Measurable Epistemological Computational Distances in Medical Guidelines

Peer Disagreement

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Abstract:

The study of the epistemological dimension of medical guidelines disagreement requires a social epistemology of disagreement treatment, with a special attention to peer disagreement problems. In addition, given the great magnitude of data and information in said guidelines, there is an additional systematic need for a cognitive extension in our ability to reliably consider simultaneously and contrastively these guidelines against each other under peer disagreement. In order to fill this gap, we propose an innovative computational epistemology of disagreement platform for the study of epistemic peer evaluations of medical guidelines. The main epistemic goal of this platform is to analyze and refine models of epistemic peer disagreement with the use of greater computational power. We suggest to measure the conceptual distances between guidelines with natural language processing tools and topological analysis to add modeling precision to the characterization of epistemic peer disagreement in medicine.

In order to develop this platform, we study the breast cancer screening medical guidelines disagreement CDC) as a test case. We provide a model theoretic treatment of propositions of breast cancer guidelines under disagreement, and investigate the conceptual distances between them, with the support of natural language processing techniques. Guidelines terms partial agreements and disagreements are mapped in reference to inter-medical domains in breast cancer screening. The main epistemic hypothesis in this study is that medical guidelines disagreement translated into epistemic peers positions, may represent a Galilean idealization type of model thereof, which gets in the way of better understanding the peculiarities of medical guidelines disagreements. A second corollary hypothesis is that a new near-peer expert epistemic agency classification may be required as a result. We also generate a topological analysis of contradictions and disagreement with sheaves, while taking in consideration conceptual distance measures (Zadrozny & Garbayo, 2018).

The issue of medical guidelines disagreement, besides the epistemological dimension, has admittedly a more important practical dimension, associated with the need of augmenting medical decision-making. This raises the question of how should this practice be reflected in building consensus. Finnur Dellsén (2018) When Expert Disagreement Supports the Consensus - argues that "non-experts (should) trust that the experts really are justified in their attitudes towards consensus theories". We show in our two previous paper (Sheaves, 2018 and IWCS, 2017) and in the present paper that we can obtain a more fine grained analyses of disagreement than on the proposition/sentence level. Furthermore some of this analyses could, at least in principle, be supported by computational tools, and model agreements in support of medical decision-making. In particular, in medical guidelines disagreements there could be identified multiple consensus theories for some subsets, and possibly no explicitly articulated consensus.

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