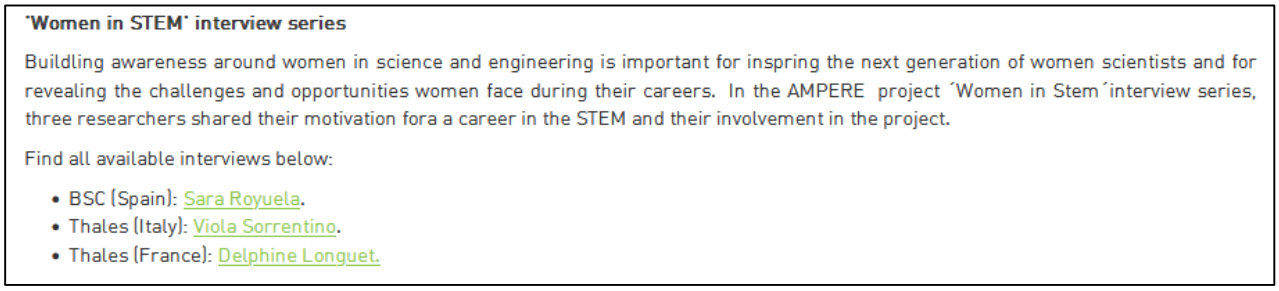
EU-funded projects EXTRACT and Rising Stars also build on AMPERE project results. The EXTRACT project (A distributed data-mining software platform for extreme data across the compute continuum) is a Horizon Research and Innovation action that began in January 2023. It seeks to create a data-driven open-source software platform that integrates the most relevant technologies to facilitate the development of trustworthy, accurate, fair and green data mining workflows to generate high-quality and actionable knowledge. This project leverages the use of the AMPERE-developed Task Dependency Graph to represent these data mining workflows. Doing so allows the EXTRACT project to provide a simple mechanism to express the specific extreme data requirements and application-related requirements. This level of abstraction will enable the design of a distributed orchestration in which any compute continuum resource will have the capability to take orchestration decisions based on the same information, that is the Task Dependency Graph.

Rising Stars is a Marie Sklodowska-Curie Action whose main goal is to enable a parallel programming framework for the development and execution of advanced large-scale Cyber Physical Systems (CPS) with HPC and rea-time requirements. It builds on AMPERE's results by analysing advanced parallel programming

models currently used in HPC and embedded computing. Building on AMPERE´s work, the Rising Stars project seeks to address parallel programming challenges with the objective of increasing software development productivity.

6. Diversity and equality

The AMPERE project has participated in a range of events to raise awareness of the women in science, to create a space for women in HPC, and to showcase the work done by the women researchers in the project. A dedicated webpage was created on the project website dedicated to 'Equality and Diversity'. The Gender Equality Plans of partners were made available, as were links to the project's campaigns related to this topic. WP7 created ´Women in Stem' interview series as a space for women researchers from BSC, Thales Italy and Thales France could share information about their research background and specific contributions to the project.



'Women in STEM' interview series

Building awareness around women in science and engineering is important for inspring the next generation of women scientists and for revealing the challenges and opportunities women face during their careers. In the AMPERE project ´Women in Stem´interview series, three researchers shared their motivation fora a career in the STEM and their involvement in the project.

Find all available interviews below:

- BSC (Spain): Sara Royuela.
- Thales (Italy): Viola Sorrentino.
- Thales (France): Delphine Longuet.

Figure 11 Excerpt from the AMPERE project website, 'Women in STEM' interview series

BSC researcher, Sara Royuela, has played an active role in promoting the visibility and voice of women in HPC. She has used the AMPERE project as a platform to help share her work with a variety of audiences and is heavily involved in organisations that promote women.

Figure 12 Tweet about BSC partner, Sara Royuela´s participation in the ISC ´22 Workshop on Women in HPC

7. Key Performance Indicators

The AMPERE project key performance indicators (KPIs) were defined in *D7.1 Communication and Dissemination Plan* based on the commitments expressed in the description of action. These indicators

were identified as reliable metrics for measuring the impact of dissemination activities and ensuring that it was possible to ensure a follow up and to monitor the project´s progress over its lifetime.

Key performance indicator	Explanation	Total target (by the end of the project)	Status at M42
Scientific Publications	Papers published in scientific venues and journals	At least 4 publications per year	25 Publications **Goal of 16 surpassed**
Academic and Industrial Events	Participation in events	At least 10 participations	47 participations **Goal of 10 surpassed**
	Events organized, including conference booths, tutorials and workshops (with significant attendance, i.e., above 30 people)	At least 1 event organized and a booth in smart mobility related event	2 workshops organized, 2 co-organized 1 Booth in the Smart City World Expo **Goal of 1 event 1 booth surpassed**
Press Strategy	Number of press releases	1 press release per year	2 press release out of 3 **Pending: Final press release, on track July 2023**
	Press clippings	At least 25 press impacts	23 out of 25 impacts **Pending: 2 clippings, on track July 2023**
Whitepapers and Factsheet	Number of business and scientific whitepapers or factsheets published	At least 1 business and 1 scientific whitepaper or factsheet	0 factsheet and white papers **Pending: Waiting for publication of results, on track July 2023**
Website	Visitor statistics (number of website users, old unique visitors)	At least 1000 users per year	6000 + **Goal of 4000 surpassed**
Social Media Channels	Number of followers on Twitter	Twitter: At least 250 over the project	344 followers **Goal of 250 surpassed**
	Number of LinkedIn followers	LinkedIn: At least 150 over the project	257 followers **Goal of 150 surpassed**
Dissemination Materials	Number of posters	At least 2 posters	2 posters **Goal of 2 posters met**
	Number of project videos	At least 2 videos	2 videos **Goal of 2 videos met**

Table 7 AMPERE Communication and dissemination KPIs

8. Conclusions and next actions

Overall, during the lifetime of the project the AMPERE project met the communication and dissemination goals it had set out. The dissemination team ensured that the intended outputs, outcomes and impact of

this project were communicated and understood by a variety of audiences. Moreover, the technical work driving AMPERE created a basis for a strong community to develop around it.

In terms of the key project indicators that monitor the project progress, 8 of the 11 KPIs were met, five of which surpassed the initial goals (website sessions, social media followers of both channels, publications, events). These activities are a testament to the work carried out by the consortium to widely disseminate information about the AMPERE project and its results. Website sessions and social media presence were an important means of communication during the COVID-19 pandemic. While the pandemic halted in-person activities, it moved the communication to the digital realm where the website and social media channels allowed partners to stay connected to the project target audiences.

Participation in events was also significantly higher than initial expected. This may seem unexpected due to the COVID-19 pandemic, but more options were made available for participating online rather than in person. Moreover, after the two years of a reduction in conferences, there was an important move to re-schedule previously cancelled events and return to normality. In any event, consortium partners took advantage of the opportunities offered to them to participate and organize events. The number of publications was also higher than expected, however not significantly so.

In terms of the three KPIs that have not completely been met at the time of writing the deliverable, they are all on track to be completed by the end of the project reporting period (August 2023), if not beforehand. For example, the final press release will be launched at the end of June 2023, or the first week of July 2023. This press release will provide a concise overview of the key project results and will help signify the official end of the project. It is reasonable to expect that the following the final press release, there will be at least 2 press impacts, which will allow the indicator to be reached.

The whitepaper and factsheet are in the process of being designed. However, as these documents rely on the final numbers and results of the project, the documents will not be publicly available until all of the final project results are reported. WP7 believes that the final versions of the whitepaper and factsheet will be ready, and on the website and disseminated directly to their target audiences, by mid-July 2023.

Besides the overall positive results reflected by the KPIs, it is worth noting that two very important accomplishments not included in the table include the work undertaken to integrate AMPERE project results into the OpenMP community and the technology transfer to the RESEPC, RISING STARS and EXTRACT projects. These accomplishments are an important reflection of the value of the project, as they will help ensure sustainability beyond the official lifetime of the project.

9. Acronyms and Abbreviations

- BSC – Barcelona Supercomputing Center
- CPSoS – Cyber Physical Systems of Systems
- D – Deliverable
- DePe – Dependable Parallel Environment
- DoA – Description of Action (Annex 1 of the Grant Agreement)
- EB – Executive Board
- EC – European Commission
- EXTRACT – A distributed data-mining software platform for EXTReme data ACross The compute continuum
- HiPEAC -- High Performance, Edge And Cloud computing
- HPC – High Performance Computing
- IPR – Intellectual Property Right

- ISEP – Instituto Superior de Engenharia do Porto
- IWOMP – International Workshop on OpenMP
- KPI – Key Performance Indicator
- M – Month
- OSPM – Power Management and Scheduling in the Linux Kernel
- PM – Person month / Project manager
- RESPECT – Reliable Heterogeneous Parallelism for Embedded Critical Systems
- ROS – Robot Operating System
- RTOS – real-time operating system
- SSSA – Scuola Superiore Sant'Anna
- WP – Work Package
- WPL – Work Package Leader

Annex 1 Dissemination register

AMPERE project dissemination register 2020-2023			
Partner	**Type of activity**	**Details**	**Starting Date**
SSSA	Non-Scientific and non-peer reviewed publication	Sant'Anna Magazine	21/01/2020
BSC	Project meeting	AMPERE Kick-Off meeting	27/01/2020
BSC	Website	Website launch	09/04/2020
BSC	Social Media	Twitter created	02/01/2020
BSC	Social Media	Linkedin created	02/01/2020
BSC	Exhibition	DATE2020, HiPEAC booth AMPERE poster	10/03/2020
BOSCH	Participation to a conference	DATE 2020	10/03/2020
ALL	Press Release	Press release	18/03/2020
ALL	Press clipping	HPC Wire article - BSC researchers create software architecture…	18/03/2020
ALL	Press clipping	HPC Wire article- AMPERE: strengthening European Leadership	18/03/2020
ALL	Press clipping	eeNewsEurope article	18/03/2020
ALL	Press clipping	BSC article	18/03/2020
ALL	Press clipping	News Break article	18/03/2020
BSC	Press clipping	BSC researchers create software architecture to refine energy-efficient cyber-physical interactions	18/03/2020
ALL	Press clipping	Cordis article	20/03/2020
ALL	Press clipping	Primeur Magazine article	20/03/2020
ALL	Press clipping	Tecnonews article	24/03/2020
ALL	Press clipping	L'Embarque article	30/03/2020
ALL	Press clipping	ECD blog	21/04/2020
ALL	Press clipping	Embedded Computing Design article	06/04/2020
BSC	Communication campaign (e.g. Radio / TV)	ECD podcast	27/05/2020
BSC	Participation to a conference	ISORC 2020	19/05/2020
BSC	Participation to a conference	SCOPES 2020	25/05/2020
BSC	Flyer	AMPERE Flyer	02/06/2020
ETHZ	Participation to a conference	LCTES 2020	16/06/2020
SSSA	Press clipping	The Real-Time Systems Laboratory (ReTiS Lab)	22/06/2020
SSSA	Participation to a workshop	ISC 2020	25/06/2020
BSC	Participation to a workshop	ISC 2020 C3PO (collocated with ISC-HPC)	25/06/2020
BOSCH	Participation to a workshop	ECRTS 2020	10/07/2020
BSC	Other	Online F2F AMPERE Meeting	14/07/2020
BSC	Participation in a conference	EUROPAR-26th International Conference on Parallel and Distributed Computing- 'A Toolchain to Verify the Parallelization of OmpSs-2 Applications'	28/08/2020
BSC	Participation to a workshop	SoS integration with CPS	10/09/2020
BSC	Press clipping	HiPEAC info 61	14/10/2020
BSC	Participation to a workshop	SPLASH 2020	16/11/2020
BSC	Press clipping	OmpSs BSC article	18/01/2021

BSC	Press clipping	HiPEAC info 62	18/01/2021
BSC	Press clipping	Scientific Computing World	02/03/2021
BSC	Video / film	AMPERE video 1	11/03/2021
BSC	Press clipping	Cordis video	12/03/2021
BSC	Press clipping	Big Data Value article	29/03/2021
SSSA	Participation to a conference	29th International Conference on Real-Time Networks and Systems	07/04/2021
SSSA	Non-Scientific and non-peer reviewed publication	RTNS 2021	08/04/2021
BSC	Press clipping	ARTEMIS magazine	11/05/2021
SSSA	Participation in a conference	24th International Symposium on Real-Time Distributed Computing	01/06/2021
BSC	Training	Ada Europe/ https://www.istr.unican.es/ae2021/overview.html	07/06/2021
BSC	Exhibition	ISC 2021	24/06/2021
BSC	Non-Scientific and non-peer reviewed publication	30 project news	02/07/2021
ALL	Project meeting	F2F hosted at BSC	07/07/2022
BOSCH	Participation in a conference	MLCAD 2021	31/08/2021
ISEP	Participation in a conference	CERCIRAS ECI Forum	03/09/2021
BSC	Training	ACACES 2021	13/09/2021
BSC	Participation in a conference	IWOMP 2021	14/09/2021
SSSA	Participation in a conference	37th ACM/SIGAPP Symposium On Applied Computing	25/04/2021
BSC	Participation to a workshop	SCIOPS 2022 add newspiece	16/05/2022
BSC	Participation in a conference	Women in High Performance Computing Workshop - ISC 22	02/06/2022
SSSA	Co-chair of workshop	17th Workshop on Virtualization in High-Performance Cloud Computing	02/06/2022
SSSA/Bosch	Participation to a workshop	HiPEAC-Forecast 2022-Functional Properties and Dependability in Cyber-Physical Systems	11/06/2022
BSC/ISEP	Organization of a workshop	STEADINESS: System Engineering and Dependability in Cyber-Physical Systems	11/06/2022
BSC/BOSCH	Participation in a conference	26th Ada-Europe International Conference on Reliable Software Technologies-Paper presentation, "Increasing CPS Productivity and Resiliency through Accelerated Software Replication"	14/06/2022
ISEP	Participation in a conference	26th Ada-Europe International Conference on Reliable Software Technologies, Talk, "Tracing and Measuring GPU Execution in Automotive Software Systems" w/i Technical session 6: Verification Challenges	14/06/2022
BSC	Participation in a conference	26th Ada-Europe International Conference on Reliable Software Technologies, Chair Technical Session 4:Advanced Systems	14/06/2022
ETHZ	Participation in a conference	Samos Conference - International Conference on Embedded Computer Systems: Architectures, Modeling, and Simulation	06/07/2022
BSC	Keynote	18th International Workshop on OpenMP	30/09/2022
BSC	Community talk	OpenMP Tasking, Part 2: Advanced Topics	28/10/2022
ALL	Flyer	2nd flyer, updated with use cases and more details	15/11/2022
BSC	Booth in a conference	Smart city world expo booth	15/11/2022
BSC	Brokerage event	Smart city world expo brokerage event	16/11/2022
BSC	Participation to a workshop	HiPEAC2023-WASOS:Workshop on Adaptive CPSoS	18/01/2023
all	F2F project meeting	Porto F2F hosted by ISEP	28/02/2023

BSC	Participation in a conference	GdR SOC2 - IRT Saint Exupéry: "HPC for Embedded Systems"	14/03/2023
SSSA	Co-organizing a conference	5th OSPM Summit	17/04/2023
BSC	Participation in a conference	10th International BSC Severo Ochoa Doctoral Symposium 2023- "Fault-tolerant applications through OpenMP"	09/05/2023
SSSA	Co-organizing a workshop	18th Workshop on Virtualization in High-Performance Cloud Computing	25/05/2023
ALL	Press release	AMPERE-developed Taskgraph framework enhances programmability and performance for rail and automotive industries	30/05/2023
ALL	Press clipping	HPC Wire article	30/05/2023
ALL	Press clipping	IK APK article	30/05/2023
EVI	Participation in a conference	Mediterranean Conference on Embedded Computing (MECO)/ International Conference on Cyber-Physical Systems and Internet-of-Things (CPS&IoT) - Presentation "Towards a RISC-V Open Platform for Next-Generation Automotive ECUs" - Best paper award	06/06/2023
BSC	Participation in a conference	27th Ada-Europe International Conference on Reliable Software Technologies	13/06/2023
BOSCH	Participation in a conference	27th Ada-Europe International Conference on Reliable Software Technologies	13/06/2023
ISEP	Participation in a conference	27th Ada-Europe International Conference on Reliable Software Technologies	13/06/2023
ALL	Flyer	Final Event flyer for circulation mainly at Ada-Europe event	13/06/2023
ALL	Final video	AMPERE FINAL VIDEO	23/06/2023
ALL	Final event	HiPEAC hosted webinar	27/06/2023