

CS 690-009 Week 3

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An Introduction to Description Logics

Previous Representations of Knowledge	Description Logics
<p data-bbox="338 621 995 1011">Network-based (cognitive) structures such as semantic networks and frame systems very effective, practical, and human-centered but are not consistent (apparently identical systems behave differently)</p> <p data-bbox="338 1081 1010 1352">Logic-based systems (variants of first-order predicate calculus) are general purpose by nature but not as practical or human-centered as cognitive approaches</p>	<p data-bbox="1052 621 1787 837">Hierarchical network (terminology) of concepts (defining sets of individuals) related by an underlying logical system.</p> <p data-bbox="1052 907 1787 1179">Underlying logic does not necessarily need to be as complex as first-order logic, allowing for more practicality by not requiring first-order logic theorem provers.</p>

An Introduction to Description Logics

TBox (Intensional Knowledge)

Woman \equiv Person \cap Female

ABox (Extensional Knowledge)

Woman(ANNA)

Implied:

Person(ANNA)

Female(ANNA)

An Introduction to Description Logics

- Used used in application areas such as Natural Language Processing, Software Engineering, Medicine, and Web-Based Information Systems, Planning, and Data Mining
- Some problems with DL's might be high worst-case complexity, although there have been significant improvements in algorithms since the writing of this book, and empirical tests have shown that the worst-case rarely occurs in practice