

# The ROMULUS resource for using foundational ontologies

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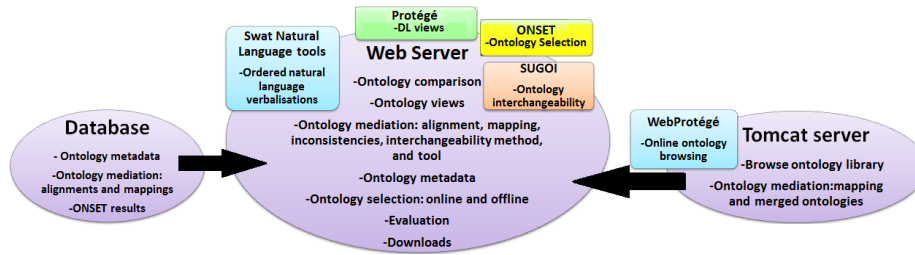
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Foundational ontologies (FOs) provide general entities that aid in ontology development to facilitate modelling, improve interoperability among domain ontologies, and they have been shown [2] to improve the quality of domain ontologies. There are several hurdles to their uptake, however, including *(i)* ontology developers face great difficulty understanding the FOs philosophical notions and entities, *(ii)* there are various views among ontology developers about how these general entities are defined and their philosophical assumptions, hence there are many FOs, yet one needs to be chosen for ontology development, *(iii)* though chosen to use one foundational ontology, one still may want to link to another to foster ontology interoperability, and *(iv)* some FOs are highly axiomatised such that it negatively impacts any possible scalable ontology-driven application. To solve the first two problems, we have developed the ONTology Selection and Explanation Tool ONSET [5]. The Software Used to Gain Ontology Interoperability, SUGOI, can automatically ‘swap’ between DOLCE, BFO, and GFO-aligned OWL ontologies [6], solving the third issue. For the latter, we have developed the Repository for Ontologies of MULTiple USEs, ROMULUS [4] [[www.thezfiles.co.za/ROMULUS/](http://www.thezfiles.co.za/ROMULUS/)], which also gives access to SUGOI and ONSET.

**ROMULUS’s components** ROMULUS is an online repository for FOs aimed at improving semantic interoperability and giving the public access to tools and features to assist with FO usage. Besides typical ontology repository features, it has a set of machine-processable, modularised, and interchangeable FOs in OWL. Its features and components are presented in Fig. 1, which aid FO mediation, interchangeability, selection, browsing, understanding, and usage. Besides ONSET and SUGOI, one can access FO mediation data (alignments and mappings) between FOs, and metadata of its ontologies, which are stored in a searchable database. It also links with other tools, such as SWAT Natural Language tools [9], WebProtégé [10], and the OWL files are shared with OntoHub [8].

**ONSET** recommends an appropriate FO to an ontology developer, based upon the developer’s requirements. The recommendation is based on criteria that different FOs satisfy and an optional weighting of categories of criteria set by the ontology developer. ONSET then computes the most suitable FO; if the user’s selected criteria matches more than one FO, then these conflicting results are displayed and explained. ONSET is available as a jar file and integrated with ROMULUS.



**Fig. 1.** The interaction and features of ROMULUS's components.

**SUGOI** allows the user to load their domain ontology that is linked to either DOLCE [7], BFO [<http://www.ifomis.org/bfo/>], or a GFO [1] FO module, and automatically interchange it between the three, so that one can 'offer' one's ontology to different groups of users. It is based on extensive work on FO alignment [3] and its OWL mapping files and a novel algorithm to swap FOs [6].

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