

Generic semantic relatedness measure for biomedical ontologies

João D. Ferreira and Francisco M. Couto

Departamento de Informática
Faculdade de Ciências da Universidade de Lisboa
Campo Grande, Lisboa, Portugal

Abstract. This paper presents a new method to measure semantic relatedness between concepts of an ontology with a rich set of relationship types, and performs a preliminary assessment of its validity. The measure was designed to be applicable to all biomedical ontologies, and to be flexible enough as to allow for different applications to address their own requirements by tuning, for example, the weight of each relationship type. We focus on the fact that we measure relatedness instead of similarity, which measures not simple likeness between concepts but also other interactions like articulation of cartilage and bones.

We applied the measure to the Foundational Model of Anatomy, an ontology of human anatomy, and showed that it can be used to differentiate between related pairs of anatomical concepts and unrelated ones with higher performance than a custom similarity measure would.

This work has shown positive preliminary analysis of the generic measure developed, which is a step forward to implementing tools to process the information contained in the increasing amount of biomedical ontologies.

Keywords: Semantic similarity and relatedness, Biomedical ontology applications, Relationship types, FMA