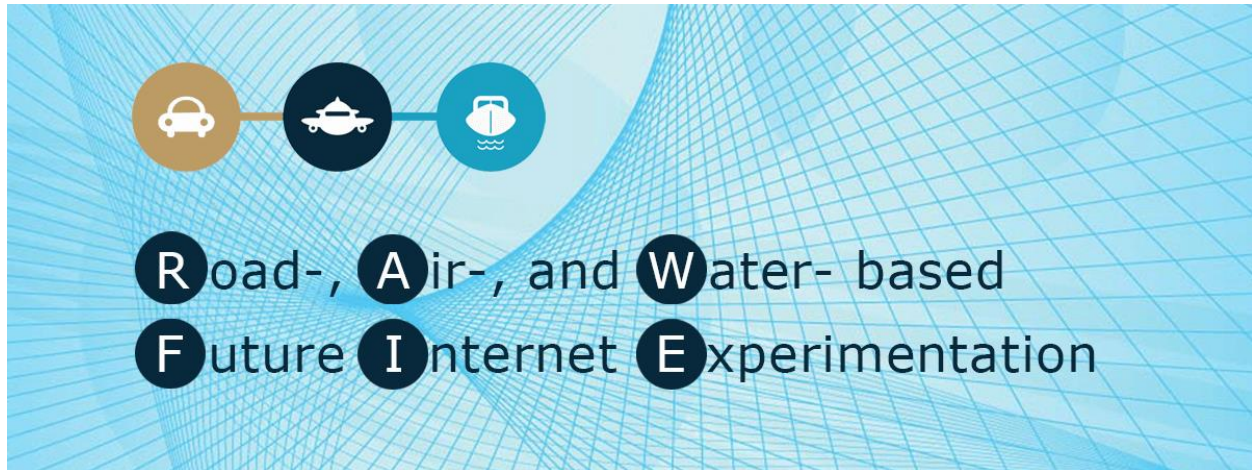# RAWFIE Open Call 2 – Guidelines

Announcement of the 2nd RAWFIE Open Call for recipients of financial support

Project acronym: RAWFIE
Project grant agreement number: 645220
Project full name: Road-, Air-, Water-based Future Internet Experimentation

Project RAWFIE (www.rawfie.eu), co-funded from the European Union's Horizon 2020 research and innovation programme under grant agreement No 645220, foresees as an eligible activity the provision of financial support to third parties, as a means to achieve its own objectives.

The types of activities that qualify for receiving financial support are the following:
- Extensions (hardware)
  - UGV Extension: Addition & customization of Unmanned Ground Vehicles (RAWFIE-OC2-EXT-UGV) – no feasibility check is needed
  - UAV Extension: Addition & customization of Unmanned Aerial Vehicles (RAWFIE-OC2-EXT-UAV) – no feasibility check is needed
- Experimentation (software)
  - Scientific Excellence (RAWFIE-OC2-EXP-SCI) – **feasibility check is needed**
  - Innovation by SMEs (RAWFIE-OC2-EXP-SME) – **feasibility check is needed**

Feasibility check deadline (only for Experimentation activities RAWFIE-OC2-EXP-SCI, RAWFIE-OC2-EXP-SME): 19 February, at 17:00 CET (Brussels local time)
Final submission deadline (for all four types of activities): 19 March 2017, at 17:00 CET (Brussels local time)

Expected duration of participation: 18 months for RAWFIE-OC2-EXT (starting from July, 2017 to December, 2018) and 12 months for RAWFIE-OC2-EXP (starting from October, 2017 to September, 2018)

Maximum amount of financial support for each proposal: € 150 000 for RAWFIE-OC2-EXT-UGV and RAWFIE-OC2-EXT-UAV, € 100 000 for RAWFIE-OC2-EXP-SCI, € 75 000 for RAWFIE-OC2-EXP-SME

Call identifier: RAWFIE-OC2 call

Language in which proposal should be submitted: English

Web link for further information (full call text/proposal guidelines/call results):
http://www.rawfie.eu/content/open-call-no-2

Email address for further information: rawfie-contact@cnl.di.uoa.gr

[Please use the respective call identifier in the subject of your email (RAWFIE-OC2-EXT-UGV, RAWFIE-OC2-EXT-UAV, RAWFIE-OC2-EXP-SCI, RAWFIE-OC2-EXP-SME)]

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Eligibility of proposers and evaluation conditions:
- Proposals will only be accepted from a single party eligible for participation in the EC H2020-projects.
- Evaluation and ranking will be carried out by an external jury of individual experts.
- Multiple proposals may be submitted by the same party. In case that multiple proposals coming from the same party pass the funding limits, RAWFIE Consortium has the right to decide which one of them will be accepted for funding.
- Successful applicants of the 1st RAWFIE Open Call are not eligible to participate.

Other conditions:
- Proposals must follow the provided **template**.
- Proposals must be submitted through the **EasyChair** system.
- Once a proposal is positively evaluated for funding, the respective proposer will be contracted by the project coordinator (UoA) as Third Party.

Call Objectives

RAWFIE (Road-, Air- and Water- based Future Internet Experimentation) is a project funded by the European Commission (Horizon H2020 programme) under the FIRE initiative aiming to provide research and experimentation facilities through the growing domain of unmanned networked devices. The **FIRE initiative** (**F**uture **I**nternet **R**esearch and **E**xperimentation) creates an **open research environment** which facilitates strategic research and development of new Future Internet concepts, giving researchers the tools they need **to conduct large-scale experiments** on new paradigms.

The purpose of the RAWFIE project is to create a federation of different testbeds that will work together to make their resources available under a common framework. Specifically, it aims at delivering a unique, mixed experimentation environment across the space and technology dimensions. RAWFIE integrates numerous testbeds for experimenting in vehicular (road), aerial and maritime environments. Vehicular Testbeds (VT) will deal with Unmanned Ground Vehicles (UGVs) while Aerial Testbeds (AT) and Maritime Testbeds (MT) will deal with Unmanned Aerial Vehicles (UAVs) and Unmanned Surface

Vehicles (USVs), respectively. The RAWFIE Consortium includes all the possible actors of this highly challenging experimentation domain, from technology creators to integrators and facility owners. The basic idea behind the RAWFIE effort is the automated, remote operation of a large number of robotic devices (UGVs, UAVs, USVs) for the purpose of assessing the performance of different technologies in the networking, sensing and mobile/autonomic application domains. RAWFIE features a significant number of UxV nodes for exposing the experimenter to an extensive test infrastructure. All these items are managed by a central controlling entity, which will be programmed per case and fully overview/drive the operation of the respective mechanisms (e.g., auto-pilots, remote controlled ground vehicles). Internet connectivity will be extended to the mobile units to enable the remote programming (over-the-air), control and data collection. Supportive software for experiment management, data collection and post-analysis will be virtualized to enable experimentation from anywhere in the world. The vision of Experimentation-as-a-Service (EaaS) is promoted through RAWFIE. The IoT paradigm is fully adopted and further refined for supporting highly dynamic node architectures.

The objective of the *2nd RAWFIE Open Call* is twofold: first, to enhance certain parts and characteristics of the federated infrastructure in terms of UxV devices (RAWFIE-OC2-EXT-UGV, RAWFIE-OC2-EXT-UAV); second, to support cross-domain or domain-specific real-world applications and experiments (RAWFIE-OC2-EXP-SCI, RAWFIE-OC2-EXP-SME). Each proposal should target at **exactly one** of the four types of activities (we call them *directions of enhancement*) as stated in the next paragraphs. In case a proposer intends to cover more than one of the four activities listed below, this should be addressed by the submission of separate proposals. All the proposals should fully comply with the public Deliverables (can be found [here](#)) that have been produced so far by the RAWFIE Consortium and provide system requirements as well as technical description and implementation details for the RAWFIE architecture and specific components.

The submission phase of the experimentation proposals will take place in two stages. In the first stage, the proposing party has to submit a draft, but fully completed, proposal describing the experiment by February 19, 2017 using the online submission system. In this stage, all parts of the proposal should be completed and the RAWFIE consortium will check the feasibility of the proposed experiment (i.e., if the experiment can be supported sufficiently by the existing infrastructure, proposed devices and testbeds or further extensions are needed). RAWFIE consortium will provide feedback on the feasibility check to the proposer before March 6, 2017. The feedback of the feasibility check has to be included in the respective part of the proposal template by the proposer during the final submission step. The proposer should perform only minor revisions on the proposal during the final submission stage (i.e., the core parts of the experiment should remain unchanged). During the feasibility check, no evaluation of the experiment will be performed. The independent experts that will perform the actual evaluation of the proposals will be advised to reject proposals with significant differences between the two stages.

No feasibility check is required for proposals targeting at UGV and UAV extensions. These proposals will be submitted in one step (final submission deadline).

Identifier	Category	Call Budget	Max budget per proposal	Expected type of applicant	Expected proposal

HARDWARE & CUSTOMISATION	RAWFIE-OC2-EXT-UGV	Unmanned Ground Vehicles	€ 450.000	€ 150.000	UGV manufacturer, hardware assembly company or provider	Provision of a number of UGV devices + customization software
	RAWFIE-OC2-EXT-UAV	Unmanned Aerial Vehicles	€ 300.000	€ 150.000	UAV manufacturer, hardware assembly company or provider	Provision of a number of UAV devices + customization software
EXPERIMENTATION	RAWFIE-OC2-EXP-SCI	Scientific Excellence	€ 700.000	€ 100.000	Academia, research institute, industry (not SME), public body	Extensive cross-domain / horizontal or domain-specific experiments and supportive software
	RAWFIE-OC2-EXP-SCI-SME	Innovation by SMEs	€ 500.000	€ 75.000	Small and Medium Enterprises	Extensive cross-domain / horizontal or domain-specific experiments and supportive software
		Total funding	€ 1.950.000			

- **Activity / Direction of enhancement 1: Addition & customization of Unmanned Ground Vehicles.**

The basic idea behind the RAWFIE effort is the automated, remote operation of a large number of robotic devices for the purpose of assessing the performance of different technologies in the

networking, sensing and mobile/autonomic application domains. RAWFIE considers three kinds of vehicles; UGVs, USVs and UAVs. The project aims to feature a significant number of UxV nodes in order to establish an extended test infrastructure for RAWFIE related experimentation purposes. All these items will be managed by a central controlling entity which will be programmed per case and fully overview/drive the operation of the respective mechanisms (e.g., auto-pilots, remote controlled ground vehicles). Internet connectivity will be extended to the mobile units to enable remote programming (over-the-air), control and data collection.

*In the context of the 2ⁿ RAWFIE Open Call, the project invites **manufacturers and providers of Unmanned Ground Vehicles** to participate and expand the existing RAWFIE equipment. The project expects proposals that will provide and customize a considerable number of devices (>10) that belong to the UGV type of robotic devices. The exact number of devices considered by each proposal should comply with the requested funding and will be part of the evaluation process. Proposals considering higher number of devices will be considered favorably.*

The proposers should present clearly within the proposal text a number of features and characteristics of the unmanned vehicles that will be possibly considered as future additions to the project. These features include, but are not limited to, the following aspects of the vehicles:

- Processing capabilities (type of processors, number of cores, speed);
- Size and dimensions;
- Weight;
- Payload;
- Battery;
- Number and type or sensors;
- Number and type of integrated network components and supported communication interfaces;
- Minimum and maximum autonomy of the device;
- Auto-return capability (return to the base station automatically);
- Ability of the vehicle to operate as an access point;
- (Remote) Control interface;
- Over-the-air programming capabilities;
- Provision of collision avoidance mechanism;
- Compatibility with Apache Kafka architecture;
- Data storage of the vehicle;
- Support of "safe mode" operation;
- Localization capabilities (e.g., GNSS);
- Ability to operate in indoor/outdoor/mixed environments;
- Compliance with standards;
- Operational conditions (e.g., day/night) and temperature limitations.

All the devices will be modified accordingly in terms of software to fit with the RAWFIE ecosystem (e.g., compliance with Kafka message bus). Upon the completion of the project, the designed UGV equipment will become property of the RAWFIE Consortium.

- **Activity / Direction of enhancement 2: Addition & customization of Unmanned Aerial Vehicles.**

The basic idea behind the RAWFIE effort is the automated, remote operation of a large number of robotic devices for the purpose of assessing the performance of different technologies in the

networking, sensing and mobile/autonomic application domains. RAWFIE considers three kinds of vehicles; UGVs, USVs and UAVs. The project aims to feature a significant number of UxV nodes in order to establish an extended test infrastructure for RAWFIE related experimentation purposes. All these items will be managed by a central controlling entity which will be programmed per case and fully overview/drive the operation of the respective mechanisms (e.g., auto-pilots, remote controlled ground vehicles). Internet connectivity will be extended to the mobile units to enable remote programming (over-the-air), control and data collection.

*In the context of the 2^n RAWFIE Open Call, the project invites **manufacturers and providers of Unmanned Aerial Vehicles** to participate and expand the existing RAWFIE equipment. The project expects proposals that will provide and customize a considerable number of devices (>10) that belong to the UAV type of robotic devices. The exact number of devices considered by each proposal should comply with the requested funding and will be part of the evaluation process. Proposals considering higher number of devices will be considered favorably.*

The proposers should present clearly within the proposal text a number of features and characteristics of the unmanned vehicles that will be possibly considered as future additions to the project. These features include, but are not limited to, the following aspects of the vehicles:

- Processing capabilities (type of processors, number of cores, speed);
- Size and dimensions;
- Weight;
- Payload;
- Battery;
- Number and type or sensors;
- Number and type of integrated network components and supported communication interfaces;
- Minimum and maximum autonomy of the device;
- Auto-return capability (return to the base station automatically);
- Ability of the vehicle to operate as an access point;
- (Remote) Control interface;
- Over-the-air programming capabilities;
- Provision of collision avoidance mechanism;
- Compatibility with Apache Kafka architecture;
- Data storage of the vehicle;
- Support of "safe mode" operation;
- Localization capabilities (e.g., GNSS);
- Ability to operate in indoor/outdoor/mixed environments;
- Compliance with standards;
- Operational conditions (e.g., day/night) and temperature limitations.

All the devices will be modified accordingly in terms of software to fit with the RAWFIE ecosystem (e.g., compliance with Kafka message bus, read-only storage partition for remote shut-off of the devices, notifications to owners for OTA re-programming, etc.). Upon the completion of the project, the designed UAV equipment will become property of the RAWFIE Consortium.

- **Activity / Direction of enhancement 3: Scientific Excellence.**

RAWFIE comprises software architectures and developments for experimentation management, data collection and post-analysis. Virtualization is used to enable remote experimentation from everywhere in the world. In this 2nd Open Call, the project solicits for proposals that design and deploy extensive horizontal or domain-specific experimentation (experiment design & implementation, supportive software, data analysis, data visualization, etc.) that will leverage data and resources from RAWFIE testbeds and devices in the context of mobile IoT paradigm. **The experiments should come with a concrete plan on their scientific added value and the novelties that the experiment will bring in the scientific and research community (i.e., the new technologies and methodologies validated through the experiment, the new datasets it creates, etc.).**

All types of experimental applications should be based on RAWFIE tools and should come with additional features (e.g., post analysis of data, visualization tools) or software needed for further data processing. Horizontal experiments may refer to cross-domain applications and software (e.g., experimentation over a novel network protocol, information dissemination schemes, distributed architectures, data analysis methodologies, trust and reputation algorithms, security features, etc.). Supportive software should be connected with RAWFIE architecture to become available, if needed, for other types of applications and experiments. In all categories, the adoption of open technologies, specifications and standards (including open source software and Semantic Web technologies) that will enable the openness of the RAWFIE platform towards possible future expansion is strongly recommended.

Proposals should describe **experiments and applications** that validate novel technologies connected with the mobile IoT concept and its integration with Cloud and Robotics paradigms that clearly advance the current state-of-the-art and create added value at technology and research level. Based on the RAWFIE application creation tools, the experiments will design, implement and validate a number of proof-of-concept scenarios that could potentially be applied across several or specific application domains.

This software and the experiments should be of a short duration (a maximum of 12 months) starting from October 2017. Per proposal a budget can be requested for **up to a maximum of €100K**. The applicant should be **academia, industry (not SME) or a public body**.

- **Activity / Direction of enhancement 4: Innovation by SMEs.**

RAWFIE comprises software architectures and developments for experimentation management, data collection and post-analysis. Virtualization is used to enable remote experimentation from everywhere in the world. In this 2nd Open Call, the project solicits for proposals that design and deploy extensive horizontal or domain-specific experimentation (experiment design & implementation, supportive software, data analysis, data visualization, etc.) that will leverage data and resources from RAWFIE testbeds and devices in the context of mobile IoT paradigm. **The experiments should come with a concrete business model (i.e., how the results of the experiment may be transformed into profits for the company) and what kind of new markets the experiment may open.**

All types of experimental applications should be based on RAWFIE tools and should come with additional features (e.g., post analysis of data, visualization tools) or software needed for further data processing. Horizontal experiments may refer to cross-domain applications and software (e.g., experimentation over a novel network protocol, information dissemination schemes, distributed architectures, data analysis methodologies, trust and reputation algorithms, security features, etc.). Supportive software should be connected with RAWFIE architecture to become available, if needed, for other types of applications and experiments. In all categories, the adoption of open technologies, specifications and standards (including open source software and Semantic Web technologies) that will

enable the openness of the RAWFIE platform towards possible future expansion is strongly recommended.

Proposals should describe **experiments and applications** that validate novel technologies connected with the mobile IoT concept and its integration with Cloud and Robotics paradigms that clearly advance the current state-of-the-art and create added value at technology and research level. Based on the RAWFIE application creation tools, the experiments will design, implement and validate a number of proof-of-concept scenarios that could potentially be applied across several or specific application domains.

This software and the experiments should be of a short duration (a maximum of 12 months) starting from October 2017. Per proposal a budget can be requested for **up to a maximum of €75K**. The applicant should be an **SME**.

 * Experiments are required to be civilian-use only. Military applications are strictly forbidden.

Expected Timeplan

The following table provides an indicative timeplan for the four types of activity expected to be targeted by the proposals of the present open call.

Type of Activity	Expected Timeplan	Stage Description
Extension	**Delivery and customization stage:** Months 1 - 6.	The beneficiaries will deliver to the RAWFIE Consortium the robotic devices customized and ready to be used.
	Supporting stage: Months 7 - 18.	The UxV resources will participate in experiments.
Experimentation	**First prototype stage:** Months 1 - 6.	A first prototype of the experiment will be provided to the RAWFIE Consortium and an initial integration with RAWFIE platform will be demonstrated.
	Final delivery stage: Months 7 - 9.	The finalized version of the software completely integrated and tested with RAWFIE infrastructure is delivered.
	Full demonstration stage: Months 10 - 12.	Full demonstration to dissemination events. Minor modifications are expected according to the feedback of the consortium.

The proposals are expected to propose their own plan of documentation and deliverables that will be provided to the RAWFIE Consortium. The implementation plan will be subject to the evaluation criterion C3 ("Ability to implement"). The successful beneficiaries will be invited to refine and implement the final plan with the project coordinator and the other collaborators.

Practical Information

Total budget: up to € 1,950,000
Expected number of proposals to be funded: up to 19 (in total)
Maximum Commission funding per proposal: € 150 000 for RAWFIE-OC2-EXT, € 50 000 for RAWFIE-OC2-EXP

Expected budget foreseen for UxVs enhancements (in total): € 750,000

Expected budget for experiments (in total): € 1,200,000

Number of partners per proposal: Proposals should be submitted by single parties only. Consortia consisting of two or more partners will not be accepted.

Type of participants: The profile of participants targeting Activities 1 and 2 includes UxV manufacturers, and providers. The profile of participants targeting Activity 3 could be academics or industries with RTD department (not SMEs), and all kinds of private or public bodies active in the domains of IoT , Robotics, Autonomous Systems, Networking or Cloud Computing. The participants targeting Activity 4 should be SMEs. The rules of participation are the same as those applied to any H2020 project.

Duration of the contract: 18 months for RAWFIE-OC2-EXT (starting from July, 2017 to December, 2018) and 12 months for RAWFIE-OC2-EXP (starting from October, 2017 to September, 2018)

Language of the proposal: English

Proposal page limits and layout: According to the provided template, each proposal should consist of two distinct sections; Part A and Part B. Part A provides administrative information for the proposing party, while Part B provides information about costs, proposed plan and methodology, implementation and impact. Part B of each submitted proposal should not exceed **30 pages length for proposals targeting Extensions (Activities 1 & 2) and 25 pages length for proposals targeting Experimentation (Activities 3 & 4)** including cover page, abstract, table of contents, and sections B0, B1, B2, B3 of the provided template (Annexes are not part of the page limitation). There is no automatic check in the system. Experts will be instructed to disregard any excess pages in each section in which the maximum number of pages is indicated. The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers). Ensure that the font type chosen is clearly readable (e.g., Arial or Times New Roman).There is no page limitation for Part A since it consists of administrative forms. **A single document containing both parts A and B should be submitted.**

Feasibility check deadline (only for Experimentation activities RAWFIE-OC2-EXP-SCI, RAWFIE-OC2-EXP-SME): 19 February 2017, at 17:00 CET (Brussels local time)
Final submission deadline (for all four types of activities): 19 March 2017, at 17:00 CET (Brussels local

time)

Contact for information on this call: Prof. Stathes Hadjiefthymiades (UoA)

email: rawfie-contact@cnl.di.uoa.gr

Eligibility

Proposals may only be submitted by:

- Parties eligible for participation in the EC Horizon 2020 Framework Programme. Rules for eligibility can be found at:
  http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-a-countries-rules_en.pdf
- Single parties only.

A party may participate and submit multiple proposals. In case that multiple proposals coming from the same party pass the funding limits, RAWFIE Consortium has the right to decide which one of them will be accepted for funding.

Evaluation Criteria

Evaluation and ranking will be carried out by an external jury of individual experts. Proposals for third party funding will be evaluated against the following criteria:

C1. Relevance to the project architecture and technological excellence

All the contributions of third parties are intended either to enhance the current RAWFIE architecture or bring new value to it through novel experimentation. Therefore, the proposals should adhere to the requirements of the platform, and build on top of the existing framework. This criterion assesses the compliance of each proposal with RAWFIE technologies and adopted approaches. The technological excellence of the proposed solution and the level of integration with RAWFIE tools and platform are also evaluated. The quality of the proposed solutions will also be evaluated (e.g., number of robotic devices for Activities 1 and 2, complexity and innovation of the experiment for Activities 3 and 4, etc.).

C2. Impact

The funded proposals' impact (both on the project and in general) is evaluated. The open call seeks proposals which provide high added value. Proposals should enable possible future follow-up experiments and support the sustainability of the federated architecture. Market potential of the

proposals as well as their ability to provide significant value to the end-users will be taken into consideration. The funded third parties will also have to integrate their proposals outcome into the current RAWFIE infrastructure and maintain a connection to the RAWFIE Consortium until the end of the project. Further integration into a future RAWFIE federation is a major target for the project. In this context, this call also searches for participants that will stay active beyond the project lifetime. Hence, proposals with high levels of engagement with RAWFIE and the FIRE community will be promoted. The same stands with proposals that foresee and enable possible synergies with other H2020 projects and/or nationally funded activities. In the context of supported experiments, RAWFIE will promote innovation and excellence both in terms of horizontal cross-domain experiments and real-world domain-specific applications.

C3. Ability to implement

The proposers will be evaluated on their ability to implement the tasks. The experience and the technical capacity of the applicant(s) are of high importance. The proposed implementation plan should be clear and methodically sound, with a clear task statement, a solid design, a good methodology and of high quality. Participants are expected to propose a concrete plan that enables them to achieve the project goals during the given time-frame. The successful beneficiaries will be invited to refine and implement the final plan with the project coordinator and the other collaborators.

Each of the criteria is evaluated in a scale of 0-5. The threshold for each of the criteria is 3. The threshold for the total evaluation is 10.

In case of possible ties in ranking, the above criteria will be considered as listed in order of importance, i.e., criterion 1 is ranked higher than criterion 2, etc.

Redress

A third party (or consortium of 2 parties) may submit a redress request to the project coordinator within 7 days of the announcement of the evaluation and funding results. The redress request may involve only the procedural aspects of the evaluation. The request will be evaluated by the project Quality Control Board, a committee of 5 representatives of different project partners, and responded to within 10 days of its reception.