APOPSIS: A Web-based Platform for the Analysis of Structured Dialogues

Elisjana Ymeralli
FORTH-ICS, Institute of Computer Science
Heraklion, Greece
ymeralli@ics.forth.gr

Giorgos Flouris
FORTH-ICS, Institute of Computer Science
Heraklion, Greece
fgeo@ics.forth.gr

Theodore Patkos
FORTH-ICS, Institute of Computer Science
Heraklion, Greece
patkos@ics.forth.gr

Dimitris Plexousakis
FORTH-ICS, Institute of Computer Science
Heraklion, Greece
dp@ics.forth.gr

ABSTRACT

In this paper, we describe a web platform for modeling and analyzing argumentative discussions by offering different means of opinion analysis, allowing the participants to obtain a complete picture of the different metrics[1] of each individual opinion. The system applies a semantic representation for modeling the user-generated arguments and their relations, a formal framework for evaluating the strength value of each argument and a collection of Machine Learning algorithms for the clustering of features and the extraction of association rules.

KEYWORDS

Debating portal; Structured dialogues; Opinion analysis; Clustering; Multi-aspect evaluation

1 INTRODUCTION

In this work, we introduce a web-based platform for represening and analyzing online discussions. The system, called *APOPSIS*[2], provides a debating environment that aims to motivate people to rebut to other user's posts by defending and justifying their opinions[3]. As a debating platform, it enables users to raise issues, ask their own questions, post supporting or counter-arguments and vote. The overall objective is to offer different means of analysis of the debates, in order for the participants to obtain a complete picture of the opinions expressed within each debate.

2 METHODOLOGY: PLATFORM

The platform provides a range of functionalities that enrich the system usability, the most important of which are mentioned below:

2.1 Structured Dialogues

The system offers well-structured dialogues and each dialogue is open for discussion with users posting comments in support of or against other answers. The platform uses an RDF-ontology and an argumentation approach based on the (IBIS)[1] model for organising each dialogue. Moreover, the debates proceed in two phases: the first one is an open dialogue where users share their ideas on specific issue; the positions that attract significant acceptance by

the participants progress to the second phase by a moderator, who is charged with the task of ensuring the quality of dialogue.

2.2 Argument Evaluation

APOPSIS relies on a formal framework for evaluating the strength value of arguments, called sm-Dice[2] . The strength of each argument is calculated based on a multi-aspect evaluation that considers criteria, such as the *correctness*, *relevancy* and *sufficiency* of arguments. Eventually, the score of an argument depends on these criteria and comprises two values: the *acceptance score* and the *quality score*. The former denotes the level of conformity of the expressed opinion, while the latter characterizes how well-explained or justified the argument is.

2.3 Analytics

A key component of this work is the clustering analysis that aims to help users identify useful trends and patterns relationships among participants towards the better sense-making of the dialogues. The opinion analysis covers different information needs emerging from users, focusing not only on arguments, but also on user profile characteristics[3]. A collection of machine learning algorithms[3] is applied for the clustering of features and the extraction of association rules. Visualization tools[4] are used for the graph representation of opinion analysis.

3 CONCLUSION

Regarding future work, there are several aspects that are worth investigating. Specifically, the process will include adjustements based on expert evaluation results, user-based evaluation with UI experts and with real-users in a laboratory settings.

REFERENCES

[1] Werner Kunz and Horst WJ Rittel. 1970. *Issues as elements of information systems.* Vol. 131. Citeseer.
[2] P Patkos, Giorgos Flouris, and Antonis Bikakis. 2016. Symmetric multi-aspect evaluation of comments. In *ECAI 2016-22nd European Conference on Artificial Intelligence, 29 August-2 September 2016, The Hague, The Netherlands*, Vol. 285. IOS Press, 1672–1673.
[3] Jodi Schneider, Tudor Groza, and Alexandre Passant. 2013. A review of argumentation for the social semantic web. *Semantic Web* 4, 2 (2013), 159–218.

---

[1] *validity*, *justification* strength, *acceptance value*
[2] http://www.ics.forth.gr/isl/apopsis

---

[3] K-means and Apriori algorithms
[4] D3.js library