

## BUILDING A BILINGUAL BIO-ONTOLOGY PLATFORM FOR KNOWLEDGE DISCOVERY

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Received July 2010; revised November 2010

**ABSTRACT.** *Bio-informatics or Bio-medicine is a hot area where biological ontologies are developed for reasoning and knowledge sharing. However, biomedicine is an evolving field (new knowledge emerges from research, etc.); therefore, a standard ontology construction process is required to keep the ontology up-to-date. This paper proposes to deal with the construction of a specialized ontology as the discovery of a new knowledge structure. The proposed bilingual bio-ontology contains more than 250 concepts about physiology, function and structure of human digestive system. Hence, the paper proposes a methodology for building a bilingual (English/Arabic) ontology for the digestive system in the biology domain. In conclusion, this paper presents a first step towards the creation of a bilingual bio-ontology through the integration of its sub-ontologies.*

**Keywords:** Ontology, Biomedical ontology, Manual evaluation, Bilingual, Knowledge discovery

**1. Introduction.** Ontology generally is used to describe some domain or do reasoning on that domain. The knowledge about the domain is often represented in a semantic network which contains concepts and their relationships [36]. Ontologies have been used by researchers in diverse areas because it gives meaning/context to the data and facilitates knowledge sharing. Bio-informatics or bio-medicine area is one area among such areas where biological ontologies are developed for reasoning and knowledge sharing. However, biomedicine is an evolving field (new knowledge emerges from research, etc.); therefore, a standard ontology construction process is required to keep the ontology up-to-date [5]. In the last two decades, researchers have applied information technology techniques to the field of biology to study, store and analyze different biological effects. With the boom in bio-informatics, researchers have proposed many efficient frameworks/techniques for creating or to do reasoning on biological ontologies.

Ontology Engineering is a relatively new research area and a standard theory does not exist for ontology construction [5]. Because of the lack of standard theory, ontology designing requires many manual steps [37] and usually ontology contains concepts, semantic network or hierarchical structure (i.e., relations such as is-a and part-of) and axioms [17]. To date, various methods have been developed and introduced to build ontology in various disciplines such as On-To-Knowledge [22], METHONTOLOGY [38], Uschold and King's [14] and Cyc approach [35]. However, these methods focus on either building the ontology