Proposal Evaluation Form

EUROPEAN COMMISSION

Horizon 2020 - Research and Innovation Framework Programme

Evaluation Summary Report

Call: H2020-MSCA-IF-2014_RI
Funding scheme: RI – Reintegration panel
Proposal number: 655505
Proposal acronym: HPRTERHLC
Duration (months): 24
Proposal title: High Performance Real Time Event Reconstruction for High Luminosity Collider
Activity: MSCA-IF RI

N.	Proposer name	Country	Total Cost	%	Grant Requested	%
1	ISTITUTO NAZIONALE DI FISICA NUCLEARE	IT	180,277	100.00%	180,277	100.00%
	Total:		180,277		180,277	

Abstract:
The goal of this project is to advance the real-time pattern recognition device and algorithms, within the context of the High Energy Physics (HEP), with a possible use in other fields, where real-time data reconstruction and feature extraction is important: such as national security or stock market monitoring. Modern HEP experiments, such ATLAS or CMS located on the CERN's Large Hadron Collider (LHC), collect 14 TeV proton-proton collision events to study the fundamental interactions of the nature, searching for rare and unexpected events to test the current standard model of particle physics and shed light on phenomena not explained by such model such as the existence of the dark matter or the large matter and anti-matter asymmetry in the universe. The LHC will provide an enormous amount of data, however only a tiny fraction of the collisions can be saved on disk for data analysis, requiring an immense real-time data reduction from about 70 TB/s down to 1 GB/s, with the goal to reject uninteresting events. This project wants to contributed to the initial operations of the ATLAS Fast Tracker (FTK), designed to improve the performance of the current multi-level trigger, introducing a coprocessor devoted to the reconstruction of charged particles' tracks in the whole inner detector. The FTK processor combines FPGA and special memory chips, the Associative Memory (AM), in order to collect the computing power required to implement complex real-time track reconstruction algorithms, with a relatively low consumption electronics. The goal of the project is also to contribute to the evolution of the FTK and the AM technology, studying improvements to the algorithms and technological evolution of the memory device that thanks to the multicore technology can combine the specialization of the AM with the computing power of the FPGA in a single chip.

Evaluation Summary Report

Evaluation Result

Total score: 86.40% (Threshold: 70.0/100.00)

Form information

SCORING

Scores must be in the range 0-5.

Interpretation of the score:

0– *The* ***proposal fails to address the criterion*** *or cannot be assessed due to missing or incomplete information.*

1– Poor. *The criterion is inadequately addressed, or there are serious inherent weaknesses.*

2– Fair. *The proposal broadly addresses the criterion, but there are significant weaknesses.*

3– Good. *The proposal addresses the criterion well, but a number of shortcomings are present.*

4– Very good. *The proposal addresses the criterion very well, but a small number of shortcomings are present.*

5– Excellent. *The proposal successfully addresses all relevant aspects of the criterion.Any shortcomings are minor.*

* mandatory fields

Criterion 1 - Excellence

Score: **4.30** (Threshold: 0.00/5.00 , Weight: 50.00%)

Quality, innovative aspects and credibility of the research (including inter/multidisciplinary aspects)
Clarity and quality of transfer of knowledge/training for the development of researcher in light of the research objectives
Quality of the supervision and the hosting arrangements
Capacity of the researcher to reach or re-enforce a position of professional maturity in research

Strengths:
+ The project is part of a global effort to improve the performance of Hadron Collider experiments, and is of very good quality. The objectives are timely and scientifically relevant.
+ The project, building a Fast Tracker for future experiments, FTK, is multidisciplinary.
+ The scientific quality of the hosting team and of the supervisor are very good.
+ The researcher is very good. He has already demonstrated a capacity for leadership and assuming of responsibilities. The project will reinforce his professional maturity in research.

Weaknesses:
- Transfer of knowledge is limited by the fact that the researcher has been working with the same group in this direction, with fellowships at the same institution, for quite some time.
- The proposal does not provide detailed information on the supervisor's experience in training of experienced researchers.

Overall comments

Not provided

Criterion 2 - Impact

Score: **4.30** (Threshold: 0.00/5.00 , Weight: 30.00%)

Enhancing research- and innovation-related human resources, skills, and working conditions to realise the potential of individuals and to provide new career perspectives
Effectiveness of the proposed measures for communication and results dissemination

Strengths:
+ The participation in the highly competitive global FTK project will help the fellow to acquire new skills.
+ The fellowship, and the secondment at two private firms, will be beneficial to the fellow's career possibilities, both in and outside the public sector.
+ The proposed measures for dissemination follow standard practice in high energy physics, and are very good.

Weaknesses:
- Realistic, new career perspectives at the host institution after the fellowship are not discussed in the proposal in sufficient detail.
- The fellow plans to participate in the established outreach programs of INFN, however his individual actions and the effectiveness of the present measures are not discussed beyond generic statements.

Overall comments

Not provided

Criterion 3: Implementation

Score: **4.40** (Threshold: 0.00/5.00 , Weight: 20.00%)

Overall coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources
Appropriateness of the management structures and procedures, including quality management and risk management
Appropriateness of the institutional environment (infrastructure)
Competences, experience and complementarity of the participating organisations and institutional commitment

Strengths:
+ The work plan is good and sufficiently detailed. It is well structured, with an appropriate description of tasks to be performed and good allocation of resources.
+ Appropriate risk assessments and contingency plans have been presented.
+ The institution and the research group, where the applicant will work, are both good and appropriate for the tasks to be performed. The infrastructures available for this project are very good.

Weaknesses:
- The complementarity between the fellow and the host institution is not convincingly presented in the proposal. Namely, the applicant as well as the host institution are part of the same subgroup (of a very large international collaboration), and have been already working on the FTK project. A clear description of the full range of complementary competencies is not provided in the proposal.

Overall comments

Not provided

Operational Capacity

Status: **Operational Capacity: Yes**

Not provided

Remarks

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