Asynchronous Argumentation System PIRIKA for Anyone, Anytime, Anywhere, with the Balanced Semantics

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Abstract. PIRIKA (an acronym for PIlot for the RIght Knowledge and Argument) is an argument-based communication tool for humans and agents, which supplements and alternates the current communication systems such as Twitter, Line, etc. It allows for asynchronous argumentation for anyone, anytime, anywhere on any issues, as well as synchronous argumentation and stand-alone argumentation. In addition to the Dungean semantics, it also incorporates a recently devised argumentation semantics: the balanced semantics for argumentation based on Heider's socio-psychological balance theory.

Keywords. Asynchronous argumentation, Heider's balance theory, balanced semantics, multiple-valued argumentation, PIRIKA

1. Introduction

In daily life we use various technical tools in order to communicate. But it can hardly be said that these tools help in deliberate and logical communication which is most involved in deep communication such as argumentation. We have developed a new communication tool using argumentation technology. It is an asynchronous argumentation system that allows anybody to argument on any issue at anytime and anywhere. We named it PIRIKA which is an acronym standing for PIlot for the RIght Knowledge and Argument, and we built it with a certain level of usability on the pervasive personal communication tool iPad [1].[2] In addition to the Dungean semantics, it has further been functionally enhanced by incorporating a recently devised argumentation semantics: the balanced semantics for argumentation based on Heider's socio-psychological balance theory [3].

2. PIRIKA system

PIRIKA has the following distinguishing features (see Figure 1 for its look-and-feel):

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[2]The open source software and the video clip of PIRIKA on iPad are available at URL, `http://pirika.cs.ie.niigata-u.ac.jp/pirika_project/index.html`. PIRIKA, is now freely available from the Apple store.

- The underlying logic of PIRIKA: LMA (Logic of Multiple-valued Argumentation) is a generic logic for multiple-valued argumentation constructed on top of the knowledge representation language EALP (Extended Annotated Logic Programming) [4]. EALP allows to represent various epistemologies for propositions in terms of multiple truth values and hence LMA allows to deal with various uncertain arguments under uncertain knowledge bases, and multicultural arguments.
- Indefinite issues such as questions or problems satisfying certain conditions: PIRIKA allows us to put forward indefinite agendas (partially unspecified ones) with variables [2]. These are meant to be agendas such as 'Which things satisfy the condition?', 'To what extent the issue is justified' or 'With how much truthhood the issue is justified', and so on.
- Asynchronous argumentation: Argumentation is usually held in such a synchronous way that participants gather at the same time in the same place. The asynchronous argumentation of PIRIKA solves such a synchronization problem. This aspect is potentially useful since it allows agents and people to make arguments at whim at any time but still in a logically disciplined manner [1].
- The balanced semantics: PIRIKA encompasses diverse semantics such as not only the Dungean semantics but also the balanced semantics based on socio-psychology [3]. The result is displayed using the spring model of graph drawing as in Figure 2.
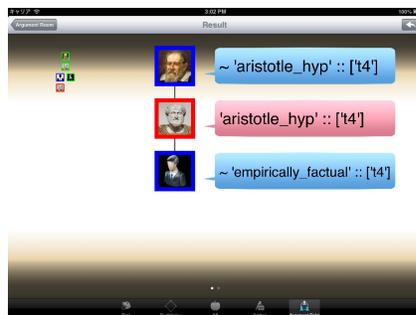

Figure 1. PIRIKA on iPad
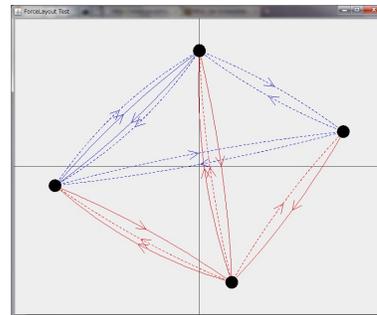
Figure 2. The balanced semantics

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