

Proposal Evaluation Form



EUROPEAN COMMISSION

Horizon 2020 - Research and Innovation Framework Programme

Evaluation
Summary Report

Call: H2020-MSCA-IF-2014_ST
Funding scheme: Standard EF
Proposal number: 659178
Proposal acronym: CAPTA
Duration (months): 24
Proposal title: Complexity through Automata, Proof Theory and Algebra
Activity: MAT

N.	Proposer name	Country	Total Cost	%	Grant Requested	%
1	KOBENHAVNS UNIVERSITET	DK	212,195	100.00%	212,195	100.00%
Total:			212,195		212,195	

Abstract:

Complexity through Automata, Proof Theory and Algebra (CAPTA) will provide implicit and intentional definitions of complexity classes, by taking intuitions and tools from Linear Logic and the Geometry of Interaction program, using strong links between classes of complexity and automata theory that have not been properly exploited yet. Abstract definitions of classes of complexity are given by observing the dynamics resulting from the interaction of programs with a specific kind of input, and by identifying the algebra where their interpretations live. Whereas all the previous results in Implicit Computational Complexity (ICC) provided extensional machine-independent characterizations by restricting the syntax, CAPTA will push the abstraction, the 'dematerialisation', further by intentionally quotienting programs of the same complexity. The aims of CAPTA are to 1) provide semantic and implicit characterization of complexity classes in algebraic terms, a new tool to attack classical problems of inclusion and separation among complexity classes; 2) switch from a predicative to a functional setting, to develop a 'built-in' compositionality that abstracts away painful composition of space-limited programs; and 3) extract new syntactical restrictions on programming languages and type systems thanks to a 'reverse engineering' in the spirit of Geometry of Interaction. It differs from previous approaches by evacuating the syntax and using results on automata that were never considered from an ICC perspective. It connects communities working in ICC with different approaches, Linear Logic for the French and Italian side, descriptional and algebraic complexity for the Danish and German side.

Evaluation Summary Report

Evaluation Result

Total score: 83.60% (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: **4.40** (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 originality of the approach to complexity classes, based within the unconventionality of the researcher's combination of training and interests, is clearly outlined.
- There is a comprehensive itemisation of specific topics and individuals that can be expected to play a role in a two-way transfer of knowledge.
- The researcher's achievements are good and the project has a good potential to improve the applicant's competencies.
- The supervisor is an expert in the field, offers an extension to the researcher's background, and has a high level of experience.
- There is a clear description of the multidisciplinary.

Weaknesses:

- Even though broad objectives are indicated, more details are needed.
- The proposal lacks specificity at certain points with regard to the method to be adopted, somewhat reducing credibility.
- No career development plan is presented.

Overall comments

Not provided

Criterion 2 - Impact

Score: **4.00** (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:

- Besides the standard effects of improved publication record, teaching and supervision skills, partner interaction, the strongest aspect of the impact is that it provides the applicant with the opportunity to develop new and state-of-the-art competences in the selected field of research.
- The project is expected to bring a wider European dimension to the research and contacts to the researcher.

Weaknesses:

- Even though outreach activities are mentioned, a more detailed description is not provided.
- It is insufficiently justified how the proposed project could contribute to realizing the potentials of the researcher or to provide new carrier perspectives.
- The impact envisaged is primarily directed to a very narrow community, with a tendency to mathematical marginalization.

Overall comments

Not provided

Criterion 3: Implementation

Score: **3.90** (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 description of the work plan is appropriate.
- The management plans both at institutional and project levels are clearly and comprehensively described.
- Risk management strategies are provided in relation to the work packages.
- The proposal clearly describes the strong scientific context, with names of researchers on-site, the office facilities to be made available, the good level of IT resources provided, and the experienced administrative support in place.

Weaknesses:

- The content of the research and the nature of outcomes and how to reach them is not fully clarified.
- No deliverables or milestones are given, and no mechanism for quality control is provided.
- The allocation of resources to tasks requires more justification.

Overall comments

Not provided

Operational Capacity

Status: **Operational Capacity: Yes**

Not provided

Remarks

No remarks.