H.F.R.I.
Hellenic Foundation for Research & Innovation

Description of the funded research project

1st Call for H.F.R.I. Research Projects to Support Faculty Members & Researchers and Procure High-Value Research Equipment

Title of the research project: DebateLab: From Linked Data to Linked Arguments (HFRI-FM17-4195)

Principal Investigator: Dimitris Plexousakis

Reader-friendly title: DebateLab

Scientific Area: Mathematics and Information Sciences

Institution and Country: FORTH-ICS, Greece

Host Institution: Foundation for Research and Technology, Hellas (FORTH)

Collaborating Institution(s): National Centre for Scientific Research “Demokritos” (NCSRD)

Project webpage (if applicable): https://debatelab.ics.forth.gr/

Budget: 169.333,92

Duration: 36 months

Research Project Synopsis

The Web is transforming rapidly from a Web of information to a Web of Opinions, where people upload their viewpoints, ratings and comments on any conceivable topic. Unfortunately, this plethora of opinions and the corresponding arguments are effectively lost; the arguments are not uploaded as machine-processable data, they are not interlinked, and it is extremely difficult for Web users to find arguments related to a particular subject, let alone to evaluate them. DebateLab aims to conduct basic and applied research towards developing the theoretical framework for representing, mining and reasoning with online arguments. Exploiting progress in the fields of Knowledge Representation and Reasoning, Semantic Web, Natural Language Processsing, Information Retrieval and Machine Learning, this project aims to pave the way for a new Web paradigm, a modern agora, where the different types of arguments and human deliberation can be amenable to machine-interpretable representation and algorithmic processing. While the basic research will progress in a domain independent manner, the applied research will focus on the domain of e-Journalism, in order to produce exploitable outcome of both theoretical and practical value. DebateLab will be conducted at FORTH-ICS in collaboration with SKEL-NCSR “Demokritos”, by a balanced consortium comprising senior, principal and postdoctoral researchers, PhD students and a software engineer.

Project originality

DebateLab will conduct research towards developing the theoretical infrastructure for representing, mining and reasoning with online arguments, while also delivering a suite of tools and services supporting the uptake and initial exploitation of the related technologies. This research will pave the way for a new Web paradigm, a modern agora, where the different types of arguments and human deliberation can be amenable to machine-interpretable representation and algorithmic processing.

The aforementioned research builds on the vision of the Argument Web, which foresees a structured Web of linked arguments, a Web populated with justified opinions that can be both human-retrievable and machine-processable. DebateLab will support this vision by contributing novel theoretical models for argument representation, reasoning and evaluation, as well as tools for mining, linking and retrieving arguments. While the logical argument, which is at the core of the Argument Web vision, can facilitate the logic-based reasoning process of argumentation, our goal in DebateLab is to go beyond the typical characteristics of arguments and enhance them with social semantics and extra-logical processes, such as profile and context analysis, audience analysis and sentiment analysis. The project will exploit the developments made in the Argument Web with respect to argument modelling, annotation and visualization, but will further extend them to cover the requirements of Web dialogues.

Expected results & Research Project Impact

To showcase the value and applicability of the research within DebateLab, we will concentrate on the domain of e-Journalism. The envisioned DebateLab outcomes will involve both a set of e-Journalism tools that cover a broad range of domain-specific tasks, as well as more general methodologies, such as recommendation and clustering algorithms, relevant APIs etc. that are orthogonal to the domain of use. The intended outcomes (summarized in the table below), will be demonstrated towards the end of the project. The envisioned tools are, to the best of our knowledge, novel, and will greatly enhance the capabilities of journalists and readers alike in identifying, assessing and exploring arguments to form opinions on critical matters of current interest.

ID	Project Output (Workpackage/Deliverable)	TRL
1	Argumentation ontology (WP3/D3.1)	5 -> 7
2	Reasoning methods (WP3/D3.2)	3 -> 6
3	Argument association and linking (WP3/D3.3)	2 -> 5
4	Argument mining/Argument Base population (WP4/D4.1,D4.2)	4 -> 7
5	Argument seeking (WP4/D4.3,D4.4)	1 -> 5
6	API and services (WP5/D5.1,D5.2)	3 -> 6
7	Annotation and visualisation tools, debate portals (WP5/D5.1,D5.2)	5 -> 9
8	Exploration, recommendation, analysis tools (WP5/D5.1,D5.2)	2 -> 5

The importance of this funding

Despite its practical final aim, which is the development of tools for e-journalism, DebateLab is, by its nature, focusing mostly on basic research. Basic research funding is scarce, and, thus, the opportunity given to us by H.F.R.I. is most welcome, and allows the development of an idea that was being considered for several years, but postponed due to lack of funding.

We firmly believe that the funding of DebateLab will lead to contributions in computational models of argumentation and methodologies that can be applied over the Web, in order to support and further promote the powerful social phenomenon of online communication. We see DebateLab as the platform of ideas that holds the promise for promoting the role of humans in collective decision-making, e-governance and e-democracy, able to have significant impact at both the individual and the societal level. The expected impact will affect the scientific community in the short and medium term, but will also open opportunities for economical and societal impact in the short, medium and long term; H.F.R.I. funding will enable this. From the practical perspective, the usefulness of the project is evidenced by the already established collaborations with various journalists, who have shown enthusiasm for the envisioned tools, and have expressed their desire to use and evaluate them, when ready.

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