

Response to reviewers for the paper:

The Problems of Realism-Based Ontology Design: a Case Study in Creating Definitions for an Application Ontology for Diabetes Camps

James C. Schuler, BSc, PhD student and Werner M. Ceusters, MD

Thursday, 15-Jun-2017

RE: Paper - Student: The Problems of Realism-Based Ontology Design: a Case Study in Creating Definitions for an Application Ontology for Diabetes Camps

Dear Mr. James Schuler:

Thank you for submitting your research to the AMIA 2017 Annual Symposium. We received a record number of submissions this year – over 1,200 across all categories! All submissions were carefully reviewed by expert referees, a Scientific Program Committee (SPC) member, a Vice Chair, and the Chair of the SPC. It is important to emphasize that the SPC faces many difficult decisions to ensure balance of topic areas within the physical constraints of the venue. Given the constraints imposed by the finite meeting duration, need for topic balance, and physical space constraints, a number of otherwise high-quality submissions could not be included this year.

The status of your submission, as determined by the AMIA 2017 SPC and the comments of the reviewers are included below.

AMIA 2017 Decision: Accept

[...]

On behalf of the entire Scientific Program Committee, thank you again for your contribution to the AMIA 2017 Annual Symposium. Please contact Dasha Cohen by e-mail at dasha@amia.org if you have any questions about any aspect of this process.

Sincerely,

Neil Sarkar, PhD, MLIS, FACMI
Brown University
Chair, 2017 Scientific Program Committee

Reviewer Comments (Please note that your submission was reviewed by at least three reviewers and an SPC member. Numbers 1, 2, 3., etc. below represent different reviewers):

Reviewer 1:

REVIEWER: Reviewers found topic of interest but suggest additional work as findings are preliminary and would benefit from additional development and evaluation – perhaps with additional use cases.

AUTHORS: We have provided additional detail in answer to specific requests from the reviewers

Reviewer 2.

REVIEWER: The authors have taken on one of the most complex and largely unresolved challenges in informatics, with high stakes leading up to excellent CDSS and other potential solutions as outcome candidates from this research. Diabetes application, along with other complex medical conditions that I can think of, is fascinating and should continue being under development.

As indicated in the paper, it is still very much a work in progress, and I believe that you should be encouraged to continue, as well as be allowed to speak to the conference audience and present findings to date. I like the quality of the literature review, background research overall, and topic development. Results and discussion are presented in a logical cohesive manner. It is a respectable work that I enjoyed reading and look forward to future publications as well. Good luck!

AUTHORS: we thank this reviewer for his kind words. No specific actions taken in response to this review.

Reviewer 3

REVIEWER: The author introduces a very real issue in ontology construction and address this issue thoughtfully in the introduction. However, I feel as though he/she got distracted from the original intent of the article while explicating the use case.

AUTHORS: we don't see where we got distracted from the original intent of this paper. The intent of the paper was specified in the last paragraph of the introduction: '*In this paper, we demonstrate the sort of problems this [i.e.: the a shortage of adequate mid-level representational resources that follow realism-based principles strictly] introduces for trainees on the basis of a use case: an application ontology for glycemic control of attendees of diabetes camps. We offer some guidelines on how to deal with them in case no ideal solution is available*'. It is exactly this what is covered in the results and discussion section. Of course, the goal of the work which led to this paper is the development of the ontology itself but this ontology itself is NOT the topic of the paper. No action taken.

REVIEWER: Additionally, I would have liked to see a more comprehensive and explanatory methods section laying out a more detailed plan for the suggested ontology. I also feel that the author demonstrates a strong understanding of the domain.

AUTHORS: Such a detailed plan would indeed be a requirement for a paper on the topic of the Diabetes Camp Ontology itself, but, as said before, that was not the topic of the paper submitted. No action taken.

Reviewer 4

REVIEWER: This paper examines the difficulty of building a realism-based ontology for diabetes management in diabetes camps. The paper is well-written and well organized;

AUTHORS: thank you.

REVIEWER: However, the topic is written much more from a philosophy perspective than an informatics perspective, and therefore is unlikely to be of broad interest to the AMIA community.

AUTHORS: On the contrary! We specifically addressed in the introduction the problems of lack of philosophical rigor. To make our point stronger, we provide in the resubmission additional references where this acknowledged through mistakes found by third parties in SNOMED CT.

REVIEWER: Additionally, though the paper brings up some general concepts, they are narrowly focused and of interest mainly to someone trying to build a realism-based ontology, fewer and fewer of whom exist in the informatics community.

AUTHORS: Again, on the contrary! In Christopher Ochs, Yehoshua Perl, James Geller, Sivaram Arabandi, Tania Tudorache, Mark A. Musen. An empirical analysis of ontology reuse in BioPortal. Journal of Biomedical Informatics, Volume 71, July 2017, Pages 165–177, <https://doi.org.gate.lib.buffalo.edu/10.1016/j.jbi.2017.05.021>, it is convincingly demonstrated that realism-based ontologies have become the norm in biomedical informatics and that their terms, specifically of the BFO, are re-used in many domain ontologies. No action taken.

REVIEWER: The end of the 2nd paragraph of the introduction "...hard for trainees without a solid education in philosophy" encapsulates my issues with the paper- I don't see it of interest to people who are looking at ontologies from a practical, rather than philosophical, viewpoint.

AUTHORS: Why it is of interest to people who are looking at ontologies from a practical, rather than philosophical, viewpoint, was nevertheless explained in the paragraphs immediately following that assertion. No action taken.

REVIEWER: The authors do not support the premise or necessity of using the realism-based approach. I would argue that most developers would just use a different approach or an existing vocabulary like SNOMED CT to solve most of the problems described in the paper. The authors need to make a stronger case as to why Making "realism-based ontology development more accessible" is important.

AUTHORS: With the detrimental consequences that have been described in so many papers. We have added references to this effect.

REVIEWER: In the methods section , the authors describe their approach to developing a "small custom-made ontology-based EMR," but don't explain why this necessitates a realism-based ontology.

AUTHORS: Once again, the reasons are explained in the third paragraph of the introduction. We reformulated it to make it clearer.

REVIEWER: How is creating yet another way to represent data about diabetes, even if it's unique in terms of being about diabetes camps, add to general knowledge? The discussion notes that a new ontology is needed, but the reasoning, that only a few have the right terms and relations, and rarely follow realism-based guidelines, is not sufficient to make the case.

AUTHOR: yes it is, for the very same reasons as stated above.

REVIEWER: The rest of the discussion shows some interesting instances, but describes typical steps one takes in developing an ontology that have been well-described elsewhere.

AUTHOR: What is not elsewhere described, are the problems one may encounter in following these steps. That is precisely the point of this paper.

REVIEWER: Overall, the paper is well-written but from a perspective (philosophy) that does not reach the level of importance to make it interesting to a general informatics audience.

AUTHOR: the paper was submitted to a biomedical informatics conference. As argued for and demonstrated above, realism-based ontology development IS almost mainstream, yet many mistakes are being made.

Reviewer 5:

REVIEWER: This article describes the importance and difficulty of ontology for reality. Actually, it IS difficult, because there is no quantitative metrics to evaluate ontology with the reality.

AUTHORS: that is not correct. See for instance Ceusters W. Towards A Realism-Based Metric for Quality Assurance in Ontology Matching. In: Bennett B, Fellbaum C. (eds.) Formal Ontology in Information Systems, IOS Press, Amsterdam, 2006;:321-332. Proceedings of FOIS-2006, Baltimore, Maryland, November 9-11, 2006; Ceusters W, Smith B. A Realism-Based Approach to the Evolution of Biomedical Ontologies. Proceedings of AMIA 2006, Washington DC, 2006;:121-125. However, the methodology proposed there is to be applied AFTER the facts. The topic of this paper is principles to PREVENT mistakes.

REVIEWER: The authors figured such challenge for ontology of diabetic camp for the instance of such ontology and showed the difficulty of developing ontology in details, but the evaluation should be more objective.

AUTHORS: The topic of the paper was not a presentation of the ontology and an objective evaluation of it, but rather throwing light on problems that occur while designing it.