



ePub^{WU} Institutional Repository

Soheil Human and Golnaz Bidabadi and Vadim Savenkov

Supporting Pluralism by Artificial Intelligence: Conceptualizing Epistemic Disagreements as Digital Artifacts

Conference or Workshop Item (Accepted for Publication)
(Refereed)

Original Citation:

Human, Soheil and Bidabadi, Golnaz and Savenkov, Vadim
(2018)

Supporting Pluralism by Artificial Intelligence: Conceptualizing Epistemic Disagreements as Digital Artifacts.

In: *Philosophy and Theory of Artificial Intelligence 2017*, 04.-05. November, 2017, Leeds, UK.

This version is available at: <https://epub.wu.ac.at/7536/>

Available in ePub^{WU}: April 2020

License: [Creative Commons: Attribution-NonCommercial-ShareAlike 4.0 International \(CC BY-NC-SA 4.0\)](https://creativecommons.org/licenses/by-nc-sa/4.0/)

ePub^{WU}, the institutional repository of the WU Vienna University of Economics and Business, is provided by the University Library and the IT-Services. The aim is to enable open access to the scholarly output of the WU.

This document is the version accepted for publication and — in case of peer review — incorporates referee comments. There are minor differences between this and the publisher version which could however affect a citation.

Supporting Pluralism by Artificial Intelligence: Conceptualizing Epistemic Disagreements as Digital Artifacts

Soheil Human, Golnaz Bidabadi, and Vadim Savenkov

Abstract A crucial concept in philosophy and social sciences, epistemic disagreement, has not yet been adequately reflected in the Web. In this paper, we call for development of intelligent tools dealing with epistemic disagreements on the Web to support pluralism. As a first step, we present POLYPHONY, an ontology for representing and annotating epistemic disagreements.

1 Introduction

While artificial intelligence is considered as both threat and opportunity for the modern democracies, many have called for immediate action for development of AI tools to support pluralism (see e.g. Helbing et al, 2017). Detection, representation and visualization of epistemic disagreements, we propose, is one of the important steps to support pluralism and dialog in the Web. Here are two concrete examples: (I) consider a controversial article in Wikipedia that is the matter of different disagreements. If we would be able to detect and represent disagreements, disputable parts could be visualized for people, users could simply compare different points of view (or request particular versions of the article based on their preferences). (II) Imagine you have recently read an article and like to find some articles that disagree with the proposed point of view. If it would be possible to automatically identify and link disagreeing articles, one could simply find them without the need to exploring all related articles one by one and thoroughly to discover disagreeing contents.

Soheil Human

Department of Philosophy & Cognitive Science Research Platform, University of Vienna, Universitätsring 1, A-1010 Vienna, Austria, e-mail: soheil.human@univie.ac.at
Department of Information Systems & Operations, Vienna University of Economics and Business, Welthandelsplatz 1, A-1020 Vienna, Austria, e-mail: soheil.human@wu.ac.at

Golnaz Bidabadi

Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134, United States, e-mail: golnaz@cisco.com

Vadim Savenkov

Department of Information Systems & Operations, Vienna University of Economics and Business, Welthandelsplatz 1, A-1020 Vienna, Austria, e-mail: vadim.savenkov@wu.ac.at

Due to its nature, Semantic Web and Linked [Open] Data are perfectly fit to capture disagreements: producing two different descriptions of the same phenomenon and publishing them suffices to produce a potential disagreement. What remains to be done is making the disagreement between descriptions co-existing, e.g., at different sources, explicit. This paper advocates a particular instance of the general Linked Open Data (LOD) principle, according to which explicit links between entities and resources are essential. The special type of link, we advocate in this paper, is explicit *disagreement annotations*, making explicit the disagreements using standard LOD linking by means of IRIs. We call the design pattern of providing several alternative descriptions of the same subject its *pluralist description*. This pattern requires either (a) authors of description to be aware of alternative views on the subject, and taking care of encoding these alternative descriptions, or (b) the disagreeing contents are detected, linked and visualized by artificial intelligent agents. Considering the huge and increasing amount of available data, the former option seems to be unrealistic, leaving us no choice but to develop intelligent tools that can perform such tasks. Here, we take the first step towards development of intelligent tools dealing with epistemic disagreements on the Web by conceptualizing epistemic disagreements as digital artifacts and proposing an ontology for representing epistemic disagreements, called POLYPHONY.

2 Conceptualizing Epistemic Disagreements as Digital Artifacts

Study of epistemic disagreements is a fresh and active field of research (Goldman, 2010; Frances, 2014, p.16). Besides the very fundamental questions regarding existence and importance of disagreements, many epistemologists have tried to answer two main questions: (1) What types of disagreement exist? (2) What is the rational response to each type? In order to conceptualize epistemic disagreements as digital artifacts, the answers to these questions should be considered. Therefore, after a literature review, some of the most important types of epistemic disagreements, such as *peer disagreements*, *deep disagreements*, *genuine disagreements*, *merely apparent disagreements*, *merely verbal disagreements*, and *faultless disagreements* (Siegal, 2013; Fogelin, 1985; Cohnitz and Marques, 2014; Jenkins, 2014), along with binary distinctions between them were identified, and real-world examples of each type were documented. Next, possible responses to disagreements, such as (a) *rejecting the existence of the disagreement*, (b) *maintaining one's confidence*, (c) *suspending judgment*, (d) *reducing one's confidence*, and (e) *deferring to the other's conclusion* and the relationship between these responses and different types of epistemic disagreements based on the real-world examples were identified and documented¹.

¹ See the documentations of the POLYPHONY ontology for detailed descriptions, here: <http://purl.org/epistemic-disagreement>.

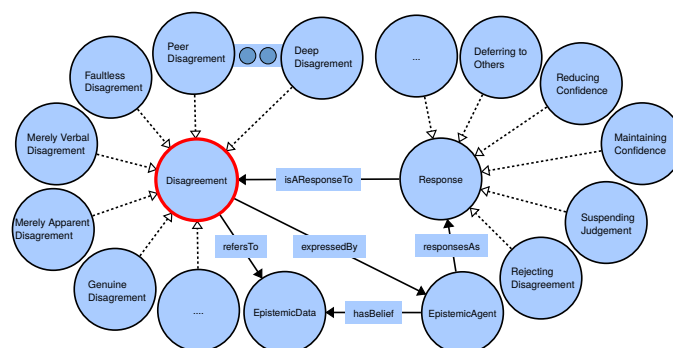


Fig. 1 Core concepts of POLYPHONY ¹

Based on the conceptualization of epistemic disagreements outlined before, we designed, POLYPHONY (see Fig. 1) a generic OWL ontology for annotating disagreements in Linked Data. To this end, POLYPHONY supports disagreement annotations of varying granularity: from the ontology level to the level of single triple, or a collection of triples. As a proof of concept, POLYPHONY was applied to OPENED, a modular ontology for human needs data proposed by Human et al (2017), to represent disagreements between different modules of the OPENED ontology, i.e. to annotate epistemic disagreements between needs theories.

Conclusion — Epistemic disagreement has been argued to be valuable for most crucial aspects of society, such as science (Cruz and Smedt, 2013) and politics. In this paper, we took the first step towards development of intelligent tools dealing with epistemic disagreements on the Web by presenting POLYPHONY, an ontology for representing epistemic disagreements. We hope that our research will serve as a base for future studies on development of intelligence tools for automatic detection, annotation, and visualization of epistemic disagreements on the Web.

References

- Cohnitz D, Marques T (2014) Disagreements. *Erkenntnis* 79(1):1–10
- Cruz HD, Smedt JD (2013) The value of epistemic disagreement in scientific practice. the case of homo floresiensis. *Studies in History and Philosophy of Science Part A* 44(2):169 – 177
- Fogelin R (1985) The logic of deep disagreements. *Informal logic* 7(1):3–11
- Frances B (2014) Disagreement. Polity Press, Cambridge
- Goldman A (2010) Epistemic relativism and reasonable disagreement. *Disagreement* pp 187–215
- Helbing D, Frey BS, Gigerenzer G, Hafen E, Hagner M, Hofstetter Y, van den Hoven J, Zicari RV, Zwitter A (2017) Will democracy survive big data and artificial intelligence. *Scientific American* Feb 25
- Human S, Fahrenbach F, Kragulj F, Savenkov V (2017) Ontology for representing human needs. In: *International Conference on Knowledge Engineering and the Semantic Web*, Springer, pp 195–210
- Jenkins CS (2014) Merely verbal disputes. *Erkenntnis* 79(1):11–30
- Siegal H (2013) Argumentation and the epistemology of disagreement. *OSSA Conference Archive*