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Big Data Analytics for Time Critical Mobility Forecasting

datAcron

D7.6 Dissemination Report (final)

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EXECUTIVE SUMMARY

This document reports on dissemination activities of the H2020 dataAcron project, organised within Task 7.1 "Dissemination", from M01 until the end of the project and beyond the project closure.

The document includes the dataAcron communication and dissemination strategy and plan, and reports on the dissemination activities organised and planned in support of the project exploitation strategy described in deliverable D7.3 "Exploitation Strategy".

The present document updates and supersedes the previous interim deliverable D7.2. In the interest of self-containment, this document retains relevant content.

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1. INTRODUCTION

This document reports on the dissemination activities organized for the H2020 datAcron project, organised within Task 7.1 "Dissemination", which lasted from M01 until the end of the project at M36.

This deliverable, after presenting the communication and dissemination strategy and plan of the H2020 datAcron project, presents the outcomes of Task 7.1 "Dissemination", reporting on the dissemination activities organised to promote the project achievements, including related activities already organized that will be completed after the end of the project. The dissemination plan and the corresponding activities are organised in support of the datAcron exploitation strategy (cf. D7.3 "Exploitation Strategy").

The datAcron dissemination strategy goal was the introduction of the innovations of the project to the relevant stakeholders as identified by the project partners and the wider European business and research communities, to reinforce the project impact and the exploitation of the project results. The communication strategy supported the work of exploiting project results, focusing on the coordination of the outreach and dissemination activities necessary to achieve the project exploitation targets and promoting the work done during the project by the most appropriate among the available tools, methods and channels.

The present document updates and supersedes deliverable D7.2. In the interest of self-containment, this document retains relevant content. This document does not include the outcomes of training activities, which are reported in deliverable D7.7 "Training report – final", delivered at the same time of this document.

2. COMMUNICATION AND DISSEMINATION STRATEGY

This section presents the communication and dissemination strategy of the **datAcron** project. The dissemination activities and plan for implementation is presented in the next section.

2.1 Project overview

*The **datAcron** vision is to advance the management and integrated exploitation of voluminous and heterogeneous data-at-rest (archival data) and data-in-motion (streaming data) sources, so as to significantly advance the capacities of systems to promote safety and effectiveness of critical operations for large numbers of moving entities in large geographical areas. (Excerpt of the datAcron proposal)*

datAcron has developed novel methods for real-time detection and prediction of trajectories and important events related to moving entities, aiming at increasing the **safety, efficiency and economy** of operations concerning critical operations (e.g. surveillance, forecasting of trajectories, characterisation of maritime traffic, etc.) in the Air-Traffic Management and Maritime domains, as well as other domains involving voluminous number of moving entities in large geographical areas.

datAcron objectives addressed challenges in data management and processing architectures, pattern detection and trajectory analysis, predictive analytics and visual analytics. More specifically, the goals of datAcron could be summarised as follows:

- Scalable integration and management of data from disparate and heterogeneous sources.
- Real-time detection and forecasting of moving entities' trajectories
- Real-time event recognition and forecasting
- Real-time interactive analytics
- Validation and evaluation of the **datAcron** system and individual components on the surveillance of moving entities in the air-traffic management (ATM) and maritime domains.

2.2 Dissemination objectives

*The precise objective of the **datAcron** dissemination strategy will be **to introduce the innovations of the project to the relevant stakeholders as identified by both the project partners and the wider EC business and research communities.** The intended impact of the dissemination strategy will cut across several areas considered crucial to the successful exploitation of the **datAcron** project offering. **These will include research and commercial as well as standard setting and educational training**. Where it becomes pertinent this may also extend **to policy-making (social and industrial), skills and investment communities** who may benefit from **datAcron** project results.*

*The core of the dissemination strategy will be based around an **exploitable items list** produced during the projects' lifetime which in turn will be augmented based on the impact of engagement strategies focused on gathering the latest and most relevant market information through the lifetime of the **datAcron** project.*

The communication strategy will support the work of exploiting project results, focusing on the coordination of the outreach and dissemination activities necessary to achieve the project exploitation targets and promoting the work done during the project by using appropriate and useful tools, methods and channels. The Dissemination and Exploitation work package will ensure these results are communicated through dedicated presentations, publications, participation in and organisation of workshops and conferences. (Excerpt of the datAcron proposal)

The Key objectives of **datAcron** dissemination were:

- *Creating **awareness** and reasoning behind the project objectives, concepts and relevant results*. Activities planned to accomplish this objective included:
  - activities targeted to specialised media in order to reach industry, big-data players, including key messages on the potential benefits of project objectives and results for the communities referring to use cases and applications.

- o activities targeted to generalised media in order to reach general public and European citizen, focusing on potential benefits for solving societal challenges, referring to use cases and applications
        - o promotion on social media addressing relevant networks of interest for the project (big data, aviation, maritime, EU projects groups and research communities)
    - o *Understanding datAcron targets groups and how they stand to benefit from the project results. The consortium developed an acute understanding of the relevant stakeholders in both commercial, operational (i.e., domain-specific) and research settings through outreach activities, as well as through the expertise of the project consortium and knowledge transfer within the relevant communities. This was achieved through direct dissemination activities and by leveraging the individual skills and community memberships of the project partners*. Activities carried out to reach this goal included:
        - o Activities entailing the direct participation of stakeholders: meetings with stakeholders and interest groups, specialised workshops and participation in specialised events, preparation of questionnaires, development of bi-lateral project collaborations
    - o *Actions to receive feedback on the project in the form of validation of results, alternative approaches and industrial advice from within the project expertise or the wider project community*. Dissemination activities aiming at receiving feedback from key stakeholders were very in lines with those mentioned above, including:
        - o Demonstrations of project prototype to scientific and industry dominated events
        - o Activities entailing the direct participation of stakeholders: validation meetings with stakeholders and interest groups, specialised workshops and participation in specialised events, questionnaires and analysis of results
    - o **Promote understanding** of project visions and innovative methods and **actions** to pave the way to knowledge transfer of project results and foresight, through:
        - o Activities directed to educational training and academia (publications, workshops, trainings, data challenges)[1]
        - o Demonstrations of project prototype to scientific and industry dominated events
        - o Activities entailing the direct participation of stakeholders: meetings with stakeholder and interest groups, specialised workshops and participation in specialised events, bi-lateral project collaborations.

The impact of all activities in project dissemination and exploitation has been regularly analysed and evaluated by the whole consortium, during executive meetings.

2.3 Target Audience

datAcron addressed a variegate audience, ranging from communities to acquire knowledge from and to boost adoption of knowledge, approaches and methods developed by the project, to communities to raise awareness on the project vision, objectives and results, including:

- the *commercial Big Data community*, e.g., scalable analytics providers, data integration solution providers, big-data solution developers, in particular related to the aviation and maritime domain;
- the *scientific community active in Big Data and visual analytics*, machine learning, Big Data and information management, maritime security and signal processing, air traffic management;
- *standardisation and regulatory bodies* drafting interoperability standards for Maritime Security and , air traffic management;
- *education and training programmes* targeting to students (MSc & Phd), industry and domain-specific communities;
- *the Maritime Situation Awareness* community as represented by the different nations of the NATO body;
- *air traffic management* community.

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[1] This document does not include the outcomes of training activities, which are reported in deliverable D7.7 "Training report – final", delivered at the same time of this document.

[2] Please refer to deliverable D7.3 "Exploitation strategy" for a detailed description of the exploitation strategy

Besides the aforementioned communities, **datAcron** dissemination strategy exploited media and social media as a means to reach the key communities for transfer of knowledge, in particular towards the commercial community and the scientific community, as well as networking with European programmes and projects of interest for the project and promoting awareness at citizen level. Other dissemination activities are meant to promote the participation of the domain interest user groups, in order to validate and maybe enrich operational requirements and use case specific experiments for validating/evaluating datAcron scientific results.

2.4 Communication

Project representatives and Spokespersons

The Project Coordinator and the representatives of the WP7 leader, in quality of **project spokespersons**, were officially entitled to act as representatives of the project and the consortium <u>for media engagement activities</u> (cf. Media Plan).
Partners invested in a leading role for special activities, such as the local host of a workshop, the organiser of a demonstration etc., acted as representative for the project and the consortium <u>for the specific activity</u>. In addition to that, any partner being disseminating project activities in scientific events, bi-lateral meetings or public events acted on behalf of the project and as project representatives <u>for the specific activity</u>.

Internal communication activities and tools

Internally to the consortium, day-to-day communication was achieved via project mailing list, phone calls and videoconferences. Meetings were planned by the PC and inserted in the project calendar. In addition, a *FileStore* set up by UPRC was used for sharing documents, storing project reports, deliverables, datasets for internal use and any other type of digital material, including this document.

Internal point of contacts

Internal day-to-day communications regarding dissemination were handled among dissemination points of contact (POCs), at least one per partner. Each POC represented his/her organisation when deciding on organisational aspects of dissemination, and were responsible for collecting information at partner.

2.5 Dissemination and Exploitation roles

The **datAcron** communication strategy was organised according to communication and dissemination roles, specific to the organised activities. The partners referred to the corresponding roles and responsibilities for their organisation, as detailed in the datAcron Dissemination Plan shared and agreed among the partners.

The main roles for dissemination and exploitation activities are reported in Table 1. Additional roles are defined in Table 2 for the development of the specific dissemination activities.
As an overall approach, all activities were leaded by activity *managers*, who, in close collaboration with the WP7 leader and the PC, were responsible for the main aspects of the activity's organisation, communication and dissemination strategy and guaranteed that the consortium as a whole was represented and that all the partners contributed to the activity execution. Moreover, for groups of similar activities, each single activity could have a *leading* partner, responsible for the execution of the specific activity in close collaboration with the activity manager, the WP7 leader and the PC (e.g., the local organiser of a workshop, a partner giving a demonstration or a conference presentation). In such cases, the manager guaranteed the harmonization of the group of activities in terms of organisation, communication and dissemination, and that each activity had the right visibility. In cases of activities with correlated organization, coordination is required, and roles were merged. In some cases, such as the visual identity, a role was assigned to one or more partners working in close collaboration.

Table 1 Communication, Dissemination and Exploitation roles

Roles	Responsibilities
Project coordinator	Partner coordinating the execution of project

WP7 leader	Coordinating the preparation of WP7 Dissemination and Exploitation deliverables
Dissemination manager	Managing dissemination strategy and activity, leading activity throughout consortium and reporting on impact against agreed quantitative and qualitative dissemination targets Producing and updating communication and dissemination plans and reporting on impact Creation of feedback and audience intelligence documents
Exploitation manager	Managing exploitation strategy and activity, leading activity throughout consortium and reporting on impact Creation of feedback and audience intelligence documents
Outreach responsible for Commercial Big-data community	Responsible for outreach activities addressing the commercial big data community
Outreach responsible for Commercial ATM community	Responsible for outreach activities addressing the ATM community
Outreach responsible for Commercial Maritime Surveillance community	Responsible for outreach activities addressing the maritime surveillance community
Outreach responsible for Research Community	Responsible for outreach activities addressing the research and scientific community
Outreach responsible for Standard Settings	Responsible for outreach activities addressing the standardisation community
Outreach responsible for Educational Training	Responsible for outreach activities addressing training stakeholders

Table 2 Dissemination activities and responsibilities

Activity	Manager	Leading partner
Media engagement	**Project public affair** Coordinates and organises the media engagement activities, managing contacts with media, interviews, press releases, videos production	**Project spokespersons** People officially entitled to speak on behalf of the project in media engagement activities. **Partners spokespersons** People entitled to act as partner representatives in media engagement activities. **Activity representatives** People responsible for the organisation of the execution of dissemination activities, acting as project representative for the specific activity (e.g., scientific expert, workshop organiser)
Visual identity	**Visual identity manager** Coordinates visual/brand identity tasks, such as definition of logo, templates, gadgets	
Website	**Website manager** Defines the website structure and graphical layout, coordinates and harmonises the preparation of the content. Report the partners on website analytics updating the dissemination plan. Records analytics for deliverable reports. **Web master** Registers the website. Partner responsible for the implementation of the website structure and of the technical administration of the project website and blog. Establishes and reports on website analytics.	
Factsheet	**Factsheet manager** Coordinates and harmonises the preparation of the content of the factsheet Produces the factsheet	
Project posters and flyers	**Poster and flyer manager** Defines the layouts of project posters, flyers, informative brochures and coordinates the preparation of the content. Produces the material	
Social media and blog	**Social Media and Blog manager** Manages social media and blog schedule updates, using a project calendar to ensure there is the correct	

Activity	Manager	Leading partner
	volume of dissemination coverage during important/relevant periods of the project lifetime. Registers social media profiles and groups and updates them with branded imagery and logos. Manages invitations to social media groups. Establishes and reports on analytics through the FileStore and updating the dissemination plan. Records analytics for deliverable reports. Calls for content from partners and update the social media profiles with <u>consortium-sourced content</u>. Coordinate discussions, coordinating <u>posts from consortium partners</u>, looking for responses from collaboration partners and recording results. Following the project and dissemination calendar, <u>in collaboration with partners</u> plans relevant commercial/research topics for discussion on social media groups. In collaboration with partners, coordinates the updates of the blog with news on project events, related events.	
Mailing list	**Mailing list manager** Creating and technically administering the project mailing list	
FileStore	**FileStore manager** Creating and technically administering the project Filestore	
Telco	**Telco manager** Coordinating the organisation of partner teleconference meetings **Telco minute managers** Produces minutes for telco partner meetings. Recording action points from work package teleconferences and distributing to partners (through the FileStore)	
Workshops manager	**Workshops manager** Coordinates the organisation of project workshops, ensuring all workshops have updated and high quality dissemination material, adopt project visual identity and branding, and the project consortium is fully represented. In collaboration with partners and workshop organisers, call for contributions from partners and scientific and industrial collaborators and, <u>in collaboration with partners</u>, coordinates the selection of contributions.	**Workshop organiser** Responsible for the local organisation of workshops. Supports the workshop manager in calling for contributions from partners and scientific and industrial collaborators and in the interaction with local companies and entities involved in the organisation of the event. Supports the project public affair in the organisation of media engagement activities, providing local contacts of relevant media and helping in the organisation of press releases and interviews with media.
Scientific papers	**Scientific papers coordinator** <u>In collaboration with partners,</u> decides the list of topics and relevant scientific events/journals that datAcron related papers shall be submitted (per year).	
Whitepapers and technical papers manager	**Whitepapers and technical papers manager** <u>In collaboration with partners,</u> decides the list of issues and topics for whitepapers and technical papers and coordinates their preparation, coordinating and calling for <u>contributions from partners</u>	
Technical demonstrations	**Demonstrations manager** In collaboration with partners, coordinates the overall preparation of technical demonstrations Coordinating contributions from partners	**Demonstration organisers** In collaboration with partners, responsible for the preparation of technical demonstrations
Meetings and collaborations	**Meetings and collaborations manager** In collaboration with partners, coordinates bi-lateral collaborations with stakeholders, coordinating the organisation of specialised meetings for standardisation and exploitation and with user interest groups. Coordinating and calling for contributions from partners	
Training manager	**Training manager** In collaboration with partners, coordinates the organisation of training activities	

3. DISSEMINATION PLAN

The datAcron dissemination plan drafted at the beginning of the project included a variegate series of activities to achieve the strategic communication and dissemination objectives presented in the previous section. Table 3 and Table 4 overview the planned activities and compare them with respect to their specific dissemination objectives and target audiences. Indeed, in order to boost the project impact and promote the adoption of datAcron methods and results in the relevant research, industrial and standardisation areas, it was necessary to differentiate the activities to target the different target communities and towards achieving as much objectives as possible. The plan was periodically evaluated by the consortium at every executive meeting and updated with new activities and material, to steer it on the most effective ones.

As detailed below, activities were scheduled around a calendar based on project milestones and important events. To assess the dissemination and evaluate its effectiveness, measures for the evaluation of activities were provided, together with estimation of expenses. The dissemination plan included a blog and social media plan and a media plan for media engagement activities.

Table 3 Objectives of dissemination activities (Aw: Awareness, U: Understanding, Ac: Action to receive feedback; Pu: Promote Understanding; Pa: Promote Actions)

Materials and activities	Objectives				
	Aw	U	Ac	Pu	Pa
Visual identity (logo, templates)	X				
Website (factsheet, news)	X			X	
Social media	X			X	
Media engagement (with publicity material, e.g., videos)	X			X	
Flyers, posters, printed materials	X				
Scientific Publications and Presentations (Journal, Conferences, Open Access)	X			X	X
Organisation of Workshops, Specialised events	X	X	X	X	X
Meetings (with stakeholders, bi-lateral H2020 projects)	X	X	X	X	X
Technical Publications, White papers	X			X	X
Datasets publication	X				X
Demonstrations (scientific, for industry)	X			X	X
Trainings (Courses, Tutorials, Lectures, Schools)				X	X
Deliverables				X	X

Table 4 Audience of Dissemination activities

Materials	Audience							
	Media	Commercial	Science	Standard	Education	H2020	Citizen	User groups
Visual identity	X	X		X				
Website	X	X	X	X	X	X	X	X
Social media			X		X	X	X	X
Media engagement	X	X		X		X	X	
Videos	X	X				X	X	
Flyers, posters, printed materials	X	X		X				X
Scientific publications and Presentations			X	X	X			X
Organisation of Workshops	X		X	X	X	X		X
Organisation of Specialised Events		X		X		X		
Meetings (with stakeholders, bi-lateral H2020 projects)						X		X
Technical Publications, White papers		X		X		X		X

Datasets publication	X	X		X	X		
Demonstrations	X	X		X			
Trainings		X		X			X
Deliverables	X	X	X	X	X	X	X

3.1 Dissemination calendar

To ensure an effective dissemination, the activities were organised on a calendar built around project milestones, reflecting important events of the project, such as project meetings, relevant scientific, standardisation and industrial events on Big Data, Maritime and Aviation Security where the partners showcase the project vision, approach and results. Milestones such as relevant conferences or events with an audience suitable for disseminating effectively project results and approaches were proposed individually by the partners in the consortium based on their expertise. Jointly, the project consortium organised targeted activities, such as workshops, meetings with stakeholders and open sessions in relevant events, to enhance the dissemination towards the potential event's audience. To increase the impact of the dissemination activities scheduled in the calendar, the web and social media channels were used. News and events were inserted in the project website as soon as an event was scheduled, and posts and tweets were also scheduled around important event's dates (e.g., workshop announcement, call for paper, open submissions). The dissemination calendar was constantly updated, based on dissemination milestones proposed by the partners and in coordination with the Project Coordinator and the WP7 leader. Dissemination activities were revised during executive meetings and the organisation of joint activities was agreed at consortium level.

3.2 Measures for evaluation

Quantitative measures for evaluation of dissemination activities were included (as for Table 5) to evaluate the progress of the activities and assess the dissemination along the duration of the project.

Table 5 Dissemination measurable goals (excerpt from the project proposal)

Dissemination goal	Target Quantity
Publications	Open access will be granted to all scientific publications resulting from **datAcron**
Papers at scientific conferences appearing in proceedings	At least 20
Papers in Journals	At least 10 *submissions* to journals of high impact
Workshop organised at a scientific event	At least 6
Stakeholders interest groups and meetings with stakeholders	At least 4
Demonstrations of prototypes at industry-dominated events	At least 3

3.3 Web Site and Social Media Plan

The **datAcron** dissemination strategy leveraged web and social media channels to promote project activities and achievements. Twitter and ResearchGate were used to reach complementary audience (LinkedIn was initially considered and then discarded). Twitter enables immediate communication and was used for fast and wide spreading of project news, as well as for creating live tweets of project events. ResearchGate, being more oriented to professionals and researchers, was used for effective advertising of project achievements, to share dissemination materials, videos and presentations as well as for open discussions on project topics. The project news page on the website (www.datacron-project.eu) remained the primary source of information for project events, and the website and social media channels scheduling were planned accordingly.

3.4 Media Plan

The datAcron media plan was integral part of the datAcron dissemination plan, aiming to raise awareness and promote understanding with targeted audiences about the project as per the dissemination/exploitation goals detailed by the communication strategy. In particular, the media plan supported the stakeholders' engagement effort based on the exploitable items list created through the lifetime of datAcron.

The overall approach was ACTIVE. The media plan covered datAcron development from M1 to M36, with media engagements activities clustered around the project's milestones, conducted through any suitable channel.

The plan was drafted by CMRE Public Affairs Office (PAO) as WP7 Project Leader, with the aim of being implemented in collaboration with the Project Coordinator and all Project Partners.

Media trends and assumptions

Currently, there is a general, positive appetite for news related to big data. No heavy bias against this particular kind of activities is being observed. Media trends in targeted specialised audiences would be anticipated as positive. As regards the general public, the high specialisation of datAcron goals required some additional educational efforts from the consortium when/if addressed. Particular attention had to be posed in any case on provision/production of suitable and effective imagery from all Partners.

Executive Summary

As detailed in WP7, the Project's dissemination activities and thus the media engagement activities were instrumental to the stakeholders' engagement foreseen as part of the exploitation effort. Dissemination goals were achieved through the promotion of the datAcron concept and vision by highlighting its competitive advantage against existing approaches.

Media engagements opportunities were identified through the lifetime of datAcron. Media activities were coordinated by WP7 Leader in collaboration with the Project Coordinator. Each partner was anyway requested to cooperate by:

- Fostering and sharing media opportunities;
- Supporting media engagements, especially when hosting local events;
- Producing and sharing relevant contents and imaging.

As based on a consortium of partners, datAcron was not subject to stringent restrictions, if not specified otherwise: nevertheless the Partners involved were expected to pass through the Project Coordinator and the WP7 Leader before releasing any information on the project, and to report to the Consortium in real time any event occurring that would have resulted in an issue with severe impact in the project, or would have given the possibility to gain a positive media coverage. In case of inquiries from the media, the Project Coordinator and the WP7 Leader could, at a point agreed with the Projects' partners, release additional statements or feature story. The media and the social media plans was mutually adapted to follow the project's developments in a coordinated manner.

Audience

Consistently with the exploitation targeted audiences, key media outlets to be targeted were identified.

Project Spokespersons

The Project Coordinator was the designated datAcron spokesperson; all media or public contact were coordinated through the Project Coordinator and the WP7 Leader. Where the contact is at the national level, the Partners concerned could have their own spokesperson, but communication with media was coordinated with the Project Coordinator and the WP7 Leader. All media contact was coordinated with the PC and the WP7 Leader, or any designated spokespersons that were authorised to speak on behalf of the Project. Spokespersons stacked to the key messages to be conveyed to the media/public.

Key Messages and Guidelines on Handling the Media/Public

In order to ensure coordination in terms of media/public relations, guidelines were prepared for speaking to the media or the public, covering routine public interactions as well as crisis communication. These guidelines

were issued to the Project's partners and collaborators and refer to Themes and Key messages, which gave short descriptions of the project, its vision, objectives, and of the project consortium, and were ready to be used when interacting with the media. The themes were agreed between all the Project's partners and provided the framework from which key messages were derived in occasion of each media engagement opportunity.

Themes

- **(Overall presentation)** datAcron addresses core challenges related to the European Big Data Vision towards increasing our abilities to acquire, integrate, process, analyse and visualise data-in-motion and data-at-rest in integrated manners, validating and evaluating the technological developments in real-life scenarios targeting to improving maritime and aviation operations for large number of entities in large geographical areas

- **(Vision)** The datAcron vision is to advance the management and integrated exploitation of voluminous and heterogeneous data-at-rest (archival data) and data-in-motion (streaming data) sources, so as to significantly advance the capacities of systems to promote safety and effectiveness of critical operations for large numbers of moving entities in large geographical areas.

- **(Scientific objectives)** datAcron aims to develop novel methods for real-time detection and prediction of trajectories and (b) detection and prediction of important events related to moving entities, together with (c) advanced visual analytics methods, over multiple heterogeneous, voluminous, fluctuating, and noisy data streams from moving entities, via the (d) real-time in-situ processing of multiple data streams, (e) the provision of integrated views of streaming data with archival data expressing entities' characteristics, geographical information, patterns of mobility in specific areas, regulations, intentional data (e.g. planned routes) etc., and (f) the provision of advanced solutions for managing spatio-temporal data.

- **(Societal Impact)** datAcron will address requirements from the air-traffic management and maritime domains by developing advanced tools for detecting and visualising threats, abnormal activity, increasing the safety and efficiency of operations related to vessels and airplanes, and further reducing the impact of these operations on the environment.

- **(Consortium)** datAcron brings together partners from academia and industry to develop novel methods for threat and abnormal activity detection in very large fleets of moving entities in sea and air, together with user and data-provision partners from the maritime and air traffic domains, focusing on real-life, industrial and user-defined operation challenges (e.g. surveillance, forecasting of trajectories, characterisation of maritime traffic, etc.).

- datAcron project is funded by the European Union's Horizon 2020 Programme under grant agreement No. 687591. The datAcron consortium, led by the University of Piraeus Research Center (Greece), has been awarded funding to develop novel methods for real-time detection and prediction of trajectories and important events related to moving entities in the Air-Traffic Management and Maritime domains.

- The datAcron consortium is made by 8 Partners from 6 Nations: the University of Piraeus Research Center (Greece) which is also the Project Coordinator, the Fraunhofer-Gesellsschaft (Germany), the National Center for Scientific Research "Demokritos" (Greece), the École Navale Groupement d'Intérêt Public (France), the NATO Centre for Maritime Research and Experimentation (Italy), the Boeing Research and Technology Europe (Spain), the ATM R&D Center CRIDA (Spain), and the IMIS Global Limited (United Kingdom).

- datAcron aims at increasing the safety, efficiency and economy of operations concerning large number of moving entities in large geographical areas. Integration of systems and interoperability are the key to advance current technologies for anomaly detection and identification of threats.

- datAcron focuses on challenging technical priorities and datAcron Partners work directly with relevant stakeholders in order to identify gaps and priorities, and advance the big data technologies in Europe.

Key messages

The themes presented above can be further extended with reference to each milestone. For example: "The current demo demonstrates that the new tool is able to…" or "In this application, datAcron offers a competitive advantage against existing approaches because….".

4.   DISSEMINATION ACTIVITIES AND MATERIALS

The dissemination activities organised to promote the progresses and the results of datAcron are described in this section. Activities are described in detail, reporting quantitative achievements and references to the specific activity. The section concludes discussing the overall achievements of Task 7.1, evaluating them against to the targets planned as specified in the project proposal.

4.1 Visual identity

Related material: Logo, Templates for presentations, project documents and deliverables
Delivered: M01

Figure 1 The datAcron logo

The visual identify activity and the corresponding dissemination material was meant to raise awareness on the project. The project templates for presentations and documents used the datAcron logo and the Neuropol X font whenever the name of the project appeared in a document.
The logo appears in printed materials such as project posters, flyers, technical publications, as a marking for original project pictures (beside the logo of the partner organisation(s) that created it), as well as in the project website and social media, and in technical and scientific presentations.

4.2 Project website

Related material: Project website using logo and branding, with areas for sharing project information and news (e.g., factsheet, consortium and contact information, publications, presentations, software, videos, leaflets, posters), networking to online communities, and analytics.
Additional features (optional): areas for media engagement activities, multi-media, software
Delivered: M03 (website online with news and publications section)
Estimated budget: Hosting from free to 50 euros/year depending on features. Domain registration ca. 16,00 euros / 2 years.
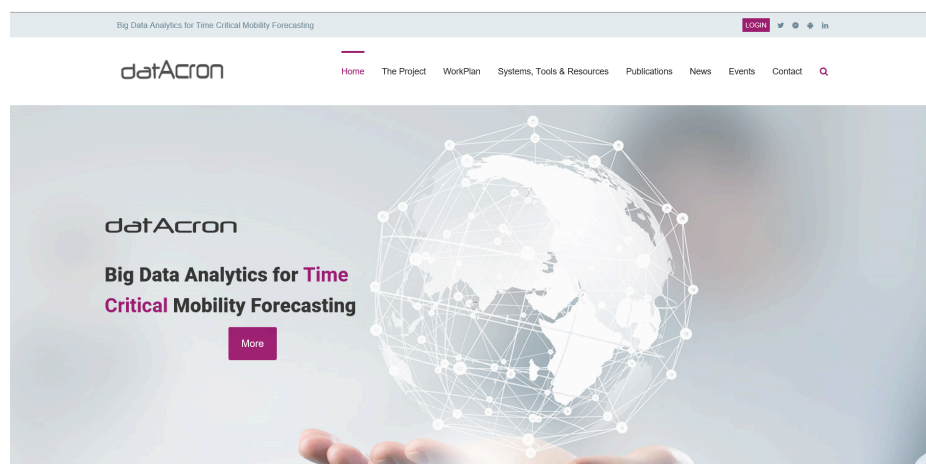

Figure 2 www.datAcron-project.eu home

The datAcron website is online since M03 at the address www.datacron-project.eu. The technical details, including website analytics, are described in deliverable D7.1 "Project Website, Wiki and Social Media Channels". A new restyling of the website has been delivered in the second half of the project.

The website structure includes:

- Factsheet: description of project vision and objectives, presentation of the partners in the consortium, contact details
- News & events page: for outreach and recording of project activities such as project meetings and workshops, events, trainings, meetings with stakeholders, participation to events, presentations, promotion of projects, events, calls of interest. News are in evidence in the home page and a RSS feed is created with the same content
- Publications: page listing and hosting all public project deliverables, publications, talks and presentations. Self-archiving of publications (green open access) is enabled. When publishers open access is available, publication records may link directly to publisher website. The open access repository Zenodo is also used with for the same purpose, the publication page in the datAcron website may link directly to the repository.
- Blog and Social media highlights in the home page, including the feed of the last tweets from the project Twitter profile.

Figure 3 QR-code to www.datacron-project.eu

A QR-code pointing to datacron-project.eu has been created (cf. Figure 3), to be included in printed project material and in presentations for an easy access to the datAcron website using smartphone bar-code readers.

The website is updated constantly along the project by the project partners, who may insert directly information about the project activities scheduled in project calendar, news about events, and may upload directly their publications. When new features and sections were created the website layout was updated accordingly.

Website Analytics

The following figures illustrate the statistics of usage of the datAcron website from its first deployment (1st April 2016) until December 2018.

Figure 4 reports the overview of the visits analytics. In 32 months, visits were almost 4000, with almost 14000 pages visited (more than 10000 as unique page views). Visitors spent more than 3 minutes on average browsing the website, doing 3.7 actions in average (page views, downloads, outlinks and internal site searches). Downloads in particular were more than 500. Figure 5 we shows that the visits were usually up to 20 per day, with a pick on 11th May, 2017 (37). In Figure 6, the temporal distribution of unique visitors is shown. Visits were up to 15 per days (the pick was 34, again on 11th May, 2017, few days after an executive board meeting). There is usually an increment of activities in correspondence to the project meetings and dissemination activities, likely due to updates on the website content to advertise them and upload the related material. The pick of the average duration of visits was on 28th May, 2017, with an average longer than 5 minutes.

Unique page views, from Figure 8, were usually up to 65, with a pick of 98 on 17th Feb, 2018, corresponding to the day of maximum actions in one visit (124, from Figure 9).

Main activity occurs during Europe working time (Figure 10), even if from Figure 11 and Figure 12 the website is accessed often also from outside Europe. From Figure 11, the countries with higher average time per visit were Nepal (28 min), Brazil (10 min), Czeck Republic (9 min), Equador (7 min), Colombia and Vietnam (6 min).

From Figure 13, it can be seen as most of the visits to the website were originated from partners personal pages (27%) or from datAcron events' websites (52%).
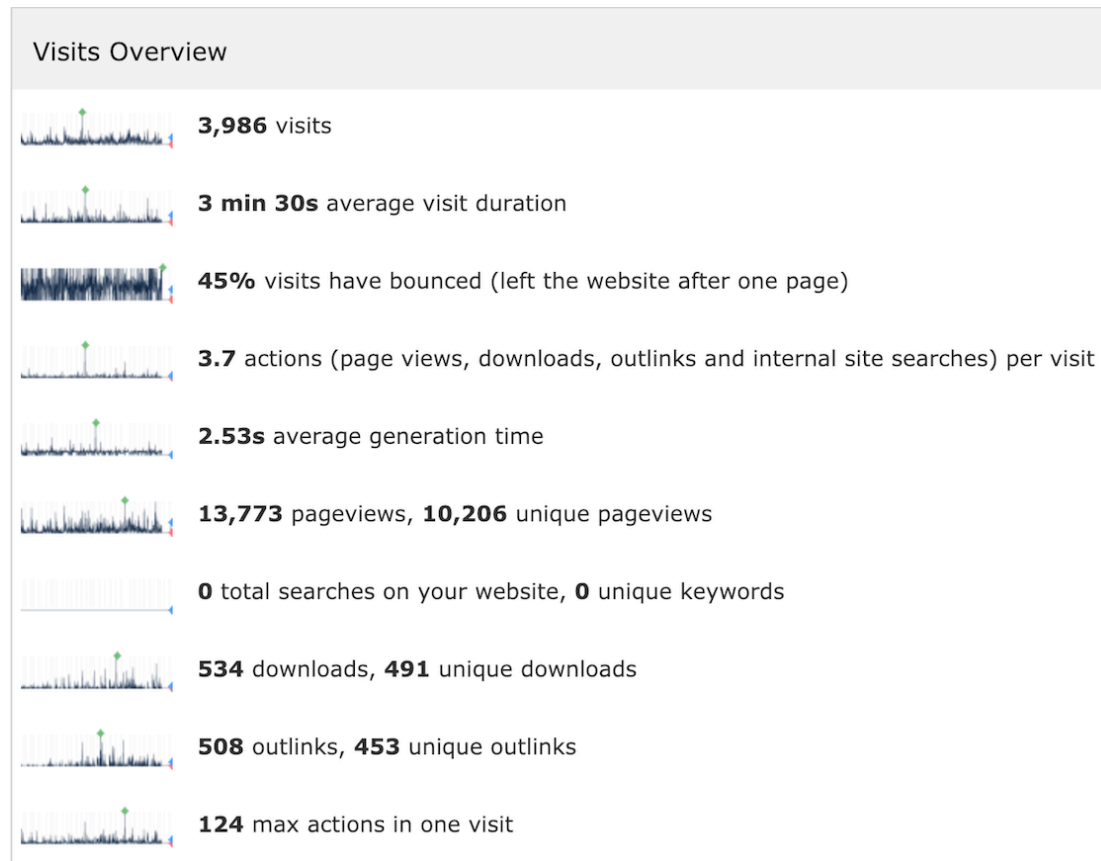
Visits Overview

3,986 visits

3 min 30s average visit duration

45% visits have bounced (left the website after one page)

3.7 actions (page views, downloads, outlinks and internal site searches) per visit

2.53s average generation time

13,773 pageviews, **10,206** unique pageviews

0 total searches on your website, **0** unique keywords

534 downloads, **491** unique downloads

508 outlinks, **453** unique outlinks

124 max actions in one visit

Figure 4 www.datAcron-project.eu analytics: Visits overview (period: 1st of April 2016 – 20th December 2018)
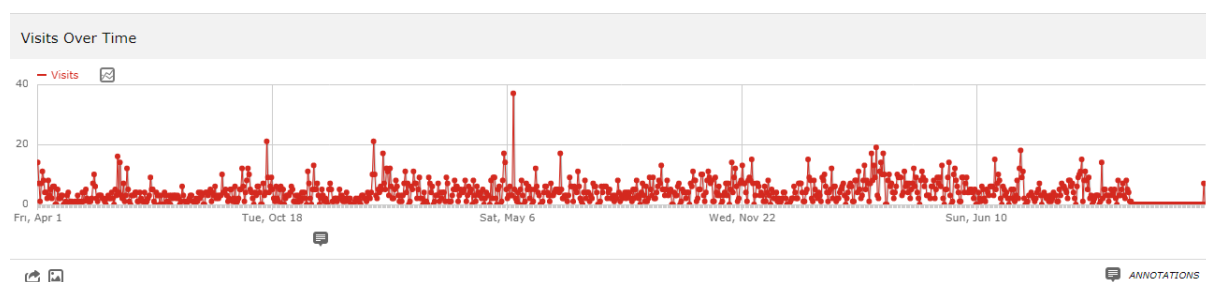
Visits Over Time

Figure 5 www.datAcron-project.eu analytics: Visits over time (period: 1st of April 2016 – 20th December 2018)
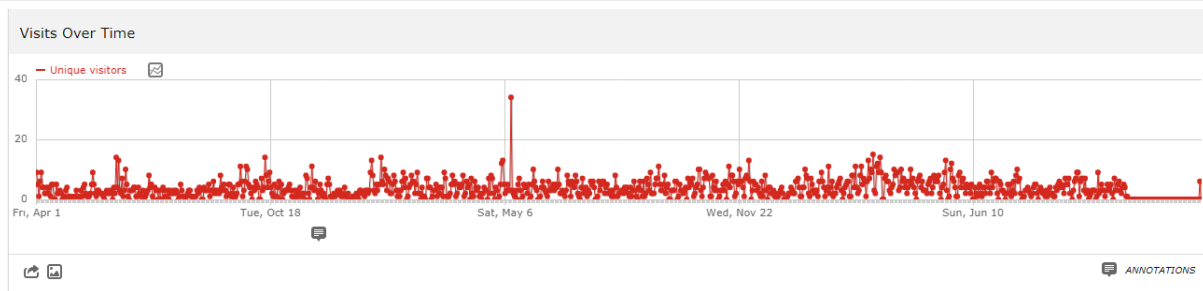
Figure 6 www.datAcron-project.eu analytics: Unique visitors over time (period: 1st of April 2016 – 20th December 2018)
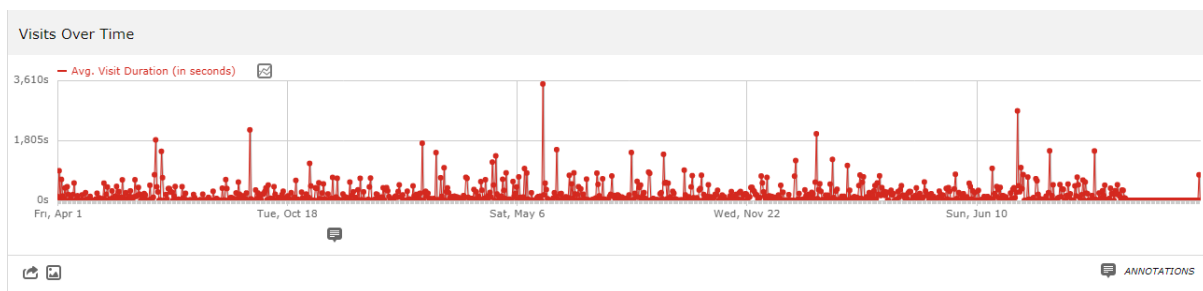

Figure 7 www.datAcron-project.eu analytics: Average time per visits over time (period: 1st of April 2016 – 20th December 2018)
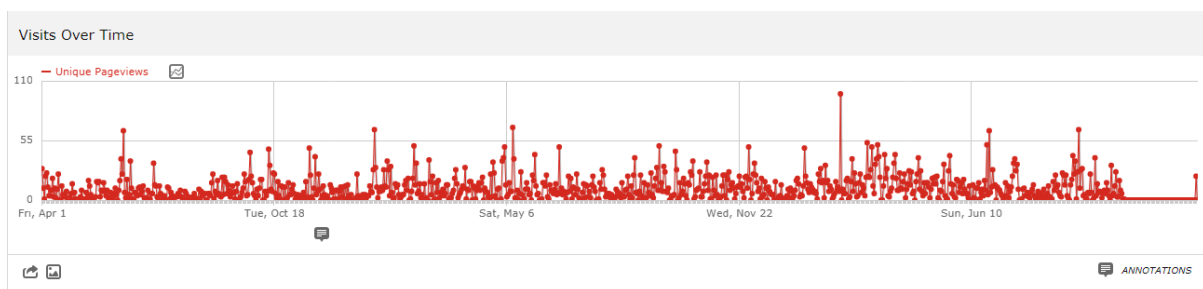

Figure 8 www.datAcron-project.eu analytics: Unique pageviews over time (period: 1st of April 2016 – 20th December 2018)
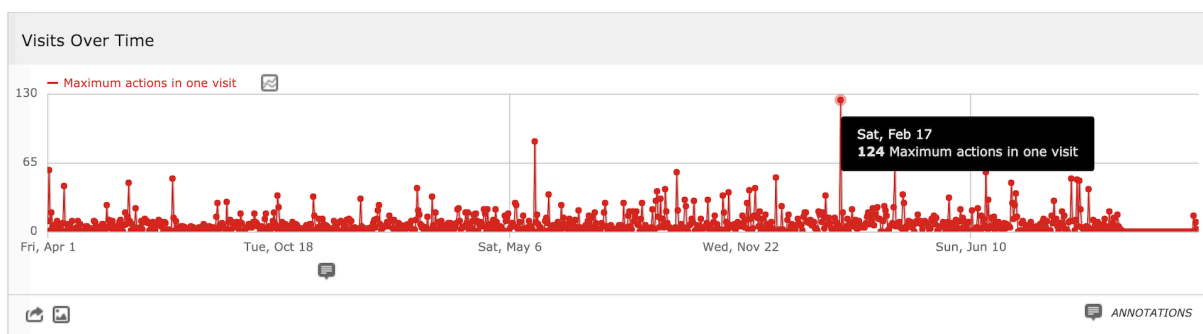

Figure 9 www.datAcron-project.eu analytics: Maximum actions in one visit over time (period: 1st of April 2016 – 20th December 2018)
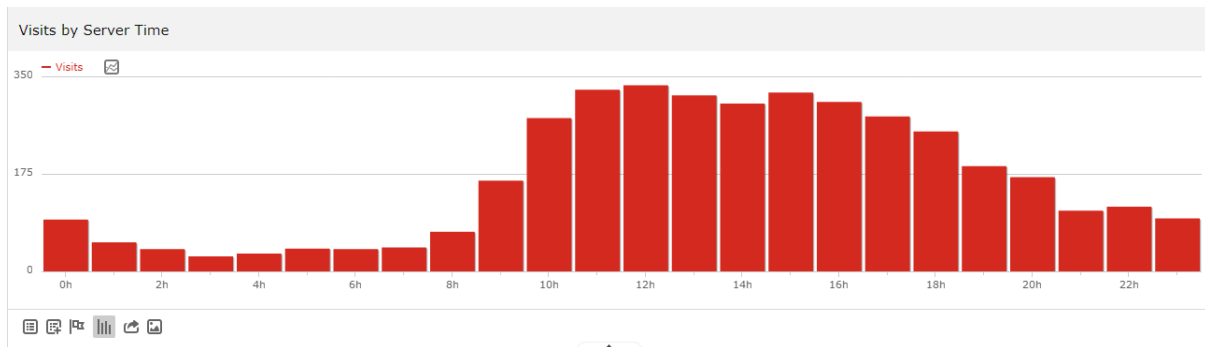
Figure 10 www.datAcron-project.eu analytics: Visits by server time (period: 1st of April 2016 – 20th December 2018)
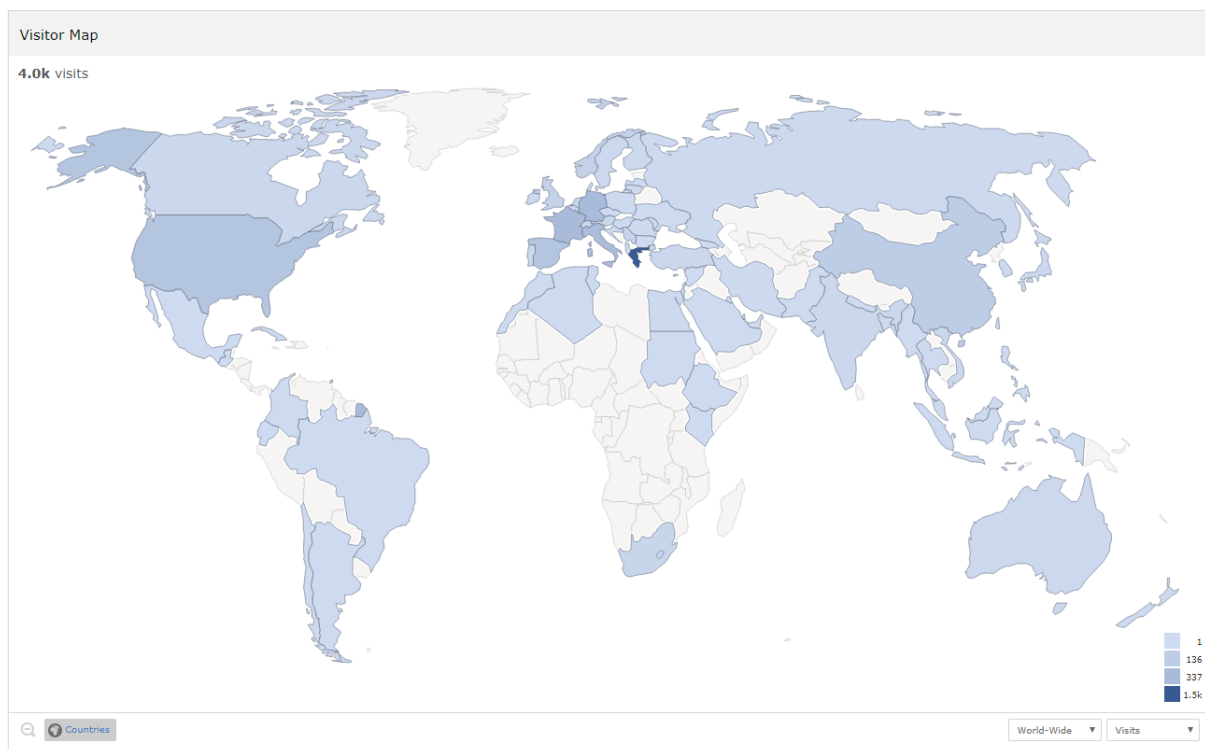

Figure 11 www.datAcron-project.eu analytics: Visitors' map (period: 1st of April 2016 – 20th December 2018)
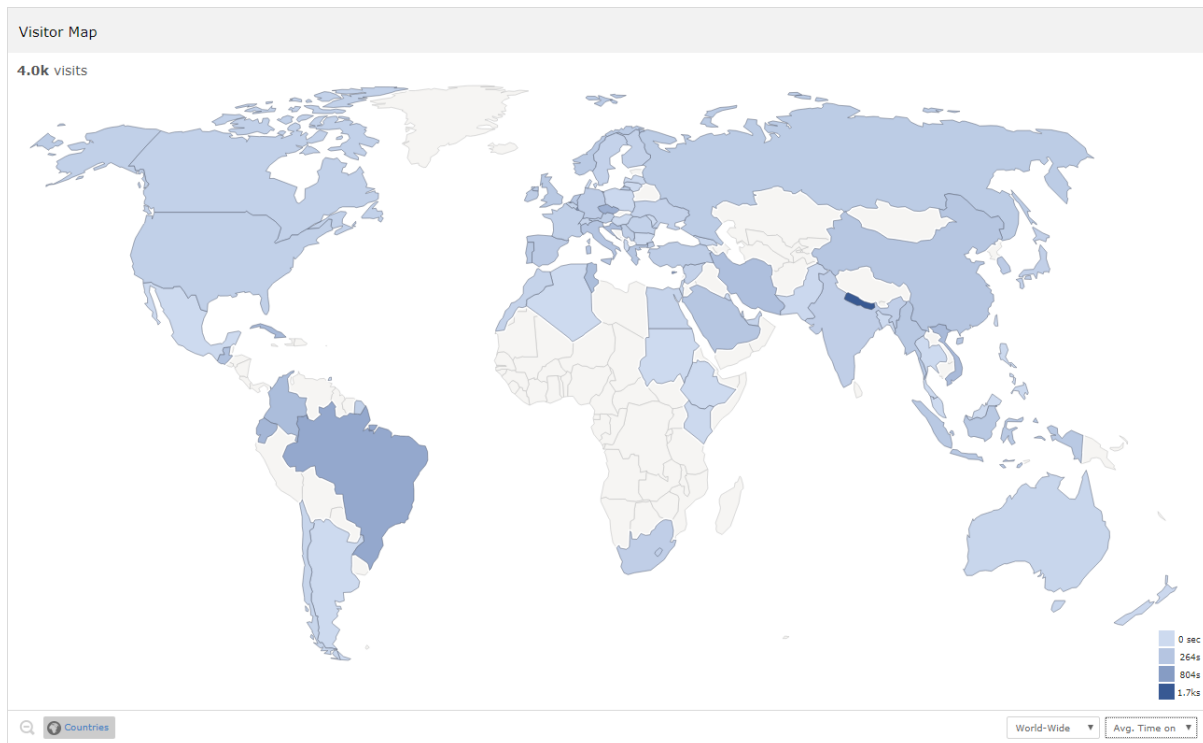
Figure 12 www.datAcron-project.eu analytics: Average time of visits' map (period: 1st of April 2016 – 20th December 2018)
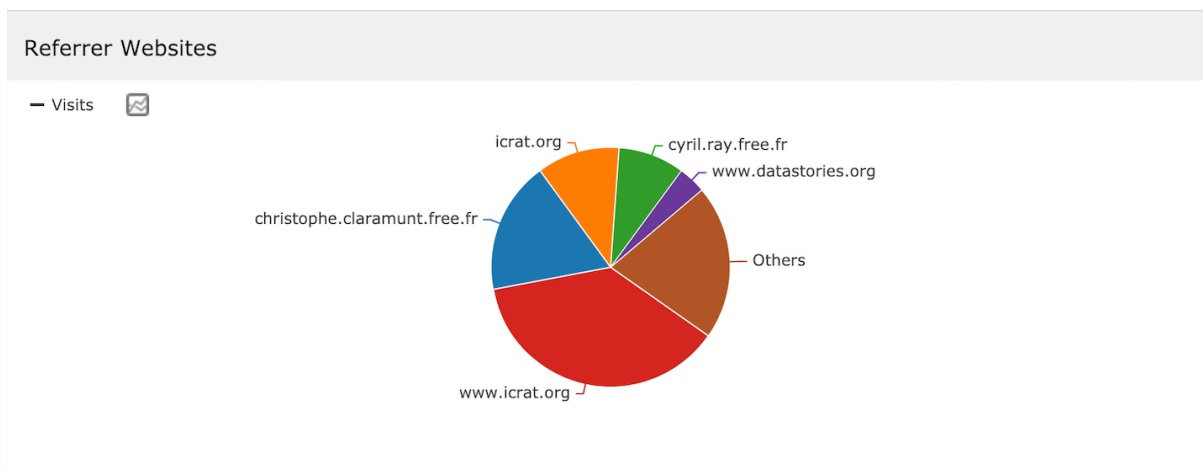

Figure 13 www.datAcron-project.eu analytics: Referred websites (period: 1st of April 2016 – 20th December 2018)

4.1 Social media

Related material: Social media profiles for project dissemination and communication with branded imagery and logos, updated with consortium-sourced content
Additional features: Along the course of the project, other social media channels were registered, and the existing ones adapted to increase project visibility
Delivered: M03

The **datAcron** project has established three social media channels (one was removed):
- a Twitter profile @datacron_eu
- a ResearchGate project https://www.researchgate.net/project/H2020-EU-datAcron-at-http-datacron-projecteu
- a Zenodo community https://zenodo.org/communities/h2020_datacron/?page=1&size=20

The Twitter profile was managed by the WP7 coordinator and used to promote project activities, retweet of content of interests for networking with related projects and initiatives, news on project topics, and creating live chronicles during project events. The consortium partners provided content and contributed to advertising project news, events and achievements through their personal networks.
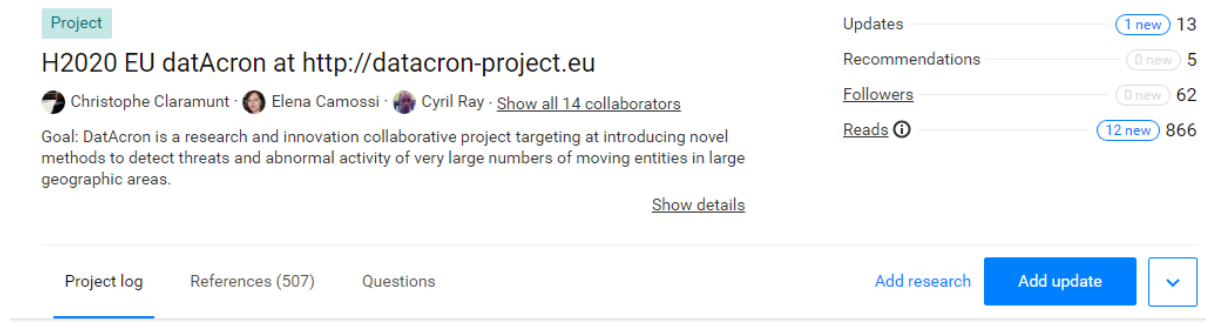

Figure 14 datAcron project on Research Gate

The ResearchGate, involving academic project partners, was meant to leverage the personal professional networks of project partners, inserting updates on the projects and uploading relevant publications.
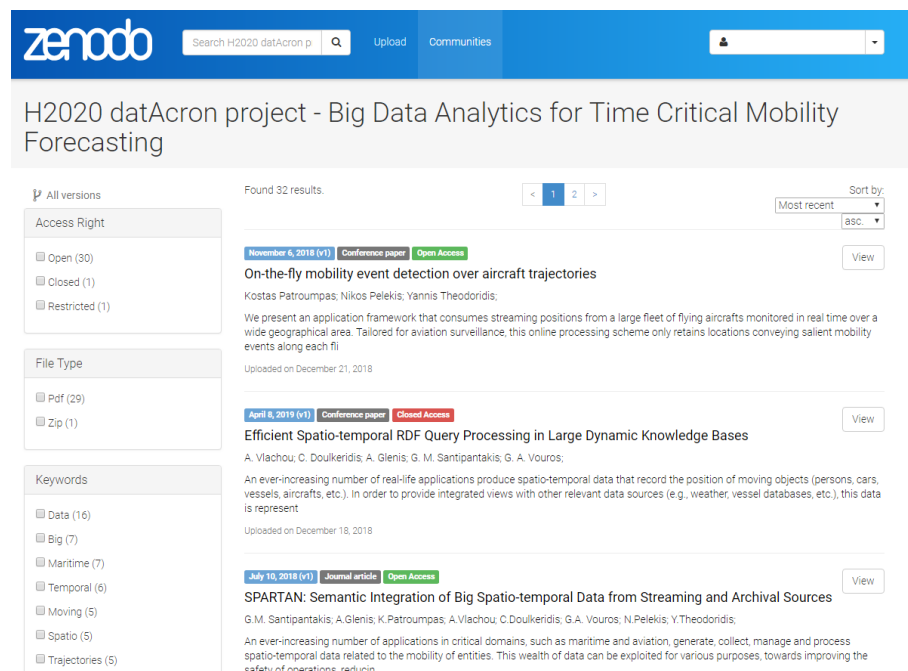
Figure 15 The datAcron Zenodo community

The **datAcron** Zenodo community has been created for hosting and easy sharing of open access project publications and related material (presentation, software, datasets), enhancing the visibility of the **datAcron** scientific achievements. Moreover, DOI were created for publications and content as necessary, improving author recognition, and each contribution was directly linked to the **datAcron** grant during insertion, enabling direct reference in CORDIS.

4.2 Media engagement and printed materials

Related material: Media coverage of relevant project events, preparing material (brochures, videos, flyers and posters) to be displayed and distributed at relevant events and online to facilitate media engagement; publications in project dissemination journals**,** publicity material (posters, flyers, videos, presentations) addressing broad communities.

Target audience: broad community

Estimated budget: Leaflets, brochures printing: from 1,10 to 1,50 euro each. Poster printing from 5-6 euros /m2; Pool Tent 4mx4m 200-300 euro, Pool Panels: 80-350 euros

Media engagement activities were organised together with important project milestones, workshops and events open to specialised communities, to promote awareness on the project approaches, developments and results.

One video interview presenting the project has been delivered to present an open session organised at a scientific event (video is available on the web, https://vimeo.com/161443056) 3 other scientific videos are also available.

A project flyer and a brochure have been prepared and distributed at project events and other dissemination opportunities. The brochure includes a technical paper, prepared for an enlarged technical and research community, presenting the project and including an interview of the dAtAcron Project coordinator. The same brochure, as a broad audience article to be delivered to research institutions across Europe, has been published by Impact European Research Fostering Open Science journal (https://impact.pub).

Scientific posters have been prepared for presenting scientific achievements in two scientific events, and have been used for showcasing project achievements during jointly organised events (e.g., in pools).

An additional flyer has been prepared to promote an open dataset prepared and delivered for training the project developments.

Project Presentations to media

1. Christophe Claramunt, interview with brest.fr and presentation of the datAcron Open Session at Sea Tech Week Event (**video available** at https://vimeo.com/161443056)

Publicity publications

1. "Adding significant value to real-time tracking and forecasting mobility", in Impact - European Research Fostering Open Science journal
2. "Big Data heralds new era for time-critical mobility forecasting and situation awareness", Interview to datAcron project coordinator in Impact - European Research Fostering Open Science journal.

Printed material: posters, flyers, brochures

1. "dAtAcron: Big Data Analytics for Time Critical Mobility Forecasting" (flyer)
2. Cyril Ray, Richard Dréo; Elena Camossi, Anne-Laure Jousselme: Heterogeneous Integrated Dataset for Maritime Intelligence, Surveillance, and Reconnaissance (flyer), delivered at Euronaval 2018
3. C. Claramunt, C. Ray, E. Camossi, A-L. Jousselme, M. Hadzagic, G. Andrienko, N. Andrienko, Y. Theodoridis, G. Vouros, L. Salmon : "Maritime data integration and analysis: recent progress and research challenges [Vision paper]", Poster presented at the 20th International Conference on Extending Database Technology (EDBT 2017), Venice, Italy, March 21-24, 2017
4. G. M. Santipantakis, G. A. Vouros, A. Glenis, C. Doulkeridis, A. Vlachou: "The datAcron Ontology for Semantic Trajectories" Poster presented at the 14th European Semantic Web Conference (ESWC 17), Portoroz, Slovenia, May 28 - June 1 2017
5. M. Zocholl, E. Camossi, A-L. Jousselme, C. Ray: Ontology-based Design of Experiments on Big Data Solutions, Poster presented at SEMANTICS 18 14th int'l Conference on Semantic Systems https://2018.semantics.cc/, Vienna, Austria, Sept 10-13, 2018

Other video contributions available online

1. D. Scarlatti: "Big Data Analytics for Time Critical Mobility Forecasting" Complex World Event, Data Science in Aviation Workshop, Cologne, Germany, September 8-9 2016. (**Video available:** https://vimeo.com/album/4328818/video/197373375)

2. Scientific video and media from G. Andrienko, N. Andrienko, G. Fuchs, J. M. Cordero Garcia: "Clustering Trajectories by Relevant Parts for Air Traffic Analysis", In IEEE Transactions on Visualization and Computer Graphics 2018, vol. 24(1), presented at the EEE Conference on Visual Analytics Science and Technology (IEEE VAST 2017), Phoenix, Arizona, USA, 1-6 October 2017 (**Video available**: https://vimeo.com/groups/480818/videos/230830419)

3. Video demonstrating P. Tampakis, N. Pelekis, N. Andrienko, G. Andrienko, G. Fuchs and Y. Theodoridis, "Time-Aware Sub-Trajectory Clustering in Hermes@PostgreSQL," 2018 IEEE 34th International Conference on Data Engineering (ICDE), Paris, France, Apr 16- 19, 2018, pp. 1581-1584. doi:10.1109/ICDE.2018.00181, (**Video available**: http://www.datastories.org/hermes/demo/)
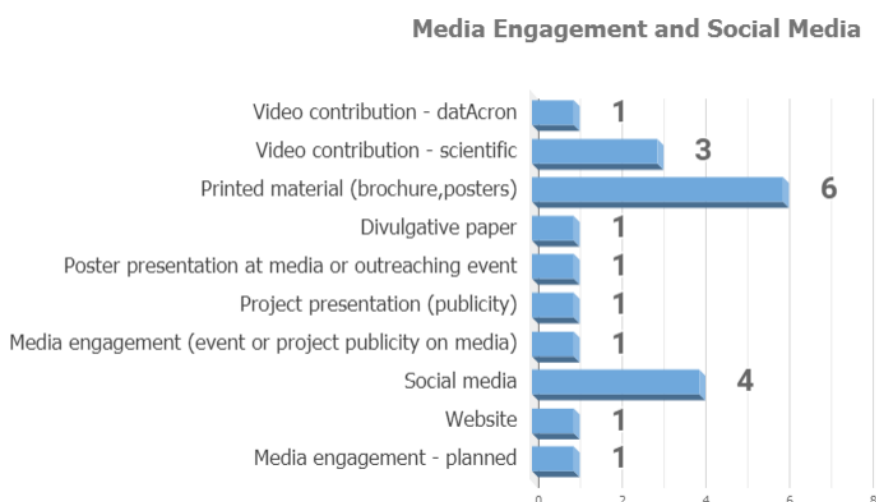

Figure 16 Media Engagement, Social Media, Printed Material (detail)

4.3 Organisation of scientific workshops and specialised events

Related material: Scientific and technical workshops and open sessions on project topics, organised at scientific and technical or industrial events and by partner premises.
Target audience: Scientific and research community**,** Industrial and technical community
Additional features: Need templates, posters, brochures, demos, gadgets
Planned target: 6 workshops

A total of 10 workshops and open sessions on project topics have been organized: 8 along the duration of the project (5 scientific and 1 standardisation workshops), and 2 will be held after the end of the project (1 in 2019 and 1 in 2020, both already confirmed). In addition, 2 additional workshops, as a continuation of events already organized, are planned in 2019.
Big data workshops have been colocated with major Database conferences (VLDB 2017 and 2018, EDBT2018), while specific workshops and open session have been organized to discuss domain related maritime and aviation big data at specialized scientific and industrial events (SeaTech2016, ICRAT 2018) and by partners premises (MBDW).
Some of these workshops have already established as series (MATES and BMDA, colocated respectively with VLDB and EDBT). Also, the attendance to the domain related big data workshops exceeded the expectations. For instance, ICRAT 2018 workshop on Data-Enhanced Trajectory Based Operations for ATM had 47 registrations, but the average attendance was around 50 people (with peaks of over 60 participants), including Industry, civil aviation authorities, ANSP's, Airlines, Pilots, Eurocontrol and FAA representatives and research institutes all around the globe, with a big presence of researchers and students from Asian universities.
The Maritime Big Data Workshop (BMDW) gathered 37 attendees (from 9 different countries: Brazil, Canada, France, Germany, Greece, Italy, Portugal, South Africa, Vietnam), including researchers and representatives of inter-government organizations, industry and technology providers, representatives of the operational community (IT Navy, MARCOM), to discuss Operational Systems, Big Data Analytics, Risk Analysis for Maritime Surveillance, Big Data Analytics for Environmental Applications Maritime Data Management and Harmonization initiatives. 6 European projects on Big Data and Policy Making for Maritime have been presented (presentations are available at http://www.cmre.nato.int/maritime-big-data-workshop-

presentations). Considering the success of the initiatives, a second MBDW is planned in 2019, and an "analytics for ATM workshop" will be proposed and colocated with World ATM Congress 2019.

Workshops and open sessions

1. **datAcron** Project Open Session at SeaTech week 2016, Brest, France, 13 October 2016
2. Challenges to Exploit Big Maritime Data, Open Session at Hellenic Forum 2017, June 2017.
3. Mobility Analytics for Spatio-temporal and Social Data (MATES) Workshop, co-located with Very Large Database (VLDB'17) conference (http://www.vldb.org/2017/), Munich, 1 Sep, 2017. Workshop web page: http://ai-group.ds.unipi.gr/mates17/
4. Maritime standardisation workshop, IIT, NCRS'D, Athens, Greece, 19 January 2018
5. Big Mobility Data Analytics (BMDA), workshop co-located with EDBT/ICDT 2018 Joint Conference 21st International Conference on Extending Database Technology Vienna, Austria March 26-29, 2018 http://www.datastories.org/bmda18/
6. Maritime Big Data Workshop (MBDW), CMRE, La Spezia, Italy, 9-10 May 2018
7. Data-Enhanced Trajectory Based Operations, co-located with ICRAT 18, Barcelona June 25 2018 by UPC
8. Mobility Analytics for Spatio-temporal and Social Data (MATES) Workshop, co-located with VLDB'18 conference, Rio de Janeiro, Brazil, from August 27th to August 31st, 2018. http://ai-group.ds.unipi.gr/mates18/
9. Big Mobility Data Analytics 2019 (BMDT 2019) http://www.datastories.org/bmda19/ colocated with EDBT: 22nd International Conference on Extending Database Technology, March 26-29, 2019 http://edbticdt2019.inesc-id.pt/
10. Alexander Artikis, Thomas Eiter, Alessandro Margara, Stijn Vansummeren: Foundations of Composite Event Recognition, Dagstuhl-Seminar. Schloss Dagstuhl – Leibniz Center for Informatics, 09. – 14. February 2020, Dagstuhl-Seminar 20071,
https://www.dagstuhl.de/no_cache/en/program/calendar/semhp/?semnr=20071
11. Analytics for ATM workshop colocated with World ATM Congress 2019 March 12th-14th (Madrid) https://www.worldatmcongress.org/exhibitor-info (planned)
12. 2nd Maritime Big Data Workshop (MBDW 2019), Brest, France (planned)

Figure 17 Scientific and Industrial Workshops and Open Sessions (detail)

4.4 Scientific publications and presentations at conferences

Related material: Peer-review papers in high-impact scientific journals and in conference proceedings, presented at relevant events on Big-Data Analytics, Interactive Visual Analytics, Machine Learning, Data and Information management, Semantic Web; books and book chapters; scientific presentations at conferences and scientific venues

Target audience: Scientific and research community

Planned target: 10 paper submissions to relevant journals and 20 publications included in proceedings of relevant conferences. Open access to all **datAcron** publications (read, download, print).

All along the duration of the project, the datAcron consortium has been publishing scientific publications targeting Big-Data Analytics, Interactive Visual Analytics, Machine Learning, Data, Information management, Semantic Web, Maritime and Aviation Safety and Security research communities[2].

As specified in the grant agreement, the mandatory statement for acknowledgement is included in all publications, referring explicitly to the grant number, specifically: "*This work was [partially] supported by project* datAcron*, which has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 687591*".

All scientific publications, as per grant agreement (art. 29) are open access. The consortium has adopted multiple sharing solutions for publications; this approach is meant to facilitate the circulation of the publications, which may be hosted on different sites in multiple copies. A datAcron publication may be:

- Open Access: if open access is agreed with the publisher, the main electronic version of the publication is freely accessible directly from the publisher's website
- GREEN Open Access: if the publication camera ready is not open access, the publication's pre-print is hosted on the datAcron website or by a partner institution's repository accessible on the web.
- GOLD Open Access: in the same case as above, the publication's pre-print may be hosted on the datAcron Zenodo community and shared through OpenAIRE

The last solution, in particular, was encouraged because publications can be made directly accessible also trough the CORDIS portal, and it guarantees that the publications will remain freely available also after the conclusion of the project. All publication references are recorded on the project website, at the page Publications. References link to the most convenient repository. Open access publications are be shared also on ReserchGate, linked to the individual partners' profiles and shared through the project page.

The detail of this dissemination activity is given at the end of the section. In summary, at the time this document is delivered, the status of scientific publications and presentations, summarized also in Figure 18 and Figure 19, is as follows:

- **12 journal papers** have been already published or accepted for publication (including a paper in journal conference proceedings), a publication hosted by the Computing Research Repository, and other 5 are under revision
- **28 scientific papers** have been published in conference proceedings (including 2 poster papers, a journal paper on conference proceedings, and abstracts), 2 submitted
- **25 scientific presentations** have been delivered at conferences, workshops, symposiums, including **2 keynote talks** and **3 poster presentations**
- **4 scientific seminars** (upon invitation)
- **1 book** is in preparation, presenting datAcron developments, and another **1** is planned (to be completed by end of 2019)
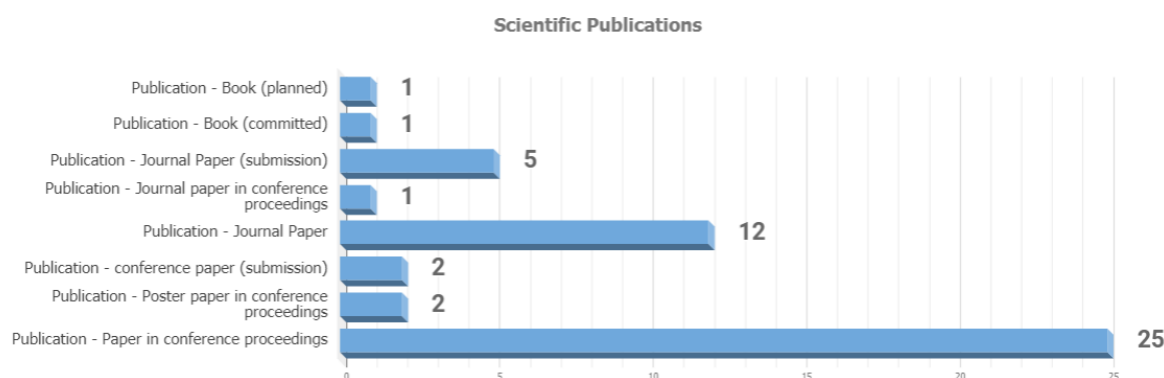

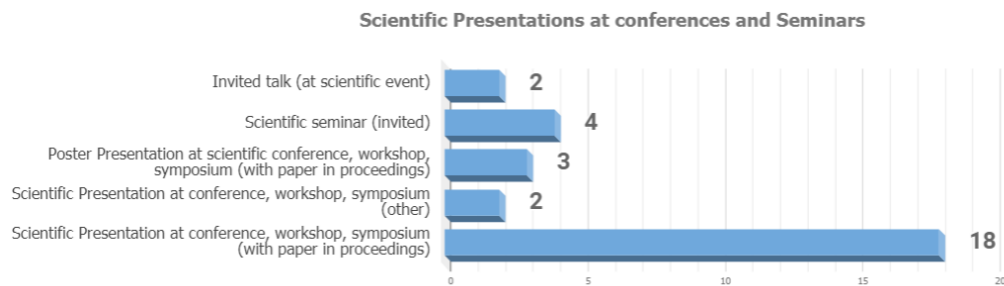**Figure 18 Scientific Publications (detail)**

Figure 19 Scientific presentations and Seminars (detail)

Journal Publications

1. G. Andrienko, N. Andrienko, and G. Fuchs: "Understanding movement data quality", Journal of Location Based Services, Taylor & Francis 2016, 10(1):31-46, DOI: 10.1080/17489725.2016.1169322
2. K. Patroumpas, E. Alevizos, A. Artikis, M. Vodas, N. Pelekis, Y. Theodoridis: "Online Event Recognition from Moving Vessel Trajectories", GeoInformatica 21:389–427, SpringerLink 2016.
3. N. Pelekis, S. Sideridis, P. Tampakis, Y. Theodoridis: "Simulating our LifeSteps by Example", ACM Transaction. Spatial Algorithms Systems, ACM 2016, 2(3)
4. S. Sideridis, N. Pelekis, Y. Theodoridis: "On Querying and Mining Semantic-aware Mobility Timelines" International Journal of Data Science and Analytics, 2(1), 29-44, SpringerLink 2016
5. N. Andrienko, G. Andrienko, E. Camossi, C. Claramunt, J. M. Cordero Garcia, G. Fuchs, M. Hadzagic, A-L. Jousselme, C. Ray, D. Scarlatti, G. Vouros: "Visual exploration of movement and event data with interactive time masks", Visual Informatics 1(1):25-39
6. N. Pelekis, Panagiotis Tampakis, Marios Vodas, Christos Doulkeridis, Y. Theodoridis: "On Temporal-Constrained Sub-Trajectory Cluster Analysis", Data Mining and Knowledge Discovery Journal, Springer 2017
7. G. Andrienko, N. Andrienko, W. Chen, R. Maciejewski, Y. Zhao: "Visual Analytics for Transportation: State of the Art and Further Research Directions", IEEE Transactions on Intelligent Transportation Systems.
8. A. S. Furtado, V. Bogorny, L. O. Alvares, N. Pelekis, Y. Theodoridis: "Unveiling Movement Uncertainty for Robust Trajectory Similarity Analysis",International Journal of Geographical Information Science Volume 32, 2018 - Issue 1, Taylor and Francis 2017, https://doi.org/10.1080/13658816.2017.1372763
9. G. Andrienko, N. Andrienko, G. Fuchs, J. M. Cordero Garcia: "Clustering Trajectories by Relevant Parts for Air Traffic Analysis". In IEEE Transactions on Visualization and Computer Graphics 2018, (presented at the EEE Conference on Visual Analytics Science and Technology (IEEE VAST 2017), Phoenix, Arizona, USA, 1-6 October 2017. Journal proceedings), 2018, vol. 24(1),
10. E. Alevizos, A. Skarlatidis, A. Artikis, G. Paliouras. Probabilistic Complex Event Recognition: A Survey. ACM Surveys. Volume 50 Issue 5, November 2017, ACM, 2017
11. Georgios M. Santipantakis, Christos Doulkeridis, George A. Vouros, Akrivi Vlachou:
    MaskLink: Efficient Link Discovery for Spatial Relations via Masking Areas. CoRR abs/1803.01135 (2018)
12. N. Katzouris, A. Artikis, G. Paliouras, Parallel Online Event Calculus Learning for Complex Event Recognition, Future Generation Computing Systems, Elsevier, 2018
13. G.M. Santipantakis, A.Glenis, K.Patroumpas, A.Vlachou, C.Doulkeridis, G.A. Vouros, N.Pelekis, Y.Theodoridis: SPARTAN: Semantic Integration of Big Spatio-temporal Data from Streaming and Archival Sources, in Future Computer Generation Systems (Elsevier), 2018
14. P.Nikitopoulos, A.Vlachou, C.Doulkeridis, G.A.Vouros: Parallel and Scalable Processing of Spatio-temporal RDF Queries using Spark (under review)
15. E Michelioudakis, A Artikis, G, Paliouras, Semi-supervised online structure learning for Composite Event Recognition (under review, submitted to Machine Learning)
16. Qadah, Moch, Alevizos, Fuchs, Distributed Online Learning For Pattern Prediction over Massive Spatial Event Streams (under review, submitted to Springer Geoinformatica)
17. Makris, Artikis, Paliouras, A Probabilistic Interval-based Event Calculus, (Under review, submitted to Annals of Mathematics and Artificial Intelligence)

Other scientific publications in conference and workshop proceedings (with presentations)

1. G. Andrienko, N. Andrienko, C. Claramunt, G. Fuchs, C. Ray: "Visual Analysis of Vessel Traffic Safety by Extracting Events and Orchestrating Interactive Filters" In proceedings of Maritime Knowledge Discovery and Anomaly Detection Workshop, Ispra, Varese, Italy, July 5-6 2016. p. 44-47.

2. A.-L. Jousselme , E. Camossi , M. Hadzagic , C. Ray, C. Claramunt, E. Reardon , K. Bryan , M. Ilteris, "A Fishing Monitoring Use Case in support of collaborative research". In proceedings of Maritime Knowledge Discovery and Anomaly Detection Workshop, Ispra, Varese, Italy, July 5-6 2016. p. 57-61.

3. M. Hadzagic and A.-L. Jousselme, "Contextual Anomalous Destination Detection for Maritime Surveillance". In proceedings of Maritime Knowledge Discovery and Anomaly Detection Workshop, Ispra, Varese, Italy, July 5-6 2016. p. 62-65.

4. M. Hadzagic and A.-L. Jousselme, "Where is it sailing to: Benefits of Contextual and Prediction Information in Detecting Anomalous Destination (Abstract)" Decision Support and Risk Assessment for Operational Effectiveness (DeSRA) Conference, La Spezia, Italy, July 26-28 2016 http://www.cmre.nato.int/employment/current-vacancies/doc_download/1044-abstracts-from-the-decision-support-and-risk-assessment-for-operational-effectiveness-desra-2016-conference

5. L. Salmon, C. Ray, C. Claramunt: "Continuous detection of Black Holes for moving objects at sea" 7th ACM SIGSPATIAL International Workshop on GeoStreaming (IWGS'16), Burlingame, CA, USA, 31st October 2016.

6. C. Claramunt, C. Ray, E. Camossi, A-L. Jousselme, M. Hadzagic, G. Andrienko, N. Andrienko, Y. Theodoridis, G. Vouros, L. Salmon : "Maritime data integration and analysis: recent progress and research challenges [Vision paper]", In proceedings of the 20th International Conference on Extending Database Technology (EDBT 2017), Venice, Italy, March 21-24, 2017

7. C. Doulkeridis, N. Pelekis, Y. Theodoridis, and George Vouros: "Big Data Management and Analytics for Mobility Forecasting in datAcron", in proceedings of EuroPro workshop at EDBT/ICDT: "Big Data Management Challenges and Solutions in the Context of European Projects, Venice, italy, March 21, 2017.

8. G. A. Vouros; C. Doulkeridis; G. Santipantakis; A. Vlachou: "Taming big maritime data to support analytics", In proceedings of the 8th International Symposium "Information Fusion and Intelligent Geographical Information Systems 2017" (IF&IGIS'17), Shangai, China, May 10-12, 2017 **(Invited talk)**

9. G. M. Santipantakis, G. A. Vouros, A. Glenis, C. Doulkeridis, A. Vlachou: "The datAcron Ontology for Semantic Trajectories" *Poster paper* in Proceedings of the 14th European Semantic Web Conference (ESWC 17), Portoroz, Slovenia., May 28 - June 1 2017

10. E. Alevizos, A. Artikis, G. Paliouras: "Event Forecasting with Pattern Markov Chains". In Proceedings of the 11th ACM International Conference on Distributed and Event-Based Systems (DEBS17), Barcelona, Spain, 19-23 June, 2017

11. N. Katzouris, A. Artikis, G. Paliouras. Parallel Online Learning of Complex Event Definitions. 2017 International Conference on Inductive Logic Programming (ILP2017), Orléans - France, 4-6 September 2017

12. G. M. Santipantakis, G. A. Vouros, C. Doulkeridis, A. Vlachou, G. Andrienko, N. Andrienko, J.M.Cordero, M.G. Martinez: "Specification of Semantic Trajectories and Data Transformations for Analytics: The datAcron Ontology". In Proceedings of SEMANTiCS 2017, Amsterdam, The Netherlands, 11-14 September 2017

13. C Vlassopoulos, A Artikis, "Towards A Simple Event Calculus for Run-Time Reasoning", Thirteenth International Symposium on Commonsense Reasoning, University College London, November 6-8, 2017

14. G. A. Vouros, A. Vlachou, G. Santipantakis, C. Doulkeridis, N. Pelekis, H. Georgiou, Y. Theodoridis, K. Patroumpas, E. Alevizos, A. Artikis, G. Fuchs, M. Mock, G. Andrienko, N. Andrienko, C. Claramunt, C. Ray, E. Camossi, A-L. Jousselme, D. Scarlatti, J. M. Cordero: "Big Data Analytics for Time Critical Mobility Forecasting: Recent Progress and Research Challenges", Extending Database Technology, EDBT/ICDT 2018 Joint Conference 21st International Conference on Extending Database Technology Vienna, Austria March 26-29, 2018

15. E. Qadah, M. Mock, E. Alevizos, G. Fuchs: "A Distributed Online Learning Approach for Pattern Prediction over Movement Event Streams with Apache Flink". Big Mobility Data Analytics Workshop (BMDA), March 26, 2018 , Vienna, Austria, co-located with EDBT/ICDT 2018 Joint Conference 21st International Conference on Extending Database Technology Vienna, Austria

16. P. Nikitopoulos, A. Vlachou, C. Doulkeridis, G. A. Vouros "DiStRDF: Distributed Spatio-temporal RDF Queries on Spark". Big Mobility Data Analytics Workshop (BMDA), March 26, 2018 , Vienna, Austria, co-located with EDBT/ICDT 2018 Joint Conference   21st International Conference on Extending Database Technology Vienna, Austria

17. W. Kleynhans: "Big data for Maritime Domain Awareness - an AIS case study" (abstract), Maritime Big Data Workshop", CMRE, La Spezia, Italy, 9-11 May 2018

18. E. Alevizos and A. Artikis: "A Prototype for Maritime Event Forecasting" (abstract), Maritime Big Data Workshop", CMRE, La Spezia, Italy, 9-11 May 2018

19. M. Zocholl, E. Camossi and A-L. Jousselme: "Test case development for big data solution evaluation" (abstract), Maritime Big Data Workshop, CMRE, La Spezia, Italy, 9-11 May 2018

20. C. Iphar, A-L Jousselme and C. Ray: "Data degradation variations for maritime situational indicator prediction assessment" (abstract), Maritime Big Data Workshop, CMRE, La Spezia, Italy, 9-11 May 2018

21. G. A. Vouros, A. Viachou, G. Santipantakis, G. Doulkeridis, N. Pelekis, H. Georgiou, Y. Theodoridis, K. Patroumpas, E. Alevizos, A. Artikis, G. Fuchs, M. Mock, G. Andrienko, N Andrienko, C. Claramunt, C. Ray, E. Camossi and A.-L. Jousselme: "Increasing Maritime Situation Awareness via Trajectory Detection, Enrichment and Recognition of Events", W2GIS 2018: 16th International Symposium on Web and Wireless Geographical Information Systems 2018, Coruña, Spain, May 21-22, 2018

22. G. M. Santipantakis, K. I. Kotis, G. A. Vouros, C. Doulkeridis: "RDF-Gen: Generating RDF from Streaming and Archival Data 8th International Conference on Web Intelligence, Mining and Semantics". (WIMS'18) June 25 – 27 2018, Novi Sad, Serbia

23. M. Pitsikalis, I. Kontopoulos, A. Artikis, E. Alevizos, P. Delaunay, J-E. Pouessel, R. Dreo, C. Ray, E. Camossi, A-L. Jousselme, M. Hadzagic: "Composite Event Patterns for Maritime Monitoring", In Proceedings of 10th Hellenic Conference on Artificial Intelligence SETN2018, 9-15 July, Patras, Greece

24. M. Zocholl, E. Camossi, A-L. Jousselme, C. Ray: Ontology-based Design of Experiments on Big Data Solutions, Poster paper at SEMANTICS 18 14th int'l Conf on Semantic Systems https://2018.semantics.cc/, Vienna, Austria, Sept 10-13, 2018

25. G. M. Santipantakis, A. Vlachou, C. Doulkeridis, A. Artikis, I. Kontopoulos, G. A. Vouros: A Stream Reasoning System for Maritime Monitoring 25th International Symposium on Temporal Representation and Reasoning (TIME 2018), Warsaw, Poland 15-17 October 2018, 20:1–20:17

26. K. Patroumpas, N. Pelekis, and Y. Theodoridis: "On-the-fly Mobility Event Detection over Aircraft Trajectories". In proceeding of the 26th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL 2018), November 6 - 9, 2018 Seattle, Washington, USA

27. A. Alevizos, A. Artikis, Paliouras: "Wayeb: a Tool for Complex Event Forecasting", in proceeding of the 22nd International Conference on Logic for Programming Artificial Intelligence and Reasoning (LPAR-22). Awassa, Ethiopia, 16-21st November 2018 https://easychair.org/publications/open/VKP1ù

Submission to conferences, workshops, symposiums

1. P. Tampakis, C.Doulkeridis, N.Pelekis, Y.Theodoridis: Distributed Trajectory Join Processing Using MapReduce (Submitted)

2. Vlachou, C. Doulkeridis, A. Glenis, G.M. Santipantakis, G.A. Vouros: Efficient Spatio-temporal RDF Query Processing in Large Dynamic Knowledge Bases - (Submitted)

3. Iphar, C, Jousselme, A.-L., Ray, C. : Pseudo-synthetic datasets in support to maritime surveillance algorithms assessment – (Submitted)

Additional Scientific Presentations delivered conferences, workshops, symposiums

1. G. Andrienko, N. Andrienko, C. Claramunt, G. Fuchs, C. Ray: "Understanding movement data quality (abstract)" (VCMA 2016), co-located with the 19th AGILE Conference on Geographic Information Science AGILE 2016: Geospatial Data in a Changing World. 14 June 2016, Helsinki, Finland

2. Ernie Batty: "Data Analytics enables advanced AIS applications". Keynote talk at Mobility Analytics for Spatio-temporal and Social Data (MATES) Workshop, co-located with VLDB'17 conference, Munich, 1 Sep, 2017 **(Invited talk)**

Scientific Seminars (invited)

1. Y. Theodoridis: "datAcron: Big Data Analytics for Time Critical Mobility Forecasting – a Horizon2020 Big Data project", ETH Zurich, January 2016
2. C. Claramunt: Exploring Big Data in the Maritime Domain, East China Normal University, China, 8 March 2018
3. C. Claramunt: Exploring Big Data in the Maritime Domain, Shanghai Maritime University, China, 14 March 2018
4. C. Claramunt: Progress in Big Data and Location Based Services, Jimei University, Xiamen, China, 19 March 2018 http://saton.jmu.edu.cn/info/1012/1416.htm?from=timeline

Books (in preparation)

1. Zissis, D and Artikis, A (eds) "An introduction to Maritime Informatics", Springer, 2019
2. Vouros, G.A. et al. (eds) "Big Data Analytics for Time Critical Mobility Forecasting" (to be submitted to Springer)

4.5 Demonstrations and presentations to industry, technical publications, open datasets

Related material: Participation and presentation at specialised scientific events and meetings; meetings with stakeholders; demonstrations of prototypes at scientific and industry dominated events; publications for technically interested community at large (e.g., technical publications, demonstration papers, industrial papers, whitepapers)**;** datasets produced during the course of the project and released as open data
Target audience: Scientific, technical and industrial community at large
Planned targets: 3 demonstrations, 9 technical publications and whitepapers; bi-lateral collaborations with other projects working in the field established are measured by existing exchange of knowledge and/or models or implementations.

The datAcron consortium has delivered **8 technical products**, including:
- 1 open dataset (according to the CC-BY-NC-SA 4.0 International Public License)
- 5 demonstration and industrial papers in conference proceedings
- 1 technical publication (another 1 has been submitted).

In particular, the dataset that has been released as open data has been shared through Zenodo to include a DOI for recognition (**permanent DOI: 10.5281/zenodo.1167594**). The dataset has been prepared during the course of the project to support the project developments and its final evaluation. It includes heterogeneous information to stress in particular the veracity and the variety dimensions of Big Data. At the time of writing, it has been downloaded more that **2225 times**. It will be used as reference dataset in the Maritime Informatics book that is under preparation with the collaboration of datAcron partners. A technical journal publication describing the dataset has been submitted and is currently under review for Elsevier Data in Brief. Another technical publication, describing the preparation of parts of the dataset, has been already published in Zenodo.
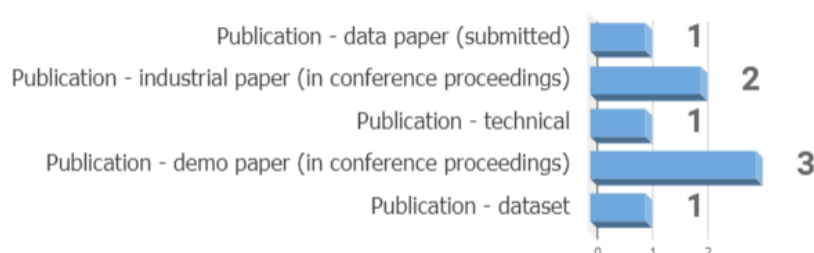
Technical products and publications

Figure 20 Technical products and Publications (detail)

To promote networking and collaboration with industry and with the ATM and Maritime operational communities, **23 presentations** have been delivered at specialists' scientific operational and standardisation events involving stakeholders, and at meetings with stakeholders and interested communities, validating the maritime and aviation use case requirements and prototypes. Fostering bi-lateral collaborations with other European projects, **datAcron** has been presented at European Big Data events (noticeably, at the European Big Data Value Forum 2017), and dedicated meetings and presentations have been delivered along the project. **4 demonstrations** have been organised in order to showcase the technical and scientific advancements of the project in relevant scientific events, including the participation and the award of a scientific challenge (ACM SIGSPATIAL Cup).

As a result of the effort devoted to maritime standardization activities, **datAcron** is currently listed as an active testbed for e-navigation (cf. the IALA-ASIM website https://www.iala-aism.org/technical/e-nav-testbeds/datacron/), recognising that the **datAcron** approach is a viable approach to demonstrate e-navigation concepts.

Specialised Presentations and Meetings

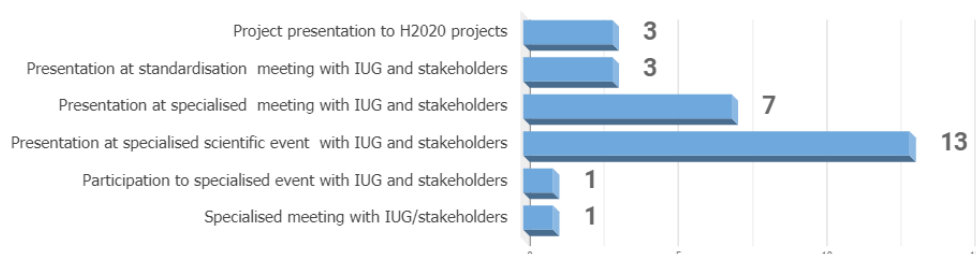
Figure 21 Specialised presentations and meetings with stakeholders (detail)
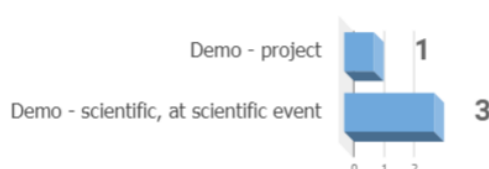
Demonstrations

Figure 22 Demonstrations (detail)

Demo papers and industrial papers (in conference proceedings)

1. P. Nikitopoulos, A.-I. Paraskevopoulos, C. Doulkeridis, N. Pelekis, Y. Theodoridis: "BigCAB: Distributed Hot Spot Analysis over Big Spatio-temporal Data using Apache Spark (GIS Cup)", - 24th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, Burlingame, CA, USA, Oct 31-Nov 3 2016. **Third runner-up award at the 5th ACM SIGSPATIAL Cup**
2. N. Pelekis, P. Tampakis, M. Vodas, C. Panagiotakis, Y. Theodoridis. In-DBMS Sampling-based Sub-trajectory Clustering. Proceedings of the 20th International Conference on Extending Database Technology, EDBT 2017 (Industrial and Applications paper), Venice, Italy, March 21-24, 2017
3. Georgios M. Santipantakis, Apostolos Glenis, Nikolaos Kalaitzian, Akrivi Vlachou, Christos Doulkeridis, George A. Vouros. FAIMUSS: Flexible Data Transformation to RDF from Multiple Streaming Sources. In Proceedings of 21st International Conference on Extending Database Technology (EDBT'18) - Demo track, Vienna, Austria, March 26-29, 2018
4. G. A. Vouros, A. Vlachou, G. Santipantakis, C. Doulkeridis, N. Pelekis, H. Georgiou, Y. Theodoridis, K. Patroumpas, E. Alevizos, A. Artikis, G. Fuchs, M. Mock, G. Andrienko, N. Andrienko, C. Claramunt, C. Ray, E. Camossi, A-L. Jousselme, D. Scarlatti, J. M. Cordero: "Big Data Analytics for Time Critical Mobility Forecasting: Recent Progress and Research Challenges", In proceedings of the 21st International Conference on Extending Database Technology (EDBT/ICDT 2018), Industrial and Applications Paper, Vienna, Austria March 26-29, 2018
5. P. Tampakis, N. Pelekis, N. Andrienko, G. Andrienko, G. Fuchs and Y. Theodoridis, "Time-Aware Sub-Trajectory Clustering in Hermes@PostgreSQL," In proceedings of the 2018 IEEE 34th International Conference on Data Engineering (ICDE), Demo track, Paris, France, 2018, pp. 1581-1584.

Other Demonstrations

1. " datAcron: Mobility at sea and in the air", Demonstration during Open Session at European Big Data Value Forum, Versailles, France, November, 21-23, 2017

Other technical publications

1. Cyril Ray and Arnaud Grancher: Integration of Nautical Charts in Maritime Dataset http://doi.org/10.5281/zenodo.1182539
2. Cyril Ray, Richard Dréo; Elena Camossi, Anne-Laure Jousselme, Clément Iphar: Heterogeneous Integrated Dataset for Maritime Intelligence, Surveillance, and Reconnaissance *(under review, submitted to Elsevier Data in Brief)*

Open datasets

1. Cyril Ray, Richard Dréo; Elena Camossi, Anne-Laure Jousselme, Clément Iphar: Heterogeneous Integrated Dataset for Maritime Intelligence, Surveillance, and Reconnaissance. Zenodo: 10.5281/zenodo.1167594.

Presentations at specialised scientific events with stakeholders

1. G. Fuchs: "EU H2020 Big Data Analytics for Time Critical Mobility Forecasting", WTD 71 - COE CSW Workshop: Impact of Offshore Facilities on Maritime Situational Awareness, Hamburg, Germany, May 3-4 2016
2. M. Hadzagic and A.-L. Jousselme, "Where is it sailing to: Benefits of Contextual and Prediction Information in Detecting Anomalous Destination (Abstract)" Decision Support and Risk Assessment for Operational Effectiveness (DeSRA) Conference, La Spezia, Italy, July 26-28 2016
3. D. Scarlatti: "Big Data Analytics for Time Critical Mobility Forecasting" Complex World Event, Data Science in Aviation Workshop, Cologne, Germany, September 8-9 2016. (**video available** at https://vimeo.com/album/4328818/video/197373375)
4. D. Scarlatti: "Assessment of airline's operational efficiency and ANSP performance in Europe". Boeing Technical Excellence Conference (BTEC) Charleston, USA. May 15-18, 2017.
5. C. Claramunt and C. Ray: "Traitement des données dans le cadre du projet européen datAcron" Journées scientifiques du projet NOUMEA, Brest, France, May 31 - June 1 2017
6. G. Vouros: datAcron - Big Data Analytics for Time Critical Mobility Forecasting: Recent Progress and Research Challenges. Maritime Big Data Workshop, CMRE, La Spezia, Italy, 9 May 2018

7. W. Kleynhans: "Big data for Maritime Domain Awareness - an AIS case study". Maritime Big Data Workshop, CMRE, La Spezia, Italy, 9 May 2018
8. E. Alevizos and A. Artikis: "A Prototype for Maritime Event Forecasting". Maritime Big Data Workshop, CMRE, La Spezia, Italy, 9 May 2018
9. M. Zocholl, E. Camossi and A-L. Jousselme: "Test case development for big data solution evaluation". Maritime Big Data Workshop, CMRE, La Spezia, Italy, 9 May 2018
10. C. Iphar, A-L Jousselme and C. Ray: "Data degradation variations for maritime situational indicator prediction assessment", Maritime Big Data Workshop, CMRE, La Spezia, Italy, 9 May 2018
11. M. Zocholl: "Trajectory based analytics: A Maritime Situation Awareness Perspective". Data-Enhanced Trajectory Based Operations, co-located with ICRAT 18, Barcelona June 25 2018
12. H. Georgiou, N. Pelekis, Y. Theodoridis, G. A. Vouros, "Data-driven Aircraft Trajectory Prediction", Data-Enhanced Trajectory Based Operations", co-located with ICRAT 18, Barcelona June 25 2018
13. G. Santipantakis, C.Doulkeridis, G. A. Vouros, "Big Data Integration and Management for the ATM Domain: The datAcron approach", Data-Enhanced Trajectory Based Operations", co-located with ICRAT 18, Barcelona June 25 2018

Presentations at specialised and standardisation meetings with stakeholders

1. E. Camossi: "Visual Analytics for Maritime Security and Maritime Situational Awareness", which includes a presentation of datAcron project. NATO IST 141/RTG 66 on Exploratory Visual Analytics, First meeting. NATO CSO, Paris, France, 26-29 April 2016
2. A-L. Jousselme: "A Fishing Monitoring Use Case in Support to Collaborative Research". NATO RTO Task Group SCI-280 on System-of-systems approach to task driven sensor resource management for maritime situational awareness (SoSMSA) Meeting. La Spezia, Italy, September 1, 2016
3. E. Batty: presentation of the datAcron project at the IALA ENAV- 19 Meeting (standardisation), IALA Headquarter, Paris, 20 September 2016
4. Presentation of datAcron at the Maritime Interest User Group (Ecole Nationale Supérieure de la Marine Marchande, DCNS group), for validating use case requirements and scenarios. Brest, France, 13 October 2016 during the datAcron Project Open Session at the SeaTech event (http://www.seatechevent.eu).
5. E. Camossi: "Maritime Security. Maritime Situational Awareness. Visualization, Formal Knowledge Representation and Evaluation" (including a presentation of the datAcron maritime use case and scenarios). NATO IST 141/RTG 3rd meeting, May 14-19 2017, Valcartier, Quebec, Canada
6. A-L Jousselme: "datAcron maritime use case and scenarios". datAcron Presentation and use case validation at meeting with Maritime Security Experts participating in the NATO Table Top eXercise (TTX) in support to Maritime Situation Awareness (MSA). May 15-18 2017, CMRE, La Spezia, Italy
7. E. Batty. Presentation of the datAcron project at the ENAV IALA meeting, IALA Headquarter, Paris, France, 18-22 September 2017
8. UPRC: " datAcron: Mobility at sea and in the air". presentation and demonstration during Open Session at European Big Data Value Forum, Versailles, France, November, 21-23, 2017
9. E. Batty: "The VHF Data Exchange System – connecting the maritime world", Navigation System Symposium (NAV18), 1-3 May 2018, Goald Coast, Queensland
10. E. Batty: Presentation of the datAcron project at the IALA eNav 22 plenary meeting, IALA HQ, Paris, France, 8th-10th October 2018

Other meetings with Interest User Groups and stakeholders communities

1. CMRE, NARI, FRHF: Maritime user driven evaluation, meeting with stakeholders to refine requirements of GUI. 26-30 March 2018, CMRE, La Spezia, Italy
2. Participation at Euronaval 2018, Paris, France, 22 October 2018, distribution of dissemination material

Presentation and meetings with other European projects

1. UPRC: Collaboration with PROTEUS: Scalable Online Machine Learning for Predictive Analytics and Real-Time Interactive Visualization, March 21 2017
2. CMRE: Telco meeting to discuss potential collaboration with BigDataOcean and DataBio H2020 projects, 1 December 2017

3. G. Vouros: datAcron - Big Data Analytics for Time Critical Mobility Forecasting: Recent Progress and Research Challenges. Maritime Big Data Workshop", CMRE, La Spezia, Italy, 9-11 May 2018. Presentation to H2020 Marisa, Ranger, Big Data Ocean, EUCISE 2020, plus EMODnet . AtlantOS

4. Participation at Euronaval 2018, Paris, France, 22 October 2018, distribution of dissemination material

4.6 Evaluation of dissemination activities and discussion

Figure 23 overviews the dissemination activities organized within task 7.1. Activities are grouped by category, highlighting the corresponding shares over the total of activities. Not surprisingly for a research and innovation project, most of the activities concerned the preparation of scientific publications (32%, including journal and conference papers). Accordingly, scientific presentations at conferences were also numerous (20%).

To testimony the effort devoted to networking with industry and operational community, presentations at specialised scientific events and meetings represent the 18% of the effort. Workshops were 12 (including committed and planned activities following the end of the project), representing the 8% of the activity, followed by technical publications and products (5%) and demonstrations (3%). The media engagement and the social media activities, reinforcing the dissemination strategy, represented the 14% of the effort.
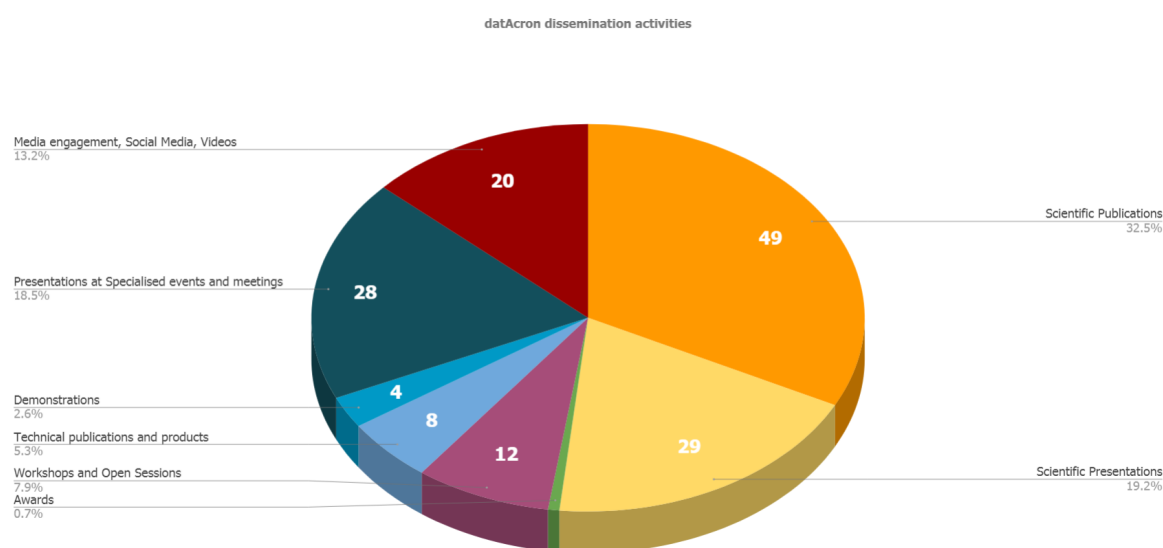

Figure 23 datAcron Dissemination: overview and distribution of activities

In
Figure 24, activities are broken down by category and the achievements are compared with the planned targets, for evaluation. The Figure reports the status of activity (in dark blue), and includes additional activity already submitted and commited (in light blue). Planned activities are also reported (in very light blue). The success rate of each activity with respect to the planned target is reported (%). In almost all cases the success rate is much beyond the planned target (scientific papers in conference proceedings 145%, journal papers submitted 180%, with 13 papers already published, workshops 200%). Only in one case, concerning technical publications and products, the success rate is 89% and the completed and committed activities are 2 less than the planned target. However, in this case, the outcome is complemented by the achievements in activities dedicated to networking with industry and operational communities (technical publications and products 89%, scientific and technical presentations at events and meetings with stakeholders and European projects 625%, demonstrations 133%) and media engagement (500%).
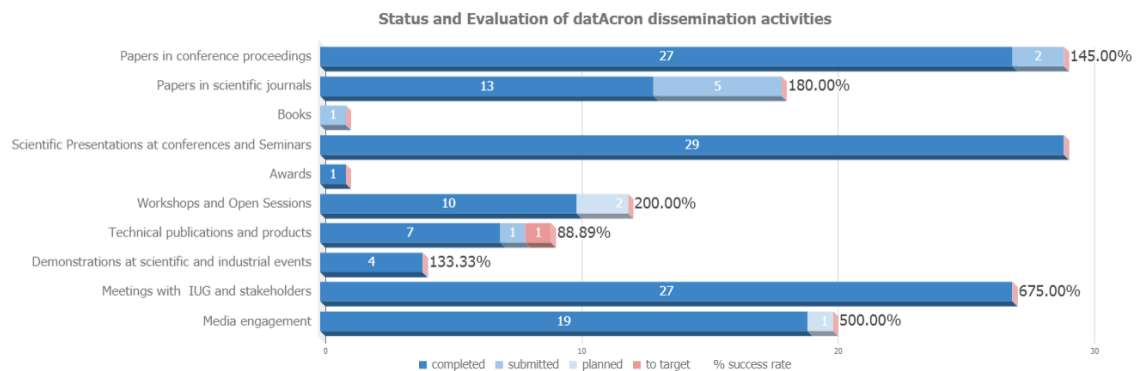
Figure 24 datAcron Dissemination: overview of activities and evaluation

The dissemination has been distributed along the whole duration of the project, and will continue after M36, with activities already committed until 2020 (a workshop and a book) and some planned for 2019.

Figure 25 shows the temporal distribution of the dissemination activities, per month. The dark red area represents the total number of activities, per month. It is visible how the dissemination activities were already numerous since the second half of 2016, with further picks each spring and autumn of 2017 and 2018, around project milestones and main conferences and events.
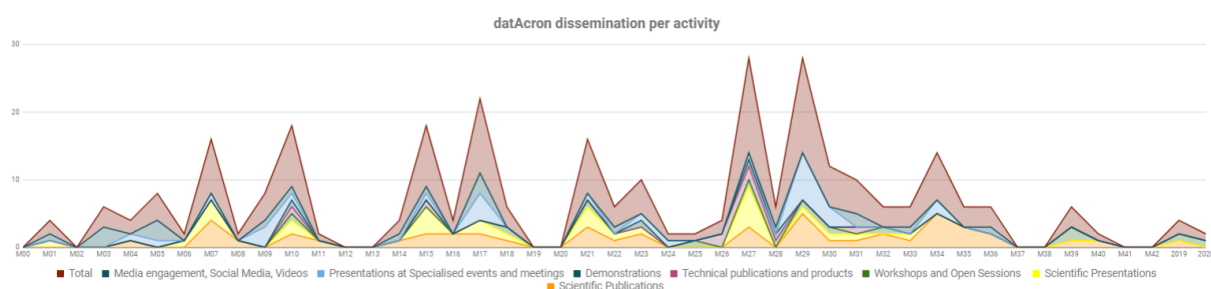

Figure 25 Temporal distribution of datAcron dissemination activities