PARMENIDES: Using Argumentation for Gathering and Analysing Public Opinions Online

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Overview

- Background: argumentation in practical reasoning
- The PARMENIDES system
- Integration with Argumentation Frameworks
- Current extensions
- Concluding remarks

Deliberative Democracy

- Democracy should not simply be a passive process on the part of the public.
- Members of the public should be encouraged to engage in reasoned argument with their representatives and with each other.
- The World Wide Web has facilitated communication and public accessibility to information, though problems still remain in ensuring such communication is effective.
- Thus, the need arises for communication to be clear, unambiguous and structured so as to minimised misunderstandings and misinterpretations.

Practical Reasoning

- Reasoning about the best action to perform in a given situation.
  - What “should” be done.
- Involves the exchange of arguments for and against proposals for action to determine the “best” justification.
- Involves reasoning about facts AND reasoning about choices (“values”).

Theory of Persuasion in Practical Reasoning

- Based on theory of argumentation whereby justifications for actions can be put forward, attacked and defended.
- Manifest in the notion of an argument scheme plus associated critical questions.
- Presumptive justification: *prima facie* justifications of actions presented as instantiations of an appropriate argument scheme, and then critical questions characteristic of the scheme can be posed to challenge these justifications.
- Critical questions subject the arguments to the required scrutiny

Argument Scheme

- AS1:
  - In the current circumstances R,
  - we should perform action A,
  - to bring about new circumstances S,
  - which will realise goal G,
  - which will promote value V.

- This is an extension of Douglas Walton's *sufficient condition scheme for practical reasoning.*

Critical Questions

- All different components of the statement can be questioned:
  - the circumstances, the action, the consequences, the goal and the value,
  - the relationships between these,
  - we identify 16 critical questions, each of which provides the basis for an attack on the argument.
- Each component can be attacked through a denial, a refusal to accept or by proposing an alternative option, giving rise to variants of these attacks.

Example Critical Questions

- CQ1: Are the believed circumstances true?
  - Variants: I am uncertain that they are true, or I believe that they are false.
- CQ2: Assuming the circumstances are acceptable, does the action have the stated consequences?
  - Variants: I'm not sure they do, or I believe they have different consequences.
- CQ6: Are there alternative ways of realising the same goal?
- CQ8: Does doing the action have a side effect which demotes the value?

PARMENIDES

- Implements the previous theory of persuasion in practical reasoning in the form of an online discussion forum (PARMENIDES: (Persuasive ARguMENt In DemocraciES).
- Assumptions: 2 parties are engaged in a dialogue about an action to be performed.
- One party (e.g. the Government) has proposed an action (or course of action) backed up by a justification for carrying this out.
- The other party may respond with agreement or disagreement about the proposed action(s) and give reasons for their stance.

PARMENIDES Overview

- User is guided in a structured fashion through a series of web pages which give a justification of an action.
- User has opportunities to disagree at selected points.
- Each disagreement represents an attack from the general theory of persuasion
- Users may also construct their own opinions on the matter.
- Users' responses are written to a database in order to record what points of the argument are more strongly supported than others.
- Such information provides the proponent of the action (e.g. the Government) with precise information about the nature of the public's disagreement with their policies.

PARMENIDES - Navigation

- The user is first presented with an introductory screen
  - takes some information about the user and explains the purpose and use of the system.
- The following presents a structured statement of the position to be considered, in the form of AS1.
- The user is ask if he accepts the argument
  - if no disagreement is registered he is taken to a farewell screen.

PARMENIDES - Navigation

- Conversely, if the user disagrees with an element of the argument he is lead through a series of forms which give the opportunity to agree or disagree with the following elements, that comprise the initial position:
  - the social values of the position,
  - the promotion of the values by the desired consequences of the proposed action, plus the opportunity to state any additional consequences of the action which he believes compromise the desired value,

PARMENIDES - Navigation

- the consequences of the proposed action,
- the suggestion of alternative actions to realise the desired consequences,
- the description of the current situation, plus the opportunity to state any additional facts he believes to be true and relevant in the current situation.

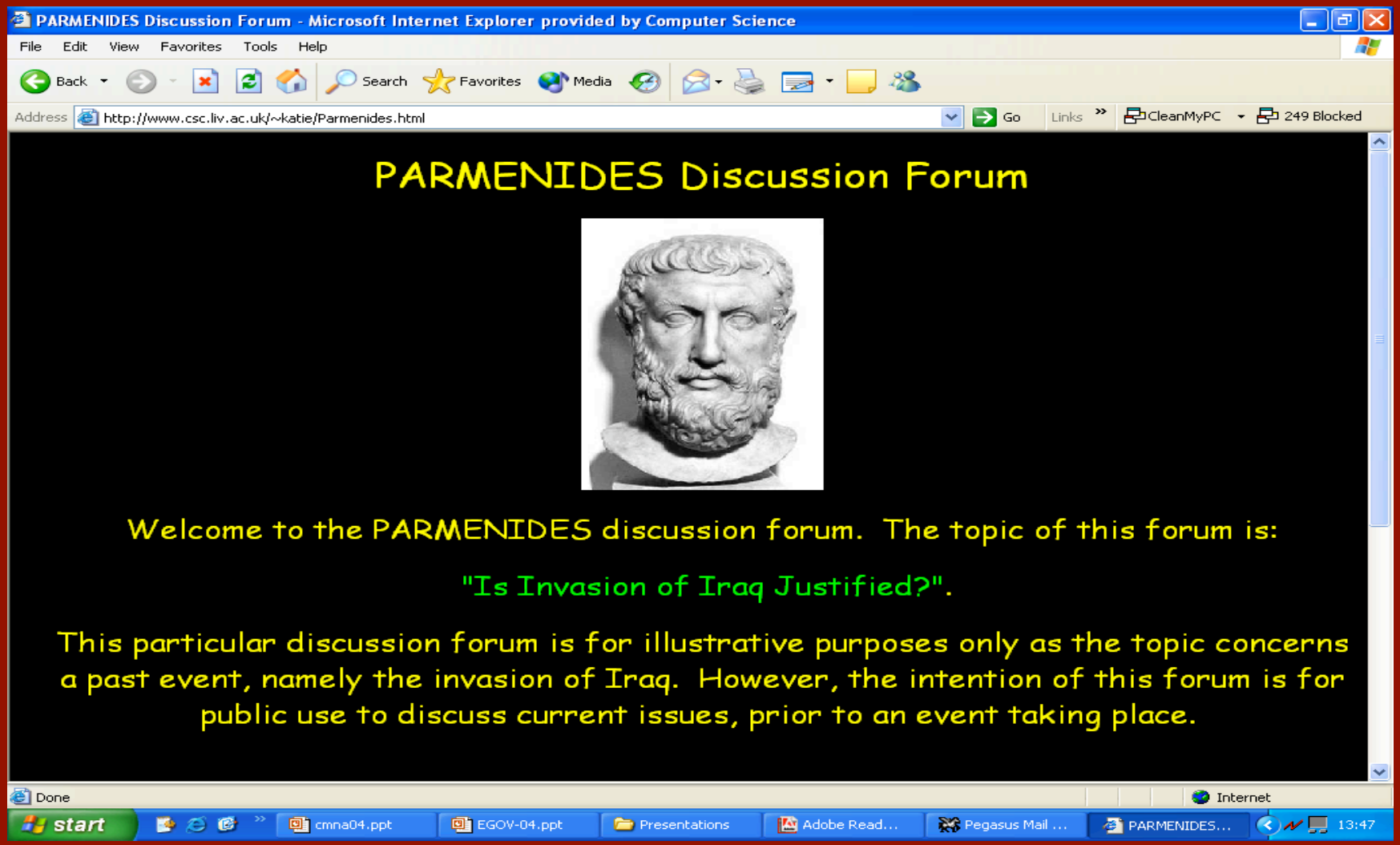
- The user is then taken to a summary screen where he is presented with all the answers he supplied.
- Subsequently, he is invited to either exit the system or construct a new position, comprising each element of the argument scheme AS1, based on his own views.

Prototypical Example

- A prototypical example of the system, which takes the Government's justification of the invasion of Iraq in 2003, can be used at:

- http://www.csc.liv.ac.uk/~katie/Parmenides.html

Prototypical Example – Introductory Screen



Prototypical Example – Stating the Position

PARMENIDES Discussion Forum - Tiscali 10.0

File Edit View Favorites Tools Help

Back Search Favorites Media

Address http://www.csc.liv.ac.uk/~katie/Position.html Go Links CleanMyPC 214 Blocked

We believe it is right to Invade Iraq because:

In the current situation:

Saddam has WMD, Saddam will not disarm voluntarily, Saddam is running an oppressive regime, Saddam is defying the UN, Saddam is a threat to his neighbours.

Invading Iraq will:

Remove the WMD, Restore democracy to Iraq, Assert the authority of the UN, Remove the threat Saddam poses to his neighbours, Cause military casualties, Cause civilian casualties.

This will achieve:

Removing WMD will promote world security, Restoring democracy will promote human rights.

Do you agree with our position? Yes No Submit Form Reset Form

Done Internet

start PARMENIDES Discussi... Microsoft PowerPoint ... EN 15:01

Prototypical Example – Questioning the Values

PARMENIDES Discussion Forum - Microsoft Internet Explorer provided by Computer Science

File Edit View Favorites Tools Help

Back Search Favorites Media

Address http://www.csc.liv.ac.uk/~katie/Values.html Go Links CleanMyPC 249 Blocked

Do you think the following values are worth promoting?

World security: Yes No

Human rights: Yes No

Are there any other values which you think are worth promoting?

Submit Form Reset Form

Done Internet

start cmna04.ppt EGOV-04.ppt Presentations Adobe Read... Pegasus Mail ... PARMENIDES... 13:23

Prototypical Example – Questioning the Purpose

PARMENIDES Discussion Forum - Microsoft Internet Explorer provided by Computer Science

File Edit View Favorites Tools Help

Back Search Favorites Media

Address http://www.csc.liv.ac.uk/~katie/Purpose.html Go Links CleanMyPC 249 Blocked

Do you agree or disagree with the following?

Removing WMD promotes world security: Agree Disagree

Asserting the UN's authority promotes world security: Agree Disagree

Removing Saddam's threat to his neighbours promotes world security: Agree Disagree

Restoring democracy to Iraq promotes human rights: Agree Disagree

Please state any other consequences of invading Iraq which you think would *detract* from:

Done Internet

start cmna04.ppt EGOV-04.ppt Presentations Adobe Read... Pegasus Mail ... PARMENIDES... 13:24

Prototypical Example – Summary of Answers

http://www.csc.liv.ac.uk/~katie/proc_results_f.php - Microsoft Internet Explorer provided by Computer Science

Address http://www.csc.liv.ac.uk/~katie/proc_results_f.php

Thank you for answering all the questions.

Your views on the topic 'Is the Invasion of Iraq Justified?' are summarised below:

Your name is: Katie Atkinson

Do you agree with our position? No

Do you think world security is worth promoting? Yes

Do you think human rights are worth promoting? Yes

Other values you think are worth promoting:

You Disagree that removing WMD promotes world security.

You Agree that asserting the UN's authority promotes world security.

Evaluating the Arguments

- Once a sufficiently large set of arguments have been gathered the Government can then analyse the responses to see which parts of the justification are most/least strongly supported.
- The output of this process is a set of presumptive arguments plus attacks on them.
- It would be desirable at this stage to have some method by which arguments can be compared.
- To this end, we can make use of Argumentation Frameworks, and an extension to them that incorporates the use of values.
  - Enable us to evaluate the comparative merits of the arguments and identify the most justifiable course of action, with respect to different 'audiences'.

Argumentation Frameworks

- To decide which of arguments are acceptable to which users, make use of *Argumentation Frameworks* (Dung ’95), extended to include values (Bench-Capon ’03).
  - Dung ’95 gives an abstract method for evaluating arguments
    - Argumentation framework: a finite set of arguments, and a binary relation between these arguments called an attack.
    - Can be modelled as directed graphs showing which arguments attack one another.
    - Acceptability of arguments is defined in terms of whether they can be defended against attacking arguments.

Value-Based Argumentation Frameworks

- Extend Dung's Framework to associate each argument with a value, which determines whether an attack succeeds in defeating an argument with respect to the value that the argument promotes or demotes.

- Acceptability of arguments depends upon the audience's preference ordering on the values.
  - An argument is defeated for a particular audience if its value is not preferred to that of the attacking argument.

- Distinguishes between objective acceptance (can't choose to reject an argument whatever the value order) and subjective acceptance (acceptability depends on choice of value order).

- Thus allows for rational disagreement, as people may prefer different arguments based upon their value preferences.

Integrating the Approaches - Example

- Original proposal for action (invading Iraq) based on the promotion of two values
  - World security (promoted by getting rid of the WMD)
  - Human rights (promoted through regime change)

- Suppose that a user's responses to Parmenides show disagreement with part of the justification .
  - E.g., he may disagree with the statement "Saddam has WMD", thus he questions the description of the current situation. (CQ1)
  - The user may also go on to offer an alternative action plus justification, for example:

Example

Current situation: we do not know whether Saddam has WMD.
Action to take: give weapons inspectors more time to investigate.
This will: clarify whether the WMD claim is true or not.
This will achieve: public trust in the facts.

- We will call this Arg3 and as this argument offers an alternative action, incompatible with the original action, which promotes some other value, it is posing critical question CQ11.

- There may also be other critiques and counter proposals that make attacks on Arg2…..

Example

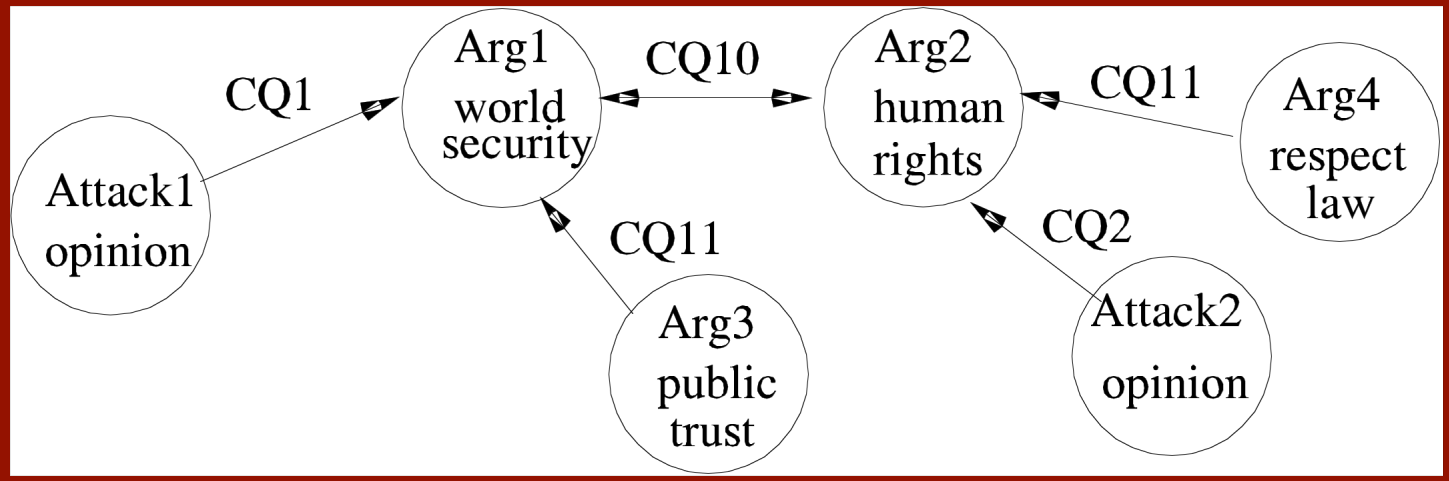
- A critique may be that a particular user believes that invading Iraq will not restore democracy to the country, i.e., he disagrees with the consequences of the action (CQ2).

- A counter proposal, Arg4, again making use of CQ11, may be as follows:

  Current situation: Saddam is running an oppressive regime, Saddam is violating human rights.
  Action to take: wait for a second UN resolution on the matter.
  This will mean: unjustified military intervention is not required.
  This will achieve: respect for international law.

- We can thus instantiate agents with all the above beliefs and add all these attacks and counter proposals to the VAF…

Example



- Of course, user-supplied arguments could also be subject to critical questioning.

- But, if we take this VAF we can evaluate the status of all the arguments involved in the debate, depending on the audiences' value orderings…

Evaluating the Arguments

- The attack of CQ11 on Arg1 would succeed for any audience that ranks the value ‘public trust’ higher than the value ‘world security’.
- Arg4 defeats Arg2 for any audience, that ranks ‘respect for law’ higher than ‘human rights’.
- This leaves Attack1 and Attack2, which would only succeed in defeating Arg1 and Arg2 respectively if they were shown to be an opinion expressed by a sufficiently large number of users.

Current Extensions

- Extensions are currently being made to the system to test it out with a different debate
  - New debate concerns the use of speed cameras on UK roads
- Back-end database is linked to a Java program that performs the following:
  - determines which parts of the argument are most strongly supported from the responses in the database
  - extracts all attacks and counter arguments from the database
  - constructs the VAFs, given the all the arguments
  - asks the user to provide a value ordering
  - determines the justified actions given this value ordering

Concluding Remarks

- PARMENIDES is an electronic discussion forum that is firmly grounded in a model of argument that enables specific disagreements about justifications for actions to be recognised.
- The arguments submitted to the system can be reasoned about using abstract argumentation frameworks.
- The approach encourages public participation and it would allow for the gathering of a wide range of differing views on the topic and the evaluation of the warrant of each view.
- Future work is make the system more generic so that any debate concerning the justification of actions could easily be represented.

Thank you for your attention!

Any questions?

References and Acknowledgements

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