Logik für Informatiker
Logic for computer scientists

Ontologies

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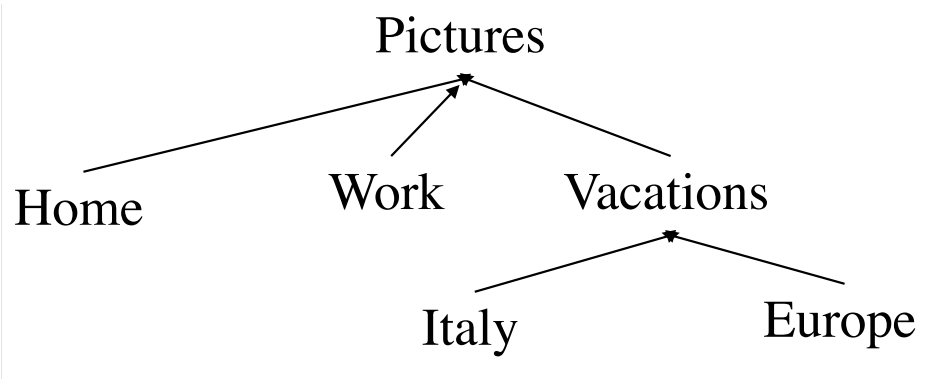
Ontologies

- Ontology in philosophy:
  philosophical study of the nature of being
- ontology in computer science:
  - conceptualisation of a domain
  - hierarchical taxonomy
  - explaining relations between concepts
  - shared within one or among several communities
  - applications
    - classification: knowledge representation and organization
    - application: information storing, sharing, retrieval and reuse

Ontologies versus mere Classifications

This is not an ontology:



Upper ontologies and domain ontologies

- Upper ontology: very general and abstract concepts
  - e.g. DOLCE, BFO, SUMO, Cyc, ...
- Domain ontology: precise description of concepts from a small domain
  - e.g. Snowmed, NCI, GALEN, JRAO (medicine, anatomy, drugs), Dublin Core (documents and publishing), GUM (linguistics)
- both are complementary
- level in between: Core ontologies

An upper ontology: DOLCE

Descriptive Ontology for Linguistic and Cognitive Engineering

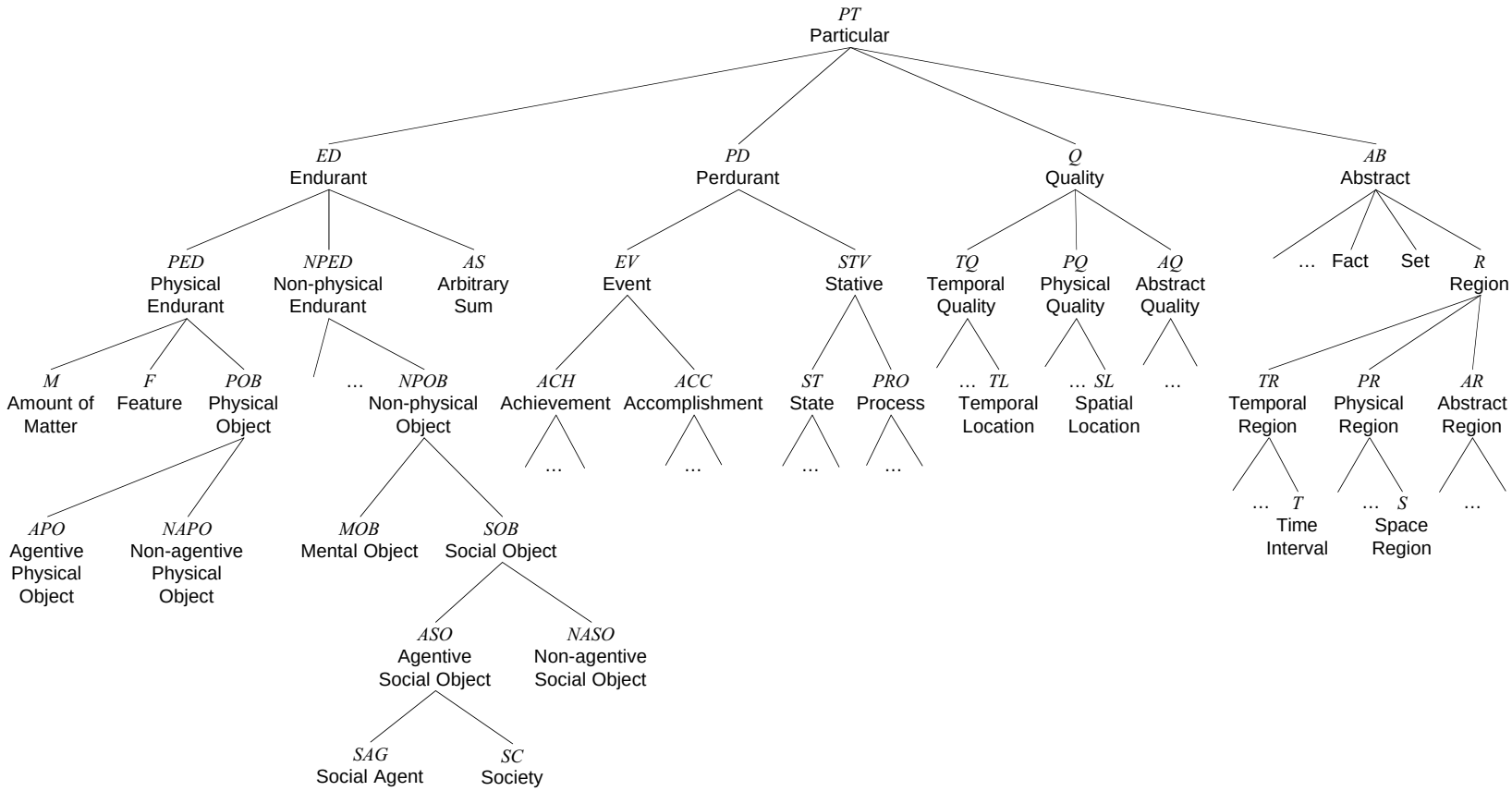
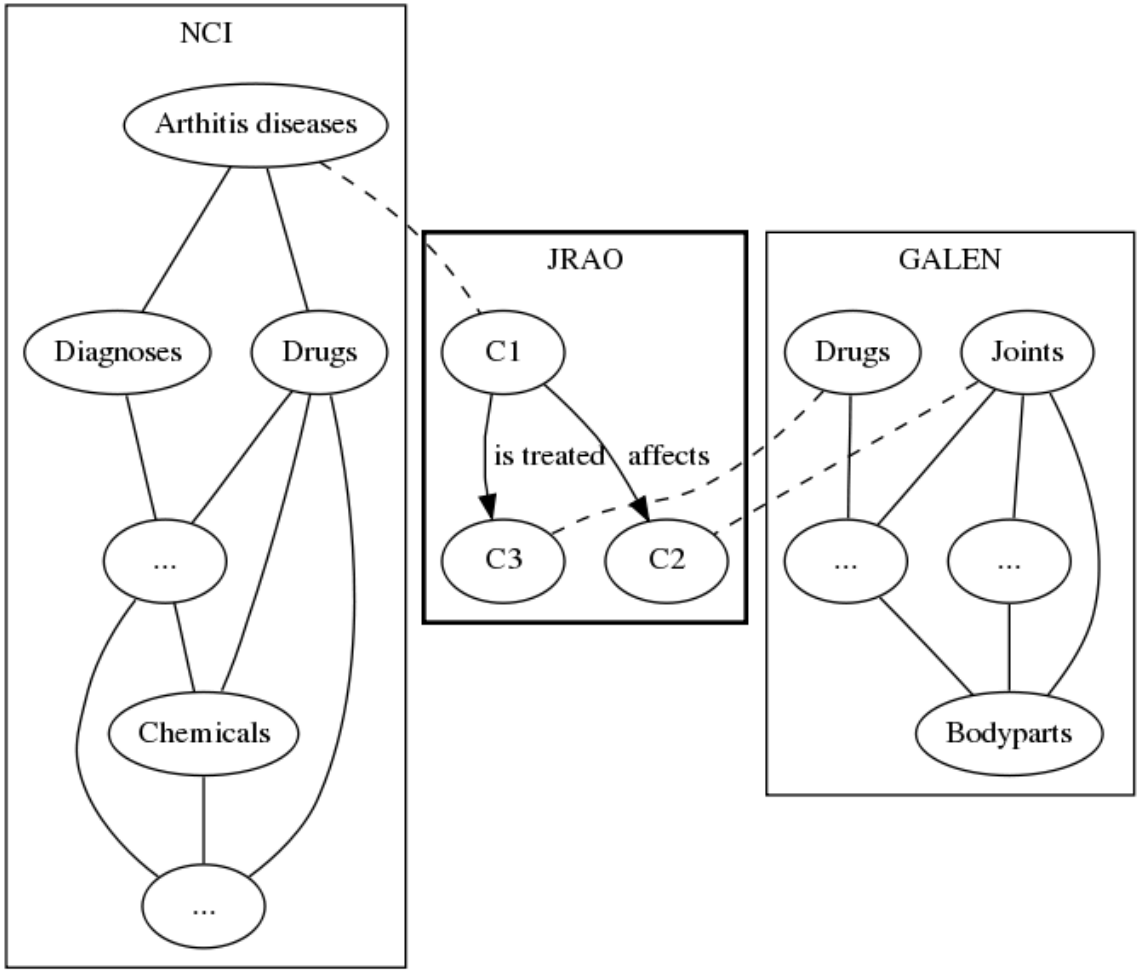


Figure 2: Taxonomy of DOLCE basic categories.

Domain ontologies: NCI, GALEN, JRAO



Applications: semantic web

- Wikipedia has many lists, like "List of metropolitan areas in Spain by population"
- Semantic web technology can generate these automatically
- Semantic Mediawiki

Ontology languages

- description logics (efficiently decidable fragments of first-order logic)
  - Web Ontology Language OWL
- first-order logics
  - Knowledge Interchage Format (KIF), Common Logic (CL): untyped
  - Common Algebraic Specification Language (CASL): typed