

Common Logic Ontology Repository

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Motivation

- One obstacle to the development of expressive formal ontologies for manufacturing domains has been the lack of an adequate set of generic ontologies that can be used to specify the semantics of primitive concepts.
- For example, any product ontology must refer to relationships from geometry and topology, and different manufacturing standards may require different ontologies for time.

Identify existing ontologies within the research community that will be able to provide these foundations for manufacturing ontologies, and then to integrate these ontologies with the semantics for the terminology of the manufacturing standards.

Research Programme

- Construct a repository of first-order ontologies that will serve as a testbed for ontology evaluation and integration techniques, and that can support the design, evaluation, and application of ontologies in first-order logic.
- All ontologies will be specified using Common Logic (ISO 24707).

Organization of the Repository

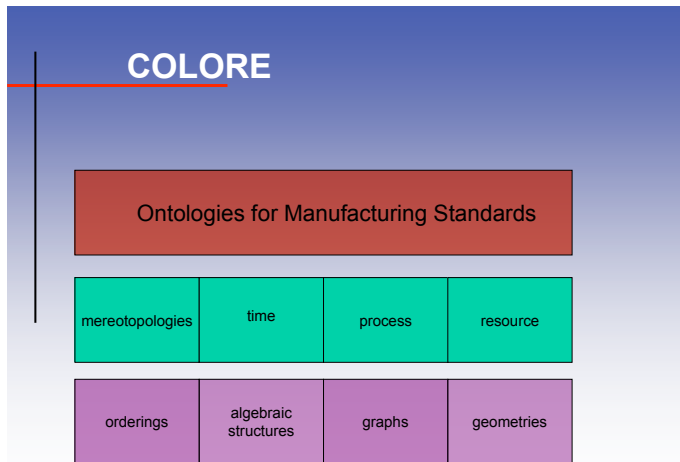


Figure: COLORE

Applications

- We can use the relationships among ontologies within the repository to guide the axiomatization of new ontologies and to propose semantic mappings between ontologies.

Can COLORE be incorporated into BioPortal?

- The underlying representation for ontologies in BioPortal is OKBC, which restricts relations to be unary or binary.
- Relationships between Common Logic ontologies are “module-centric” rather than “relation-centric”.

Common Logic Ontologies

- Common Logic ontologies are sets of `cl:modules`, which in turn are sets of Common Logic sentences.
- The `cl:imports` relation specifies other modules whose axioms must also be used in conjunction with the axioms of a particular module.

Challenges

- Can we represent the relations by reification and rely on the visualization of the ontologies in BioPortal to “render” them in a natural way?
- Extend the ontology metadata in BioPortal to represent the metatheoretic relationships between Common Logic modules.