

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

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1. Motivation

We introduce a web debating platform for modeling and analyzing argumentative discussions by offering different means of opinion analysis, that aims to help contributors in understanding the different clusters of opinions. This way, sense-makers obtain a clear picture of the **validity**, the **justification strength** and the **acceptance** of each individual opinion.

The platform provides a range of functionalities :

- A semantic representation for organizing and representing the user-generated arguments and their relations.
- A formal framework, called s-mDiCE, for evaluating the strength value of each argument individually,
- A collection of Machine Learning Algorithms (ML) for the clustering of features and the extraction of association rules.

2. Knowledge Map Schema

This argument map is designed and meant to organize discussions, through Semantic Web technologies for making opinions and their relations available in the form of RDF statements.

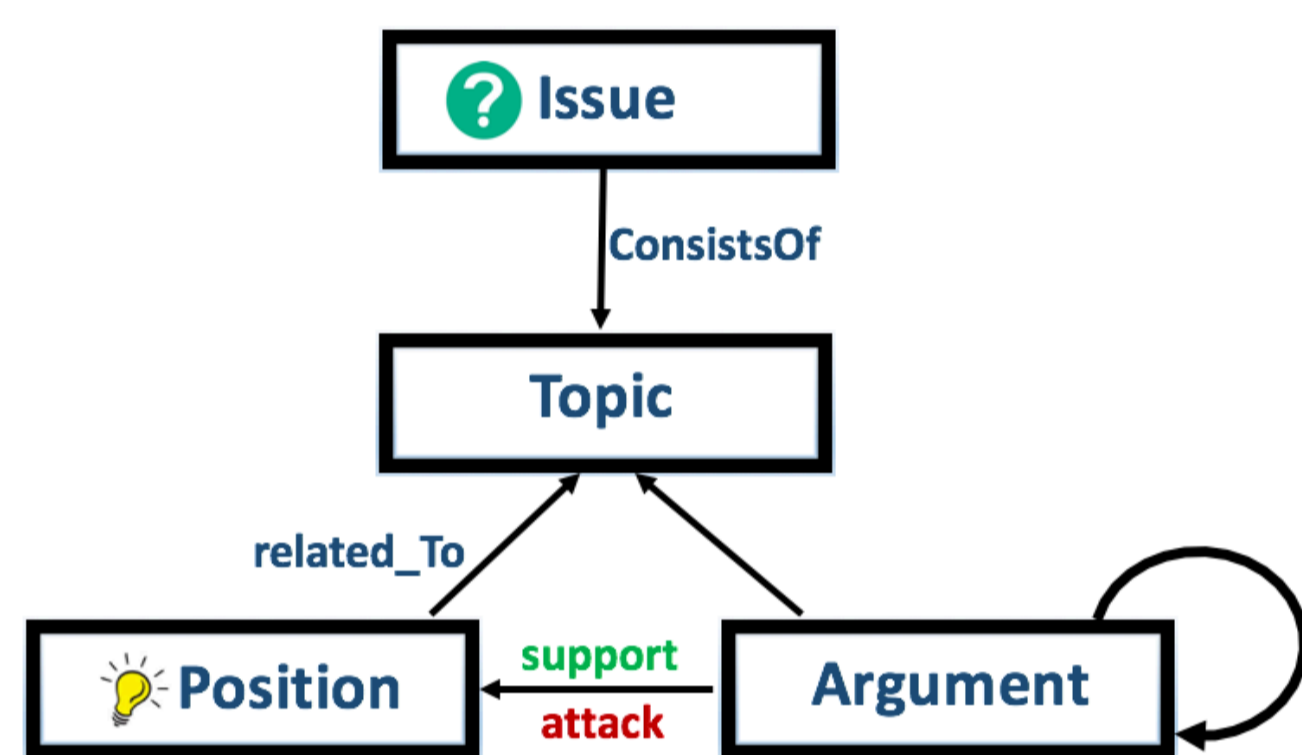


Fig. 1. Argument map

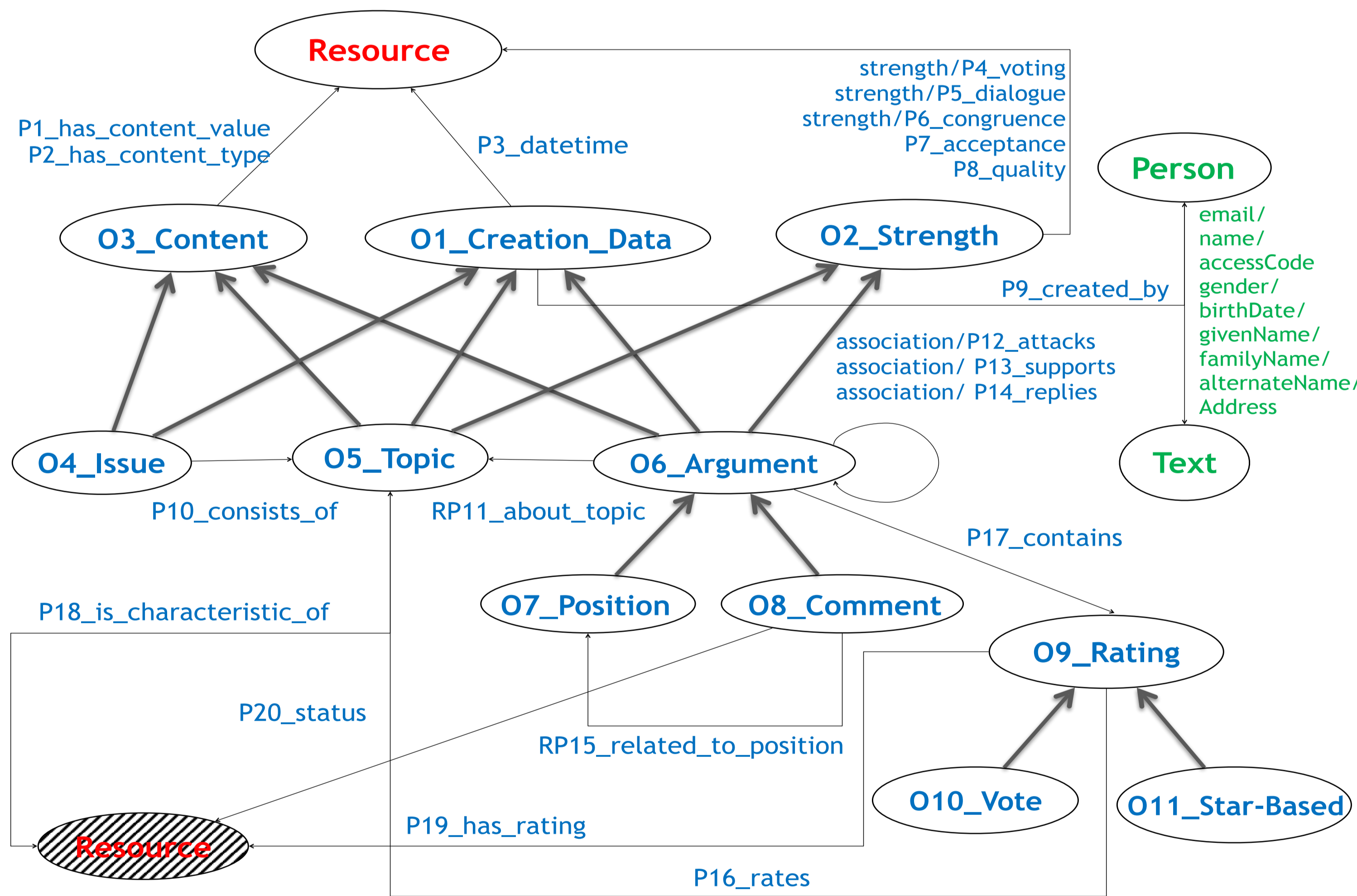


Fig. 2. MACE - ontology domain

3. User Opinion Evaluation

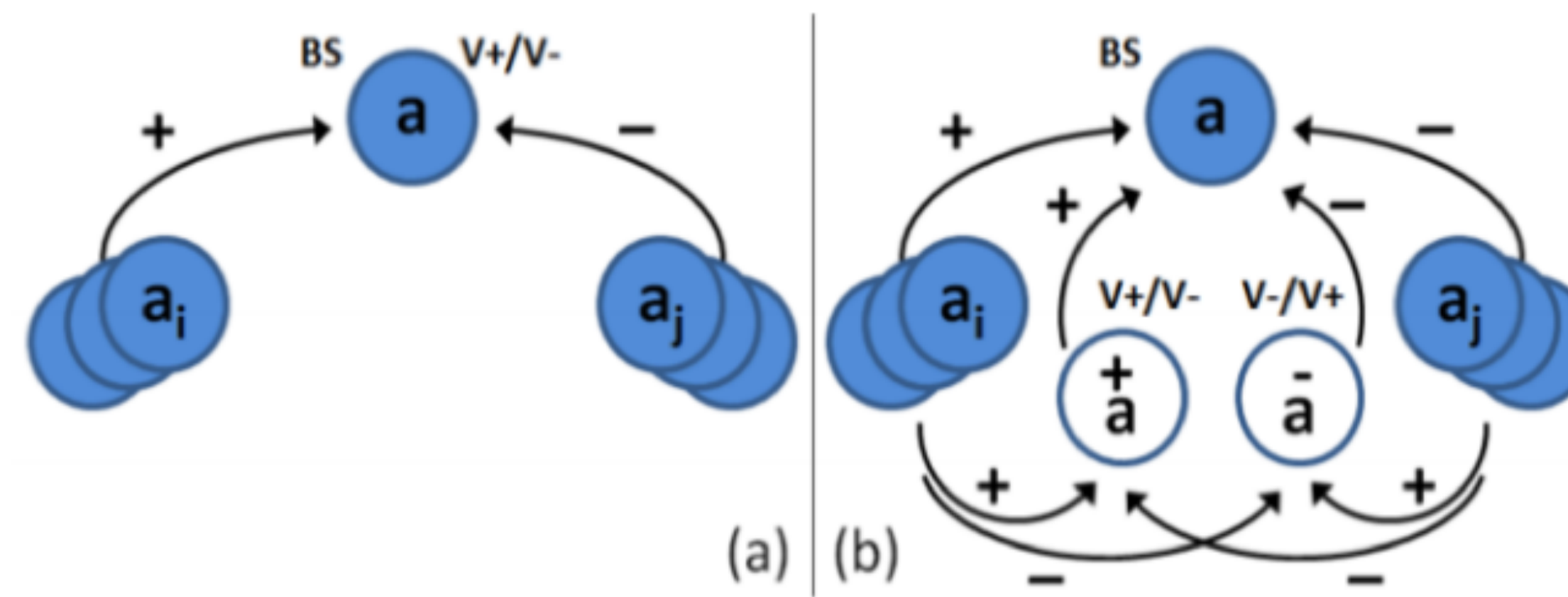


Fig. 3. Argument strength score

We use a multi-dimensional framework (s-mDiCE) for evaluating users' reactions (comments and votes), based on different metrics.

4. Automated Opinion Analysis

We propose an approach for analyzing the user behavior in social communities, where people express their opinions in **support** of or **against** other opinions.

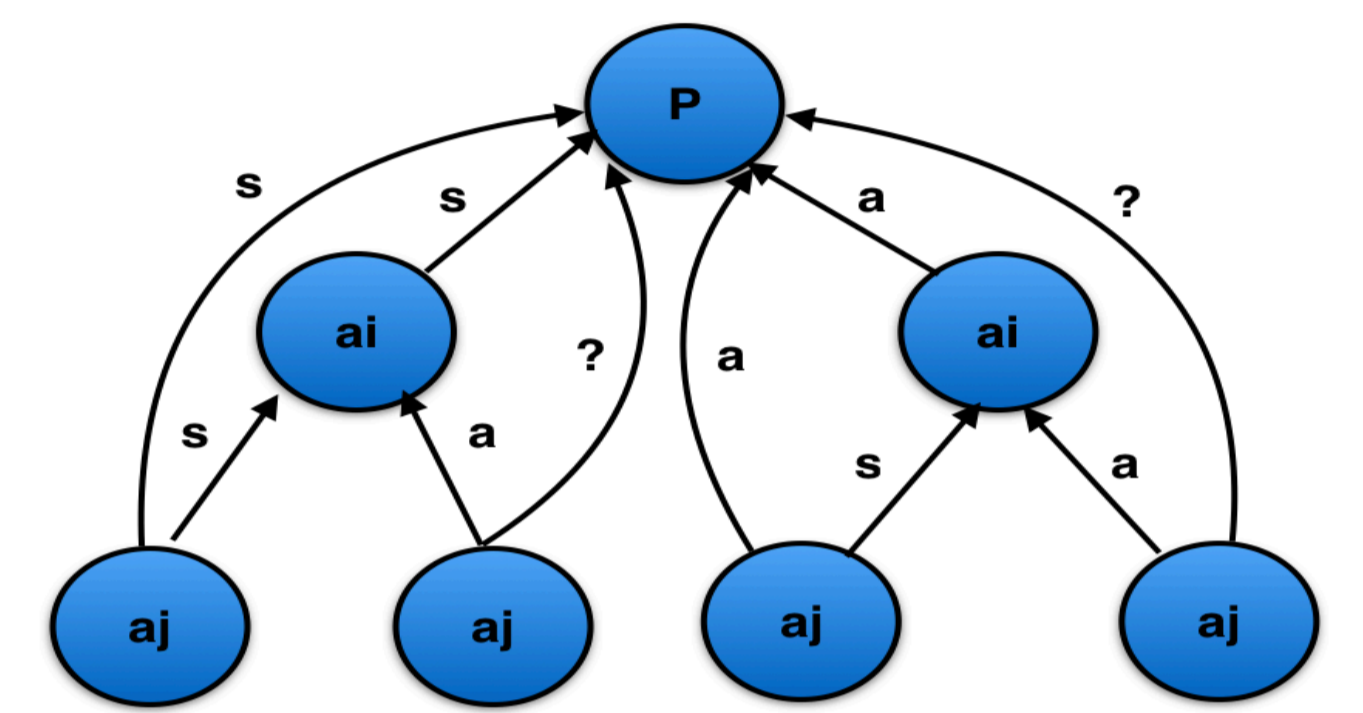


Fig. 4. Argumentation graph

This opinion analysis aims at :

- Identifying useful opinions expressed through the opinion exchange process.
- Discovering interesting relationships among participants and opinions.
- Determining clusters of users who share similar views and profile characteristics.

Towards this aim, we leveraged the following ML algorithms.

Clustering algorithms	Purpose
Expectation-Maximization (EM) algorithm	Decides the optimal number of clusters
K-means algorithm	Identifies different trends of users and opinions
Apriori algorithm	Determines interesting and useful relationships among attributes

5. Future Work

- Visualizing the different clusters (users and viewpoints).
- Evaluating the system with real users and large datasets of discussions.
- Improving the user interface so that can be more usable and intuitive.

References

- J.Schneider, T.Groza, and A.Passant. "A review of argumentation for the social semantic web." Semantic Web 4.2 (2013)..
- T.Patkos, G.Flouris, and A.Bikakis. "Symmetric Multi-Aspect Evaluation of Comments." ECAI 2016-22nd European Conference on AI, (2016).

The platform is available at the following web link:
<http://www.ics.forth.gr/isl/apopsis>

Application Scenario

William • March 30, 2017 at 12:34:2
One of the most important things you can do for the city are the new parks and more green space such as planting trees.
small public plazas parks and green space
Agree (2) Disagree (3) score(0.66)

Brian • March 30, 2017 at 1:8:50
A greener city is a happier and healthier city which means if you push for that empty lot at the end of your street converted into a park you are basically improving your life and the life of everyone around you in ways that will last for years.
Agree (1) Disagree (0) score(0.62)

Oliver • April 6, 2017 at 10:26:40
Adding green space will make the city more livable but only for those who can afford to live there.
Agree (0) Disagree (0) score(0.55)

Debate Analysis Results

Query : Find groups of users whose opinions are close to those expressed by different authors, related to specific debate issue

Issue : How to make a city (Heraklion) more livable ?

The analysis showed that the users { Brian,Kate } share **similar opinions** with the group of users { Isabella,Karmen } and share **disimilar opinions** with the group of users { Matthew,Oliver,Andrew } related to the following positions:

- One of the most important things you can do for the city are the new parks and more green space such as planting trees.
- Arts are extremely important to city living because they are often the manner in which a city expresses its identity.