



**software framework for runtime-Adaptive and secure
deep Learning On Heterogeneous Architectures**

Project Number 780788

Project Acronym ALOHA

D8.3	Second progress and management report		
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Brief description:

The purpose of this deliverable is to provide an overview of the progress and results achieved by the Consortium in the second reporting period of the project, from M10 to M18 (October 2018 – June 2019). This deliverable summarizes major activities per task carried out in each work package.



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¹ The participation of CA TECHNOLOGIES DEVELOPMENT SPAIN SA (CA) has been terminated on May 9th, 2019.

² UNIVERSIDAD POMPEU FABRA (UPF) has been added as new beneficiary on May 29th, 2019.

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1 Executive Summary

The main objective of this deliverable is to provide an overview of the progress made and the results achieved by the Consortium in the second reporting period (from October 2018 to June 2019) of the ALOHA project.

This document extends the information exposed in the previous deliverable *D8.2 – First progress and management report*, in which we summarized the progress made in the first 9 months of the project from month M1 (January 2018) to month M9 (September 2018).

After a description of the general progress of the Action, an explanation of the work carried out per each WP is provided in Section 3.

All partners contributed to this deliverable.

1.1 Acronyms and abbreviations

Acronym	Meaning
CSDF	Cyclo-Static Data Flow
DL	Deep Learning
DNN	Deep Neural Network
DSE	Design-Space Exploration
GA	General Assembly
IPR	Intellectual Property Right
M	Month
SEC	Security evaluation
WP(s)	Work Package(s)

2 General progress of the Action

The ALOHA project aims at developing a software development toolflow for supporting the implementation of Deep Learning (DL) algorithms on heterogeneous low-energy computing platforms. The main objectives of the project are summarized below:

- automate the selection of an optimal algorithm configuration,
- automate the optimization of its partitioning and mapping on a target processing platform,
- automate the optimization of power and energy savings during its deployment,
- assess the proposed approach over three different use-cases, involving surveillance, smart industry and medical application domains,
- validate the approach on two/three reference platforms, showing that it can actually be supported by state-of-the-art technologies.

In order to achieve these objectives, a work plan was defined in Annex 1 of the ALOHA Grant Agreement. It organizes the project in five phases, as shown in Figure 1.

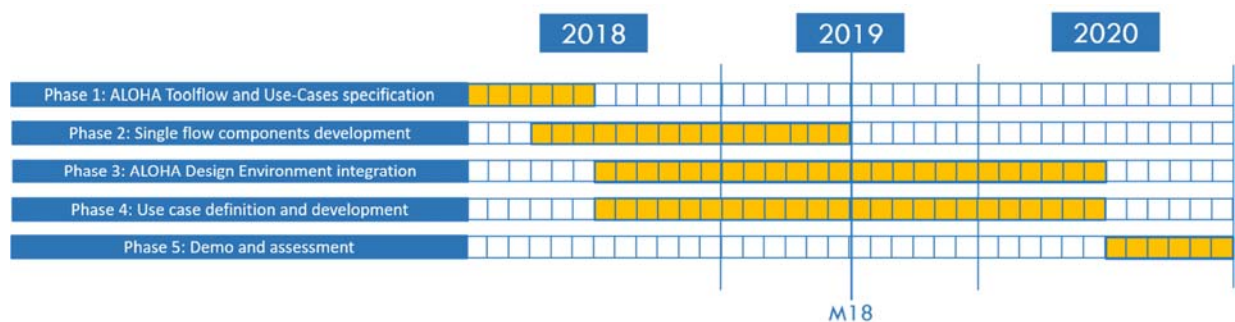


Figure 1: Overview of the ALOHA development macro-phases

- Phase 1 of the project was completed at the end of June 2018 (M6), with WP1 activities focused on specifying the different components of the ALOHA toolflow and the interfaces among them, and on identifying use cases' requirements. At the end of this phase, the first Milestone of the project, *MS1 – Successful kick-off and specification phase*, was reached.
- Phase 2 started at M4 and was completed at the end of June 2019 (M4-M18). It involved activities of WP2, WP3 and WP4, which were responsible for developing the single components of the ALOHA toolflow.
- Phases 3 started at M7 and is currently ongoing (M7-M30). It involves integration activities needed to have the single components developed in WP2, WP3 and WP4 completely ready to be interfaced each other to become a complete system.
- Also Phase 4 started at M7 and is currently ongoing (M7-M30). It mainly deals with the definition and testing of the three use-cases identified in the project.
- Phase 5 is the final phase of the project (M30-M36) and will start at M31. It will be focused on final demonstration activities.

All the activities envisaged for the first 18 months of the project have been accomplished in accordance with the timeline identified in Annex 1 of the ALOHA Grant Agreement. All WPs have started their work. There were no major deviations from the original project planning. All the 16 Deliverables due in the second reporting period (M10 – M18) have been completed and submitted on time through the ECAS portal. The milestones due over this second period were MS2 and MS3 and they have been met on time. We report a list of the submitted Deliverables and Milestones for each WP in the following sections.

3 Explanation of the work carried out per WP

In this section, we provide a summary of the progress made by the Consortium in each WP in the period from month M10 (October 2018) to month M18 (June 2019).

3.1 WP1 – Specification, requirements and integration

WP1 started at M1 and is going to be completed at M30. The activities of WP1 are carried out in three different tasks. Task 1.1 (*System specification and subsystem definition*) and Task 1.2 (*Use-cases specification*) were completed in the first reporting period at month M6. Their activities led, respectively, to the identification of the components of the ALOHA toolflow and the definition of the interaction between them as described in Deliverable D1.1, and to the general specification of the use cases as described in Deliverables D1.4, D1.5 and D1.6.

Task 1.3 (ALOHA toolflow integration) started at M7 and is currently ongoing. As already reported in D8.2 “First progress and management report”, in the first reported period the Consortium agreed on adopting Agile Continuous Integration practice and to use containerized modules to reduce technological dependencies between components. A document with the integration guidelines was prepared by CA and distributed in late M7. Together with the integration guidelines, a code generator was released. This code generator was created with the purpose of facilitating the implementation of required ALOHA components by avoiding developers to set up common ALOHA component features such as containerization, testing, database access, and documentation. The code generator was published in the official repository of the project, which is finally hosted on GitLab and all consortium members were given access to it.

During this reporting period, the activities of Task 1.3 has focused on the actual integration procedure. An integrated project was created on the ALOHA repository, including instructions and scripts needed for the bring-up of a first integrated version of the toolflow, connecting together the available components. This initial version has been co-developed with use-case providers, considering their feedback, adding the needed use-case specific features to the components and creating a preset configuration, directly selectable from the GUI, for each use-case.

In December 2018, the Consortium was informed of the withdrawal from the project of the partner CA and the related third-party CA-UK, leading this task (see section 3.8 for more details). As a countermeasure, the technical work on toolflow integration was temporarily assigned to UNICA (from the period January 2018 – May 2019), and then partially redistributed to UPF, which was added as a new partner in the Consortium and hired the main technical developer involved with CA in the project.

The task is currently running as expected. For more details please refer to deliverable D1.2 “Report on tool flow integration”.

Table 1: WP1 deliverables due in the reporting period

Del No	Title	Lead Benef.	Nature	Dissem. level	Est. Del. Date (Annex I)	Submission date
D1.2	Report on toolflow integration	UNICA	Report	Public	30/06/2019	30/06/2019

3.2 WP2 – Automated algorithm design and configuration

WP2 started at M4 and is going to be completed at M24. The activities of WP2 are carried out in four different tasks. All tasks kicked off at M4. During the first two months of the reported period (from M10 to

M12), the main activities performed were to define the structure of the automated algorithm design and configuration tool (WP2 tool) and its satellite tools, as well as the interfaces between each satellite tool, between the WP2 tool and the datasets/algorithm tools designed in other WPs. The consortium also started the implementation of the WP2 tool and satellite tools. After the Interim project Review that took place in Brussels on December 14th, 2018, the Consortium continued work on the satellite tools with particular focus on their integration with one another.

Task 2.1 (Algorithm configuration tool) is currently ongoing and is going to be completed within M24. During this reporting period, the activities of Task 2.1 were mainly focused on the development of the Design Space Exploration (DSE) engine exploring new DNN topologies to be trained and compared searching for the best solution given application- and architecture-related constraints; and of the Training Engine, used to train the topologies proposed by the DSE engine.

Task 2.2 (Security by design) was completed within this reporting period (M18, June 2019). The main activity performed was the development of the Security Evaluation tool to evaluate sensitivity to adversarial deep learning techniques of a given deep NN topology, in order to compare different topologies and mitigate security risks.

Task 2.3 (Parsimonious inference) was completed within this reporting period (M18, June 2019). The main activity performed was the design of the Refinement for Parsimonious Inference (RPI) tool to lower the numerical representation used by deep NN algorithm (therefore making them potentially more energy efficient and reducing their memory footprint) without giving up their accuracy.

Task 2.4 (Model-based design: architecture and application model) was completed within this reporting period (M18, June 2019). The main activities performed were related to the design of the Performance/Energy Evaluation tool to evaluate performance and energy efficiency of a deep NN topology by means of a dataflow graph model.

For more details please refer to deliverables D2.3 “First release of the automated algorithm configuration tool” and D2.2 “Report on automated algorithm configuration - Update”.

Table 2: WP2 deliverables due in the reporting period

Del No	Title	Lead Benef.	Nature	Dissem. level	Est. Del. Date (Annex I)	Submission date
D2.3	First release of the automated algorithm configuration tool	ETHZ	Demonstrator	Public	31/12/2018	31/12/2018
D2.2	Report on automated algorithm configuration - Update	ETHZ	Report	Public	30/06/2019	30/06/2019

3.3 WP3 – Automated application portioning and mapping

WP3 started at M4 and is going to be completed at M24. The activities of WP3 are carried out in four different tasks. All tasks kicked off at M4 and progressed according to the plans. During the first two months of the reported period (from M10 to M12), the main activities performed were initial proves of concepts of Parsimonious Inference (PI), representation of static and dynamic neural networks, Sesame based and mathematical programming Design Space Exploration (DSE) algorithms. After the Interim project Review that took place in Brussels on December, 14th 2018, the Consortium worked mainly on the standalone

implementation of the corresponding tools and initial integration activities as described in deliverable D3.2.

Task 3.1 (Scenario-based DSE for algorithm mapping) is currently ongoing and is going to be completed within M24. During this reporting period, the activities of Task 3.1 were mainly focused on analysis of use case scenarios and Sesame based DSE.

Task 3.2 (Post-training parsimonious inference) was completed within this reporting period (M18, June 2019). The main activities performed were implementation, testing and integration of the Parsimonious Inference tool in ALOHA tool flow.

Task 3.3 (Mathematical-Programming based DSE and edge computing support) was completed within this reporting period (M18, June 2019). The main activities performed were to build the initial standalone version of mathematical programming-based DSE tool with a proof of concept based on ALOHA reference network (VGG16) on NEURAghe heterogeneous hardware.

Task 3.4 (Model-based system-level DSE: architecture and application model) was completed within this reporting period (M18, June 2019). The main activities performed were ONNX to CSDF converter, generation of Sesame templates, and integration with ALOHA tool flow.

For more details please refer to deliverables D3.3 “First release of the automated tool for application partitioning and mapping” and D3.2 “Report on automated application partitioning and mapping - Update”.

Table 3: WP3 deliverables due in the reporting period

Del No	Title	Lead Benef.	Nature	Dissem. level	Est. Del. Date (Annex I)	Submission date
D3.3	First release of the automated tool for application partitioning and mapping	IBM	Demonstrator	Public	31/12/2018	31/12/2018
D3.2	Report on automated application partitioning and mapping – Update	IBM	Report	Public	30/06/2019	30/06/2019

3.4 WP4 – Hardware abstraction layer generation and runtime management

WP4 started at M4 and is going to be completed at M24. The activities of WP4 are carried out in four different tasks. During the first two months of the reported period (from M10 to M12), the main activities performed were related with the implementation of the set of utilities automating the porting of the algorithm configurations selected and mapped by the upper levels of the design flow on the reference target architecture. After the Interim project Review that took place in Brussels on December, 14th 2018, the Consortium worked on generating code and libraries needed for the eventual implementation directly from ONNX descriptions. To this aim, a specific layer inside ESPAM has been exploited. Similarities between the programming models and available APIs offered by the reference platforms have been taken into account to enable, as much as possible, a common porting methodology. Specialization for the different architectures has been obtained by means of customizable library files, including implementation of CNN actors and communication primitives for the different supported targets, that can selectively be imported based on the use-case. Moreover, a reference methodology for runtime management of the platform, adequately controlling power-related knobs according to the actual workload and operating mode, has been implemented and tested on a single-core low-power processing target.

Task 4.1 (Support for FPGA-based heterogeneous systems) was started at M4 and completed within this reporting period (M18, June 2019). The main activities performed were related to the integration of the NEURAghe programming model in the automated porting process. NEURAghe’s APIs can now automatically be imported inside the code generated by ESPAM and executed when convolution layers are mapped on the NEURAghe’s convolution engine.

Task 4.2 (Support for highly heterogeneous platforms endowed with DL accelerators) was started at M4 and completed within this reporting period (M18, June 2019). The main activities performed were aimed at implementing ALOHA reference application model, based on dataflow process networks, on top of the bare-metal runtime-management primitives exposed by ST-I’s Orlando. CNN algorithms can be ported to the 16 DSP’s inside the prototype chip, CNN actors can be mapped on the different processors and can synchronize with each other to exchange data.

Task 4.3 (Support for off-the-shelf embedded platforms) was started at M4 and completed within this reporting period (M18, June 2019). The main activities performed were dedicated to the creation of a utility directly automating the generation, from an algorithm configuration specified as an ONNX description, of libraries downloadable on a Snapdragon processor.

Task 4.4 (Runtime platform management) was started at month M13 and is currently ongoing. It is going to be completed within M24. During this reporting period, the activities of Task 4.4 were mainly focused on the implementation of techniques for the adaptive management of the target hardware platforms during the inference. A procedure enabling activation/deactivation/migration of process tasks has been implemented and tested on the SensorTile platform, and preliminarily assessed on a CNN-based benchmark characterized by highly varying workload and multiple functional conditions. The procedure has proven to be capable of saving energy by adapting frequency and power supply conditions to the detected workload.

For more details please refer to deliverables D4.3 “First release of the hardware abstraction layer utilities” and D4.2 “Report on hardware abstraction layer techniques - Update”.

Table 4: WP4 deliverables due in the reporting period

Del No	Title	Lead Benef.	Nature	Dissem. level	Est. Del. Date (Annex I)	Submission date
D4.3	First release of the hardware abstraction layer utilities	ST-I	Demonstrator	Public	31/12/2018	31/12/2018
D4.2	Report on hardware abstraction layer techniques – Update	ST-I	Report	Public	30/06/2019	30/06/2019

3.5 WP5 – Toolflow assessment

WP5 started at M7 and is going to be completed at M36. The activities of WP5 are carried out in four different tasks. All tasks are progressing according to the plans. Table 5 shows the deliverables of WP5 completed in the reported period.

Task 5.1 (Industry automation) was started at month 7 and is currently ongoing. It is dedicated to the implementation of the Smart Industry use-case. During this reporting period, the activities of Task 5.1 were mainly focused on the definition of a baseline keyword spotting project, including a first complete set of inputs to the Toolflow and on the initial Toolflow assessment. This involved, especially from M10 to M15, the dataset preparation, the definition of initial constraints, the reference CNN algorithm, the identification

of the target embedded hardware platform and the use case implementation as reported in D5.2 and D5.4. We also set-up an initial deployment on a SensorTile board. Later on, REPLY actively supported the Toolflow development by testing the functionalities over the specific use case and continuously providing feedback to the developers about issues found and foreseen improvements, and contributed to releasing the first use case demonstrator as described in the deliverable D5.6.

Task 5.2 (Surveillance) was started at month 7 and is currently ongoing. It is dedicated to the implementation of the Surveillance use-case. During the first months of this period, the activities of Task 5.2 were focused on system design, data preparation, including the development of necessary tools as well as a framework for generating synthetic data, and algorithm analysis. During this period PKE has also performed an analysis of various possible hardware platforms to be used as its main target platform. Later on, especially after M12 when the first version of the Toolflow was taking shape, PKE has increased the assessment activities by actively participating of the development of the Toolflow, especially by testing and giving to the developers PKE's feedback about found problems and improvements suggestions. This approach was described in the deliverable D5.2 and includes an ALOHA use case workshop hosted in Vienna. In the reported period, we have concluded the First release of the use case implementation as described in D5.2 and D5.4 and the first use case demonstrator as described in the deliverable D5.6.

Task 5.3 (Medical) was started at month 7 and is currently ongoing. It is dedicated to the implementation of the Medical use-case. During this reporting period, the activities of Task 5.3 were mainly focused on designing and developing the toolflow to cope with our needs. Specifically, handling of relatively large datasets, high memory requirements, heavy training processes and input versatility that are necessary for our use. Thus, during the first few months we defined the workflows we would like to be supported by the ToolFlow and the derived inputs. These discussions were done with a collaboration with SCCH. Next, we coded a tool that will be used during our computational flow to adapt our data format to the expected medical-case Toolflow-format we defined. Additionally, we converted our CNN-model to ONNX format. Later on, especially after M13, after some stabilization of the Toolflow, we installed the ToolFlow on our GPU machines. The installation required some necessary installations and upgrades until the docker was able to make a basic run, and issues relevant to our use case were raised and discussed. The successful installation of the ToolFlow was considerably facilitated by PKE's organized workshop for case-providers in Vienna in M16.

To reassure the compatibility of our data with the Toolflow and for debugging and research purposes we uploaded into the GitLab some MaxQ.AI proprietary data in the expected input format.

Task 5.4 (General assessment) will start at month M31 and will be mainly focused on the overall assessment of the ALOHA toolflow in its final state.

For more details please refer to deliverables D5.2 "Report on Use Case Implementation – First update", D5.4 "First release of use-case implementation", and D5.6 "Use-case demonstrators".

Table 5: WP5 deliverables due in the reporting period

Del No	Title	Lead Benef.	Nature	Dissem. level	Est. Del. Date (Annex I)	Submission date
D5.2	Report on use-case implementation – First update	PKE	Report	Confidential	31/03/2019	31/03/2019

D5.4	First release of use-case implementation	PKE	Demonstrator	Confidential	31/03/2019	31/03/2019
D5.6	Use-case demonstrators	PKE	Demonstrator	Confidential	30/06/2019	30/06/2019

3.6 WP6 – Exploitation

WP6 started at M1 and is going to be completed at M36. The activities of WP6 are carried out in two different tasks, **Tasks 6.1 (Open-source exploitation)** and **Task 6.2 (Industrial exploitation)**. Both tasks started at M1 and will be active throughout the whole lifetime of the project. As already reported in deliverable D8.2 “First progress and management report”, WP6 is a horizontal work package, as the continuous work performed in this work package will influence the technical WPs to make sure that the outcomes are aligned with the market needs. Similarly, the technology developed in the rest of WPs will also affect the exploitation work, since it will help refine the exploitable outcomes and increase the obtained impact.

During this reporting period, the activities of Tasks 6.1 and 6.2 were mainly focused on refining the first exploitation plan submitted at month M4 (D6.1), to ensure that all the tools and modules developed during the project match with problems and needs that SMEs and mid-caps experienced. All partners, but in particular industrial partners, held B2B meetings with their partners and stakeholders, collecting feedback and suggestions for improvements. The reinforcement of the ALOHA users community has been considered a priority, so during this period a series of seminars, workshops, tutorials were organized by different partners to present and discuss the approach to DL at the edge defined within the ALOHA project, trying to engage as users as possible.

For more details please refer to deliverables D6.2 “Exploitation plan – First update”, and D6.4 “Report on the exploitation activities”.

Table 6: WP6 deliverables due in the reporting period

Del No	Title	Lead Benef.	Nature	Dissem. level	Est. Del. Date (Annex I)	Submission date
D6.2	Exploitation plan – First update	ST-I	Report	Public	30/06/2019	30/06/2019
D6.4	Report on the exploitation activities	IBM	Report	Public	30/06/2019	30/06/2019

3.7 WP7 – Dissemination

WP7 started at M1 and is going to be completed at M36. The main objective of WP7 is to establish a project dissemination and communication plan to ensure widespread use of the toolflow and maximize the project impact. Besides the definition of the plan, all the activities that contribute to put in place the foreseen plan refer to this WP.

The activities of WP7 are carried out in three different tasks.

Task 7.1 (Communication strategy and planning) started at M1 and is currently ongoing. During this

reporting period, the activities of Task 7.1 were mainly focused on activating proper communication channels. Two social media channels have been activated and are used by the consortium partners. The ALOHA website, active since the beginning of the project, is constantly updated.

Task 7.2 (Dissemination, Training and Education) started at M1 and is currently ongoing. During this reporting period, the activities of Task 7.2 lead the ALOHA consortium to a) publish and present different works in several international journals and conferences; and b) organize and present ALOHA activities during workshops and tutorials.

Task 7.3 (Users community) started at M7 and is currently ongoing. During this reporting period, we managed to involve 26 members in our community and we plan actions to increase the involvement.

All the numerical details related to achievements and actions already performed are reported in D7.5 “Dissemination and Communication report”, while an update of the strategies to disseminate ALOHA results are included in D7.3 “Plan for the dissemination and communication – First update”.

Table 7: WP7 deliverables due in the reporting period

Del No	Title	Lead Benef.	Nature	Dissem. level	Est. Del. Date (Annex I)	Submission date
D7.3	Plan for the dissemination and communication – First update	P-ONE	Report	Public	30/06/2019	30/06/2019
D7.5	Dissemination and Communication report	UNISS	Report	Public	30/06/2019	30/06/2019

3.8 WP8 – Management

WP8 deals with all the management activities required to keep the project on track, to synchronize the activities performed by different partners in different WPs, to solve any administrative and financial issue, and to ensure the achievement of the planned outcomes on time and with the highest quality possible. WP8 is organized around five tasks, that started at M1 and will run in parallel up to the end of the project. The summary of progress towards WP8 tasks in the reported period is described below.

Task 8.1 (Kick-off and Periodic meetings) - In the period considered by this report (October 2018 – June 2019), the Consortium has met twice face-to-face and numerous times by conference call and e-mail.

Consortium meetings

The Consortium has met twice face-to-face, in December 2018 in Bruxelles (Belgium) and in February 2019 in Linz (Austria). Both times, all beneficiaries were represented.

- *Rehearsal meeting* – organized and hosted by UNICA on 13th of December 2018 in the Meeting room of the Ibis Brussels City Centre Hotel, rue Joseph Plateau N°2 1000, Brussels. All 14 consortium partners were represented, with a total of 22 attendees. The meeting was an opportunity for all consortium members to meet and finalize the presentations a day before the interim review meeting.
- *Second regular meeting* - organized and hosted by SCCH from 5th to 6th of February 2019 in Linz, Austria. All 14 consortium partners were represented, with a total of 24 attendees. This technical plenary meeting offered the opportunity for the Consortium to discuss the recommendations and comments received from the 1st interim review, to synchronize activities across different WPs, refine

specification of the ALOHA toolflow components and of the use cases, and discuss the next actions and responsibilities for the coming months (February 2019 to September 2019).

- *Third GA meeting* - held jointly with the second regular meeting in Linz on 5th of February 2019.

The next plenary meeting will be held in Haifa, hosted by IBM, at the end of October 2019 or at the beginning of November 2019.

Technical face-to-face meetings

Several technical meetings with relevant partners have been organized to successfully carry out the activities of workpackages WP1, WP2, WP3, WP4 and WP5.

- *Integration technical meeting* - organized and hosted by CA in Barcelona on 5th of October 2018. The ALOHA partners CA, UvA, SSCH, ETHZ, UL, UNICA and IBM had the opportunity to analyze and resolve various issues related to the integration (WP1), in particular to the code generator usage and testing.
- *Integration technical meeting* - organized and hosted by UNICA in Cagliari from April 15th to April 17th 2019. The ALOHA partners UvA, UL and UNICA had the opportunity to analyze and resolve various issues related to the integration of the DSE engine and the Performance/Power evaluation tool (WP1, WP2).
- *Integration technical meeting* - organized and hosted by UNICA in Cagliari from May 6th to May 10th 2019. The ALOHA partners SSCH and UNICA had the opportunity to analyze and resolve remaining issues related to the Data parsing and Training engine interfacing with the rest of the toolflow (WP1, WP2).
- *Integration technical meeting with use-case providers* - organized and hosted by PKE in Vienna (Austria) from May 22nd to May 23rd 2019. The technical partners SSCH and UNICA, involved in developing parts of the toolflow that interface with Use-Case implementations, had the opportunity to meet REPLY, PKE and MaxQ-AI to analyze and resolve various issues related to the implementation of the use-cases (WP1, WP5). During the meeting, a first version of the GUI was tested and a first set of feedback was collected about the usability.
- *Implementation meeting* - organized UNISS and hosted by UNICA in Cagliari from June 3rd to June 04th 2019. The ALOHA partners UNISS and UNICA met to discuss power related matters of a voice controller implementation on Sensor Tile (WP4).
- *Integration technical meeting* - organized and hosted by UNICA in Cagliari from June 11th to June 12th 2019. The ALOHA partners ETHZ and UNICA had the opportunity to analyze and resolve various issues related to the integration of the algorithm configuration refinement tool (WP1, WP2).
- *WP4 technical meeting* - organized and hosted by UNICA in Cagliari from June 24th to June 25th 2019. The ALOHA partners ST-I, UNISS and UNICA met to plan activities around the Orlando platform usage.

Technical online meetings

In order to track progress of the project, support the cooperation among partners, and synchronize activities with the project schedule, various online meetings have been organized within the reporting period, as shown in Table 8.

Table 8: List of teleconference meetings

WP	Topic	Attendees	Date(s)
WP1, WP2, WP3, WP4, WP5, WP8	Status of the project and running activities on toolflow development and integration. Discussion on next deliverables due at M12. Agreement on interview questions for the Advisory Board. Possible agenda for the 1 st interim review meeting in Bruxelles. Next plenary F2F meeting	All	08/11/2018 15/11/2018 22/11/2018

	scheduling.		
WP8	Discussion of possible re-allocation of the CA's activities inside or outside the Consortium in case of CA withdraw.	ST-I, UNICA, CA	28/11/2018 03/12/2018
WP1, WP2, WP3, WP4	Status of the demonstrators due at M12. Discussion about the GUI. Deadlines for review presentations upload on BOX.	All	29/11/2018 06/12/2018
WP5, WP8	Status of the Amendment request. Use-cases implementation, definition of the table of content for D5.2. Dataset specification and baseline constraints for each use-case. Clarification about peak performance numbers. Implementation of "Fast accuracy evaluation" option in the Training engine under development.	UNICA, SCCH, ETHZ, PKE, REPLY, MaxQ, UNISS, IBM, UL, UvA, IRIDA, ST-I	14/02/2019 28/02/2019 07/03/2019
WP1, WP2, WP3, WP4, WP5	Status of deliverables D5.2 and D5.4. Set-up of a first set of integration experiments. Scheduling of face-to-face integration meetings to accelerate integration activities.	UNICA, SCCH, ETHZ, PKE, REPLY, MaxQ, UNISS, IBM, UL, UvA, IRIDA, ST-I, MaxQ-AI	21/03/2019
WP1	First face-to-face integration meetings planned. Discussion of some integration issues experienced by partners. Updates about the user interface design. Discussion on next deliverables, due at M18.	UNICA, SCCH, ETHZ, PKE, REPLY, MaxQ, UNISS, IBM, UL, UvA, IRIDA, ST-I	04/04/2019
WP1, WP5, WP8	Reporting on the face-to-face integration meeting held in Cagliari among UNICA, UvA and UL. Definition of a demo for each use-case. Next ALOHA f2f meeting.	UNICA, SCCH, IL, IBM, P-ONE, PKE, REPLY, ST-I, MaxQ-AI	18/04/2019
WP1, WP5, WP8	Reporting on the face-to-face integration meeting held in Cagliari between UNICA and SCCH. Discussion on the first version of the toolflow available for use-cases testing.	UNICA, UvA, UL, IL, P-ONE, PKE, REPLY, ETHZ, ST-I	16/05/2019
WP1, WP8	Discussion on amendments accepted. Reporting on the face-to-face integration meeting held in Vienna among technical developers and use-case providers. Execution of Training Engine satellite tool on use-case algorithms. Status of deliverables due at M18. Confirmation of venue and time for the next ALOHA f2f meeting.	UNICA, IL, IBM, P-ONE, REPLY, ST-I, MaxQ-AI, UPF, ETHZ	30/05/2019
All	Status of deliverables due at M18. Reporting of the next exploitation and dissemination activities.	UNICA, UvA, UL, SCCH, UNISS, IL, IBM, P-ONE, REPLY, ST-I, MaxQ-AI, UPF, ETHZ	06/06/2019 20/06/2019

Technical meeting minutes were made available for consortium members on Box.

Task 8.2 (Monitoring and Periodic Report Management)

Critical implementation risks identified in Annex 1 of the ALOHA Grant Agreement have not affected the activities carried out in the period considered by this report. Therefore, no mitigation actions were required. At month M13 (11th January 2019), the Project Coordinator on behalf of the Consortium submitted an amendment request using the Participant Portal (reference number AMD-780788-9). The request of amendment concerned the following items:

- *Removal of a beneficiary whose participation was terminated* – Partner CA TECHNOLOGIES DEVELOPMENT SPAIN SA (CA) and the related third-party CA TECHNOLOGY R&D LIMITED (CA-UK) have been acquired by Broadcom Inc., a leading semiconductor company. Unfortunately, this acquisition has resulted in the practical termination of CA research teams working on EU funded projects. As consequence, in November 2018 CA notified the Consortium about their withdrawal from the ALOHA project as a Beneficiary. The participation of CA was terminated on May 9th, 2019.
- *Addition of a new beneficiary* – Partner Universidad Pompeu Fabra (UPF), established in PLACA DE LA MERCE, 10-12, BARCELONA 08002, Spain, VAT number: ESQ5850017D, was added as new beneficiary on May 29th, 2019. UPF hired the main technical developer involved with CA in the ALOHA project.
- *Removal of a linked third party* – The participation of the third-party CA TECHNOLOGY R&D LIMITED (CA-UK), affiliated or linked to CA TECHNOLOGIES DEVELOPMENT SPAIN SA, was terminated on May 9th, 2019.
- *Change of Annex 1 (description of the action)*: the role of integrator of the tool flow originally assigned to CA has been transferred to UPF and UNICA. The role of exploitation leader of the consortium has been transferred to ST-I and IBM. The goals of the exploitation strategy remain almost unchanged, with a more specific focus on the exploitation of the industrial partners that will use the ALOHA results in relation with their own products. The Innovation manager role has been assigned to ST-I instead of CA.
- *Changes of Annex 2 (estimated budget)*: the modifications of the effort on the work packages due to the replacement of CA duties by other partners is represented in the following table, where the modification of the man month associated to a partner for each WP is reported.

Table 9: Amendment of effort per WP

WP	ST-I	UNICA	SCCH	IBM	UPF	CA
WP1: Specification, requirements and Integration		+12.00			+14.00	-26.48
WP2: Automated algorithm design and configuration					+17.00	-17.81
WP5: Tool flow assessment			+5.00		+4.00	-6.00
WP6: Exploitation	+10.00	+4.00		+9.00	+1.00	-18.58
WP7: Dissemination		+8.00			+1.00	-9.27
WP8: management			+2.00		+1.00	-2.36
Global Variation	+10.00	+24.00	+7.00	+9.00	+38.00	-80.50

The remaining effort left by CA has been distributed among:

- ST-I and IBM for the activities related to the exploitation and the management of WP6;
- UNICA for the support for the integration, exploitation and dissemination;
- SCCH for the assessment of the tool flow and a support for the management of the project;
- The remaining effort has been assigned to the new partners UPF in order to replace the activities of CA for the development, integration and assessment of the tool flow.

The global variation of the budget is presented in the following table:

Table 10: Budget updated after the amendment

Partner	Original direct personnel cost	Original Other direct costs	Original grant amount	New direct personnel cost	New other direct costs	New Grant Amount
ST-I	609,760.00 €	35,000.00 €	805,950.00 €	668 960.00 €	35,000.00 €	879 950.00 €
UNICA	364,500.00 €	31,000.00 €	494,375.00 €	472 500.00 €	33 089.83 €	631 987.29 €
SCCH	232,000.00 €	18,400.00 €	313,000.00 €	270 666.67 €	18 400.00 €	361 333.33 €
IBM	543,780.00 €	41,300.00 €	731,350.00 €	629 640.00 €	41 300.00 €	838 675.00 €
UPF	-	-	-	170 050.00 €	27 000.00 €	246 312.50 €

The modifications on the budget reflect the changes in the effort allocation for the partners involved.

The values presented here are valid since the amendment entered into force on May 29th, 2019. The termination of CA is effective since the 9th of May 2019, when the amendment has been submitted.

The final finance declaration of CA for the completion of the procedure is not complete yet, at the time this document is released. A draft description of their declaration is presented here:

Table 11: CA finance declaration after the withdrawal

	Direct personnel costs	Other direct costs	Indirect costs	Requested contribution
CA Technologies	78,846.02 €	4,143.36 €	20,747.35 €	103,736.73 €
Third party – CA UK	84,025.14 €	0.00 €	1,294.78 €	6,473.90 €
TOTAL	84,025.14 €	4,143.36 €	22,042.13 €	110,210.63 €

The effort declared by the partner CA and its associated third party is presented in the following table.

Table 12: CA effort distribution

WP	CA planned	CA-UK planned	CA declared	CA-UK declared
WP1: Specification, requirements and Integration	31.75	0.25	5.25	0.27
WP2: Automated algorithm design and configuration	24.00		6.19	0.00
WP5: Tool flow assessment	6.00		0.00	0.00
WP6: Exploitation	18.50	2.50	2.30	0.00
WP7: Dissemination	10.00		0.67	0.06
WP8: management	2.75	0.25	0.64	0.12
Global Variation	93.00	3.00	15.05	0.45

At the time this document is written, the termination procedure for CA is at the following status:

- The technical report is ready to be submitted
- The finance declaration has been uploaded but not yet submitted to the coordinator

Task 8.3 (IPR Management) - At month M1, the Consortium has identified an IPR Manager in the person of Michael Masin (IBM), who is responsible for assisting in the identification, capture and protection of intellectual property arising from research activities within ALOHA. A *Consortium Agreement* was discussed and elaborated during the first months of the project and signed by all partners at month M5. It provides guidelines for the management of all internal IPR-related issues related to the future use and dissemination of the foreground by all the project partners. The Consortium has defined the open research data strategy to be implemented with the qualitative and quantitative data produced and/or used in ALOHA. The first

D8.3 Second progress and management report

version of the *Open Data Management Plan* has been updated at M18 (see Deliverable D8.7). It includes a description of which data will be kept confidential and which will be made openly available to Third Parties for verification and re-use and, how these data will be curated and preserved for future researchers.

Task 8.4 (Innovation Management) - At month M1, the Consortium has identified an Innovation Manager in the person of Oscar Ripolles (CA), who is responsible for fostering and coordinating innovation through the development and implementation of the project. After the termination of CA, this role has been assigned to ST-I.

In this role ST-I, with the collaboration of the technical leader UNICA, has verified that the activities conducted in ALOHA are still beyond the state of the art and that can contribute to the improvement of the technology and the support for the users to the deployment of new applications and their optimization on the different platforms needed. In this role ST-I followed the progress of the exploitation activities while refining the plan for the next stage of the project and the future at the end of it.

The first version of the *Exploitation plan* submitted at M4, has been updated at M18 (see Deliverable D6.2). A report on the exploitation activities carried out within the first 18 months has been prepared (see Deliverable D6.4).

Task 8.5 (Quality Assurance Management) - At month M1, the Consortium has identified a Quality Assurance Manager in the person of Daniela Loi (UNICA), who is responsible for ensuring a smooth quality monitoring over the whole project activities. A *Project Quality Handbook* was prepared and distributed among partners at M3 (see Deliverable D8.5). It provides guidelines and instructions to ALOHA partners on how to manage and assure quality and how to implement risk management throughout the lifecycle of the project. The report summarizes all relevant information about the project management structure, the distribution of roles and responsibilities among partners, the communication strategy to be adopted within and outside the Consortium as well as the procedures and templates to be followed when preparing project documents and periodic reports.

Table 13: WP8 deliverables due in the reporting period

Del No	Title	Lead Benef.	Nature	Dissem. level	Est. Del. Date (Annex I)	Submission date
D8.3	Second progress and management report	ST-I	Report	Public	30/06/2019	30/06/2019
D8.7	Open Data Management Plan – First update	UNICA	ORDP: Open Research Data Pilot	Public	30/06/2019	30/06/2019

3.9 WP9 – Ethics requirements

WP9 sets out the 'ethics requirements' that the project ALOHA must comply with. This work package contains the additional obligations in the form of two 'ethics deliverables', which have been completed and submitted through the ECAS portal at M3.

4 Milestones achieved

Table 10 summarizes the milestones achieved by the Consortium in the reported period.

Table 14: Milestones achieved in the reported period

No	Name	Lead Beneficiary	Delivery Date (Annex I)	Delivery Date (actual)
MS2	Successful UC related preliminary study and development phase	PKE	31/12/2018	31/12/2018
MS3	Successful development of tools and use-cases	PKE	30/06/2019	30/06/2019