

DebateLab Tools for E-Journalism and Informed Citizenship

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ABSTRACT

We describe DebateLab, a project which aims to conduct research towards developing the theoretical infrastructure for mining, representing and reasoning with arguments found online, while delivering a suite of tools and services supporting the uptake of the related technologies. DebateLab will pave the way for a new Web paradigm, where the different types of arguments and human deliberation will be amenable to algorithmic processing and machine-interpretable representation. Towards this, DebateLab analyzes articles with argumentative content to provide tools that will be useful for the professional journalist, but also for users who want to be better informed regarding public debates.

CCS CONCEPTS

Ontologies, Web searching and information discovery

KEYWORDS

Argument Mining, Computational Argumentation, e-journalism

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1 The DebateLab Setting

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, via blogs, social media, websites, etc. The plethora of opinions currently flooding the Web are not uploaded as machine-interpretable data, so it is difficult to identify arguments related to a certain topic, let alone evaluate them, or assess them based on objective and subjective criteria.

DebateLab¹ pioneers research towards unlocking the potential of the new dialectical nature of the Web, leveraging on advances in Computational Argumentation, Natural Language Processing, Information Retrieval, and the Semantic Web. DebateLab aims (a) to conduct research towards the required theoretical infrastructure for representing, mining and reasoning with online arguments, and (b) to develop a suite of tools for the e-journalism domain, which will enhance current newsroom processes, and will also have impact on interested users, by supporting informed citizenship.

The DebateLab project is designed to deal with real arguments, extracted from existing corpora, and applied in the field of online journalism which is a suitable testbed for our vision towards a more argumentation-oriented Web. Our ultimate, long-term goal is to pave the way for a new Web paradigm, a modern agora, where arguments and human deliberation can be amenable to machine-interpretable representation and algorithmic processing.

DebateLab started on 1/1/2020, and ends on 30/06/2023. It is funded by H.F.R.I. and employs two partners, FORTH-ICS (coordinator) and NCSR “Demokritos”. We are supported by

¹ <https://debatelab.ics.forth.gr/>

renowned experts from the University of Dundee, as well as journalists who contributed during requirements elicitation.

2 The DebateLab Solution

The DebateLab workflow consists of the following steps (see also Figure 1): (a) mining arguments; (b) processing the mined arguments and ingesting them in the DebateLab database in an appropriate structured form; (c) providing sophisticated access and visualization functionalities over the structured arguments; and (d) providing a set of frontend tools allowing the user to access this information. We analyze these steps in the sequel.

Argument mining identifies and extracts arguments from news articles, harvested from over 1300 RSS news sources and user generated content. A mined argument consists of smaller readable segments, called Argumentative Discourse Units (ADUs), each of which may be a premise or a claim of an argument. The mining process also identifies relations among ADUs (attack or support), which are subsequently used to determine argument relations.

The next step in the pipeline is to **process the raw information** provided by argument mining before storing it in the DebateLab database. Towards this, we developed an ontology based on the popular Argument Interchange Format (AIF) [1]. Appropriate reasoning processes are used on top of the information provided by argument mining in order to determine argument relationships and useful metadata, which are then stored in the DebateLab database. An appropriate scoring mechanism is used to assess arguments along various dimensions (e.g., credibility, popularity, quality, acceptance), based on previous work by FORTH [3]. Further, the linking process is used to identify important entities in ADUs, and to associate them with external data sources, using links to related articles, DBpedia data or other items that may help the user assess their quality, trustworthiness or acceptability [2].

For **accessing** the information in the DebateLab database, we employ ArgQL, a declarative, specialized high-level query language for argumentative information [5]. The usefulness of the query results for the user is enhanced through appropriate **visualizations** created using the well-known D3 library².

Regarding the **frontend tools**, DebateLab is currently developing the Argument Navigator, the Personal Article Archiver, the On-demand Article Crawler and the Enhanced Debate Portal, each of which aims to satisfy a specific set of user needs, as identified in our meetings with journalists during the requirements elicitation phase. A demo to showcase these tools will soon be available for evaluation by interested users.

The Argument Navigator is the main DebateLab tool, allowing sophisticated browsing, searching, and exploration facilities over arguments stored in the DebateLab database. The tool provides an intuitive interface that allows users to employ an interactive, exploratory argument seeking paradigm, where the user navigates through the arguments and their structure without explicit knowledge of the underlying query language used for accessing the DebateLab database. Visualizations and other visual cues will be heavily used to enhance the user experience.

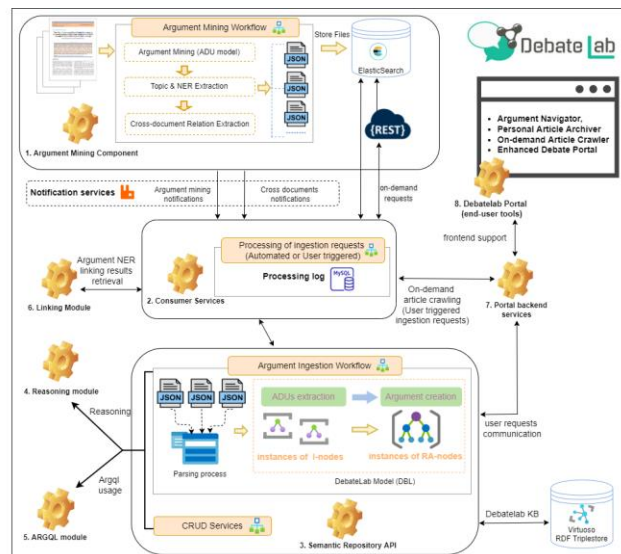


Figure 1. The DebateLab system architecture

The Personal Article Archiver aims to satisfy the journalists' need to store, organize, manage, annotate and have quick access to shortlists containing their own articles, or interesting articles written by others. The tool is integrated with the Argument Navigator, allowing users to restrict search only to shortlisted articles, or to add items in the shortlist through the Navigator.

The On-demand Article Crawler allows a user to request crawling a certain article, in order to improve the coverage of the DebateLab database. During on-demand crawling, the user can (optionally) provide additional information (metadata) on the article to be stored in the DebateLab database.

The Enhanced Debate Portal enables structured discussions among journalists and users. It provides a range of functionalities, allowing journalists to pose questions or debates, and users to express related arguments. Appropriate visualizations and functionalities allow the analysis of the ensuing dialogue, in a spirit analogous to debating platforms such as APOPSIS [4].

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² <https://d3js.org/>