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| Wireless Software and Hardware platforms for  Flexible and Unified radio and network controL | | |
| **Open Call 5**  Fifth WiSHFUL Competitive Call for Experiments | | |
| Full Title of your proposal  Acronym of your proposal (optional) | | |
| Call[[1]](#footnote-1) - Identifier[[2]](#footnote-2) - Category[[3]](#footnote-3) | WiSHFUL-OC5-EXP- category | |
| Date of preparation of your proposal: | xx/yy/2017 | |
| Version number (optional): |  | |
| Your organisation name: | name | |
| Name of the coordinating person: | First name Last name | |
| Coordinator telephone number: | number | |
| Coordinator email:  [This is the email address to which the Acknowledgment of receipt will be sent] | Email address | |

Note: Grey highlighted areas need to be filled. Word template can be downloaded from WiSHFUL project website (see http://www.wishful-project.eu/open-calls)

# Section A Project Summary

*(Maximum 300 words – summary of the proposed work)*

*Remark: The information in this section may be used in public documents and reports by the WiSHFUL consortium.*

*This section needs to be completed in the draft proposal and will be used for the feasibility check (cf. Section D)*

# Section B Detailed description and expected results

*(minimum 4 pages, and maximum 6 pages)*

*This section describes the details on the planned Experiment (what does the proposer hope to obtain?, how?, why is it relevant?). This section should also include all information with respect to the State-of-the-Art, or a comparison to competing commercial wireless solutions in case of Experiments of category ‘Innovation by Industry’ to show the innovative character of the Experiment and the expected scientific or business impact.*

*This section needs to be completed in the draft proposal and will be used for the feasibility check (cf. Section D)*

## Concept and objectives

*Describe the specific objectives of the proposed Experiment, which should be clear, measurable, realistic and achievable within the duration of the Experiment (not through subsequent development). Show how they relate to the topic(s) addressed by the competitive call and how and why WiSHFUL is needed for realizing them.*

*Describe and explain the overall concept that forms the basis for your Experiment. Describe the main ideas, models or assumptions involved.*

## Impact

***For Experiments of category ‘’Scientific Excellence”:*** *Describe how this Experiment fits in your internal research roadmap, and to which extent the broader research community can benefit from the results of the Experiment.*

***For Experiments of category ‘’Innovation by Industry”:*** *Describe how this Experiment fits in your activities, and how this Experiment may strengthen the competitiveness of your business and the growth of your company. Having close contacts with possible end-users during this Experimental phase might be used to illustrate the business impact of the Experiment.*

***For any Experiment****: Show that the proposed Experiment has sufficient sustainable benefits for the WiSHFUL project, meaning that there should be an added value for the WiSHFUL project, after the proposer has finished his Experiment.*

## Description of State-of-the-Art

***For Experiments of category ‘’Scientific Excellence”:*** *Describe the advances the proposed Experiment would provide beyond the state-of-the-art, and the extent the Experiment is ambitious. Is this Experiment expected to lead to groundbreaking results or rather incremental results compared to existing work?*

***For Experiments of category ‘’Innovation by Industry”:*** *Describe in detail how the proposed solution compares with existing solutions in the field covered by the Experiment. Are there similar Experiments, products, services, etc. on the market? Is this Experiment incremental to existing work?*

## Methodology and associated work plan

*Provide a work plan. Provide clear goals and verifiable results, and also a clear timing.*

*The work plan involves at least the following phases:*

1. *Design of Experiment*
2. *Executing the Experiment*
3. *Analysis & feedback*

* *Analysis of the results of the Experiment*
* *Feedback on user experience*
* *Recommendations for improvements and/or future extensions of WiSHFUL software platforms, UPIs and testbeds*

1. *Showcase: Set up of a showcase (demonstration) to be used for the evaluation of the Experiment at the review meeting with the EC, and for further promotion of WiSHFUL*
2. *Dissemination: Regular dissemination actions (journal publications, conferences, workshops, exhibitions, FIRE events, advertising of results at WiSHFUL website, etc.)*
3. *Final report, code and documentation*

*NOTE: there is NO need to define work packages or deliverables. All results need to be reported in the final report at the end of the Experiment. Of course, a good communication plan with the Patron is required to exchange progress within different phases.*

# Section C Requested WiSHFUL software platforms, UPI interfaces, radio hardware platforms and testbeds

*Please check the WiSHFUL software platforms, UPI interfaces, radio hardware platforms and testbeds**that will be required for your Experiment.*

*Please visit the following websites to get details on the specific testbeds, hardware platforms, software platforms and UPIs:*

* http://www.wishful-project.eu/testbeds
* http://www.wishful-project.eu/software
* https://wishful-project.github.io/wishful\_upis/
* https://github.com/wishful-project

*This section needs to be completed in the draft proposal and will be used for the feasibility check (cf. Section D). Especially the usage the UPI interfaces must be clearly defined (with identification of specific functions and parameters).*

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| **TESTBEDS** | **Required (Yes/No)** |
| w.iLab.t (Heterogeneous wireless testbed @ imec, Ghent, Belgium) |  |
| IRIS (Software Defined Radio testbed @ TCD, Dublin, Ireland) |  |
| TWIST (Sensor testbed and openWRT router testbed @ TU Berlin, Berlin, Germany) |  |
| ORBIT (20 x 20 radio grid testbed @ Rutgers University, New Jersey, US) |  |
| FIBRE@UFRJ (OMF testbed @ UFRJ, Rio de Janeiro, Brazil) |  |
| WiSHFUL portable testbed |  |
| NITOS Testbed (network implementation testbed using open source platforms @ University of Thessaly, Volos, Greece) |  |
| LOG-a-TEC testbed (Josef Stefan Institute @Ljubljana, Slovenia) |  |
| KU Leuven testbed (KU Leuven @Leuven, Belgium) |  |
| ARNO testbed (SSSA @Pisa, Italy) |  |

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| **HARDWARE PLATFORMS** | | | |
| **Hardware** | **Type** | **Technology** | **Number of nodes required** |
| wireless Wi-Fi card | Atheros athxk, | IEEE 802.11 a/b/g/n |  |
| Broadcom b43 | IEEE 802.11 b/g |  |
| Wireless sensor node | RM090 | IEEE 802.15.4 |  |
| Zolertia Z1 | IEEE 802.15.4 |  |
| Zolertia RE-Mote | IEEE 802.15.4 |  |
| Jennic JN516X | IEEE 802.15.4 |  |
| VESNA | IEEE 802.15.4 |  |
| IEEE 802.15.4a (UWB) |  |
| Clean slate non-IEEE 802.15.4 |  |
| Sigfox | LPWAN UNB 868 MHz |  |
| Software Defined Radio (SDR) | WARPv3 | IEEE 802.11 b/g |  |
| USRP2-N210 | 2.4 – 2.5 GHz |  |
| 4.9 – 5.85 GHz |  |
| 50 – 860 MHz (RX only) |  |
| 800 – 1000 MHz |  |
| 1.5 – 2.1 GHz |  |
| 2.3 – 2.9 GHz |  |
| 50 MHz – 2.2 GHz |  |
| 400 MHz – 4.4 GHz |  |
| USRP2-N210 w/ beamforming | 400 MHz – 4.4 GHz |  |
| USRP-B200mini | 70 MHz - 6 GHz |  |
| USRP X310 | 10 MHz – 6 Ghz |  |
| USRP B210 | 70 MHz - 6 GHz |  |
| LTE | Airspan | 2.59 GHz TDD |  |
| ip.access (+ SIRRAN EPC SW core) | 2500-2570 MHZ (indoor uplink)  2620-2690 MHZ (indoor downlink)  2.53-2.63 GHz (outdoor) |  |
| srsLTE | USRP based, 2.4-5 GHz |  |
| OpenAir Interface | Virtual eNB, EPC |  |
| TVWS | SNE-ESHTER | 470-862 MHz |  |
| Full Duplex Radio | NI USRP-2943R  NI USRP-2952R | 1.2 - 6 GHz  0.4 - 4.4 GHz |  |
| Antenna | RAS (Reconfigurable Antenna System) | 2.4 GHz  5 GHz |  |

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| **SOFTWARE** | |
| **OPERATING SYSTEMS** | **Required (Yes/No)** |
| Linux |  |
| Contiki |  |
| TinyOS |  |
| **PLATFORMS** | **Required (Yes/No)** |
| Wireless MAC Processor (WMP) |  |
| Time-Annotated Instruction Set Computer (TAISC) |  |
| Generic Internet-of-Things ARchitecture (GITAR) |  |
| IRIS Software Radio |  |
| GNU Radio |  |
| Full Duplex |  |

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| **UPI Interfaces**  *Please list the UPI functions that are needed to support your Experiment together with the parameters of interest. Try to be as specific as possible.* |
| Unified Programming Interface – Radio (UPIR) |
| [Example:  UPI function: wishful\_upis.radio.get\_measurements  Parameters: RSSI, SNR, BER, TX\_ACIVITY, NUM\_TX\_SUCCESS |
| [Another example:  wishful\_upis.wifi.radio.set\_modulation\_rate |
|  |
| Unified Programming Interface – Network (UPIN) |
| [Example:  UPI function: wishful\_upis.net.set\_parameters  Parameter: ROUTING\_MAX\_TTL |
| [Another example:  wishful\_upis.net.inject\_frame(iface, frame, is\_layer\_2\_packet, tx\_count=1, pkt\_interval=1) |
|  |
| Unified Programming Interface – Global (UPIG) |
| [mention here the functions that will be called remotely together with the parameters that will set/controlled remotely) |
|  |
|  |
| Unified Programming Interface – Hierarchical (UPIHC) |
| [describe what kind of information will be exchanged in a hierarchical way]  [Example: the global control program sends control policies to local control programs, to be executed locally when the connectivity between them is not more available] |
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| **Intelligence Components** | **Required (Yes/No)** |
| WiSHFUL UPI exec component |  |
| Measurement collection component |  |
| Feature generation component |  |
| WECA based model training component |  |
| Interference classification component |  |
| Surrogate model creation and optimization |  |
| 802.15.4 MAC layer performance data set |  |
| Technology classification dataset |  |

*Please provide a short motivation on why specific testbeds, hardware platforms, software platforms, intelligence components, and/or UPIs will be required for the proposed Experiment. (maximum ½ page)*

# Section D Compliance check

*(maximum 1 page)*

*This section contains the feedback from the WiSHFUL partner acting as Patron on this Experiment. Each proposing party must contact the WiSHFUL consortium regarding its submission to identify a possible Patron. This Patron can be the WiSHFUL partner responsible for the testbed, hardware or software platform the proposer will use during its Experiment. The proposing party must submit its draft proposal to this Patron by Monday 25 September 2017 at 17:00. The feedback by the Patron is copied into this section of the proposal.*

# Section E Background and qualifications

*(maximum 2 pages)*

*This section describes the proposer and includes an overview of the activities, the proposer’s qualifications, technical expertise and other information to allow the reviewers to judge the proposer’s ability to carry out the Experiment.*

# Section F Expected feedback to the WiSHFUL Consortium

*(maximum 2 pages)*

*This section contains valuable information for the WiSHFUL consortium and should indicate the expected feedback the WiSHFUL consortium can expect from the use of its software platforms, hardware platforms and/or testbeds after carrying out the Experiment. This information is essential in view of the further improving the WiSHFUL software platforms and UPIs, and the testbeds. Note that providing this feedback is one of the key motivations for the existence of the WiSHFUL open calls.*

# Section G Requested funding

*(maximum 1 page)*

*This section provides an overview of the budgeted costs and the requested funding. A split is made in personnel costs, other direct costs (travel, consumables, etc.) and indirect costs.*

*Besides the table below, extra information can be provided to support the requested funding and which may help to judge the cost to the WiSHFUL project.*

*Please show your figures in euros (not thousands of euros).*

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| --- | --- | --- |
|  | **Total PM** | **Cost (**€**)** |
| (1) Direct personnel costs |  |  |
| (2) Other direct costs, of which: | |  |
| Travel | |  |
| Equipment | |  |
| Other goods and services | |  |
| (3) Indirect costs | |  |
| (4) Total costs (Sum of 1, 2 and 3) | |  |

*In row (1), insert your direct personnel costs for the work involved.*

*In row (2), insert any other costs, for example travel or equipment costs. Please allocate sufficient budget for participation at the final review meeting, and visit(s) to WiSHFUL partners, in case this is required in view of advanced support by the Patron.*

*In row (3), calculate the indirect costs (for personnel and other direct costs)*

*In row (4), calculate the sum of your personnel, other direct costs and indirect costs.*

*The maximum funding which is allowed in this call is set at 50 000 € for an Experiment of the category ‘Scientific excellence’, and 40 000 € for an Experiment of the category ‘Innovation by Industry’,*

*In view of the review of your proposal it is best to list the costs related to the proposed Experiment as would be done for any European Project.*

# Section H Use of proposal information

*In this section the proposing party is asked to include some statements related to sharing information of his proposal within the WiSHFUL consortium.*

*Proposals are treated in a confidential way, meaning that only successful proposals must be disclosed to the WiSHFUL consortium. Open calls previously organized by other FIRE projects were very successful and have revealed that many submitted non-granted proposals also contain very interesting and valuable information that could be used for setting up collaborations or to extract ideas for further improving the federated test infrastructures. Therefore the WiSHFUL project would like to have the opportunity to collect more detailed information and further use this information, also if the proposal is not selected for funding. In any case, the WiSHFUL consortium will treat all information of a proposal confidentially.*

*Two types of information usage are envisaged:*

* *Information which is part of the Sections A, C, D and F will be used within the WiSHFUL project as input for tasks related to testbed and software platform optimizations, sustainability studies, etc. The same information can also be used in an anonymous way to create statistics and reports about this first open call. All proposals submitted to this competitive open call are obliged to allow this form of information access and usage.*
* *Other information belonging to this proposal might also be accessed by the WiSHFUL consortium, if allowed by the corresponding proposer. Any use of such information will be discussed and agreed upon with the proposers. Proposers have the freedom to select if they wish to support this kind of information usage.*

Top of Form

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| I allow that the material provided in Sections A, C, D and F of this proposal may be accessed by the WiSHFUL consortium, also if the proposal is not selected for funding. In any case, the WiSHFUL consortium will treat all this information confidentially. It will be used within the WiSHFUL project as input for tasks related to testbed and software platform optimizations, sustainability studies, etc. The same information can also be used in an anonymous way to create statistics and reports about this first open call. | Yes |
| Furthermore, I allow that the other parts of this proposal may be accessed by the WiSHFUL consortium, also if the proposal is not selected for funding. In any case, the WiSHFUL consortium will treat all information of this proposal confidentially. Any use of this information will be discussed and agreed upon with the proposers. | Yes | No |

Bottom of Form

# Section I Involvement in FIRE-projects

In this section proposers need to list their involvement in FIRE-projects, either as full partner or as successful proposer in Open Calls from FIRE-projects.

Proposals originating from new players in the FIRE community will be positively discriminated and will receive a higher score.

1. This call: WiSHFUL-OC5 [↑](#footnote-ref-1)
2. ’Experiments (EXP)’ [↑](#footnote-ref-2)
3. ‘Scientific Excellence (EXC)’ or ‘Innovation by Industry (IND)’ [↑](#footnote-ref-3)