

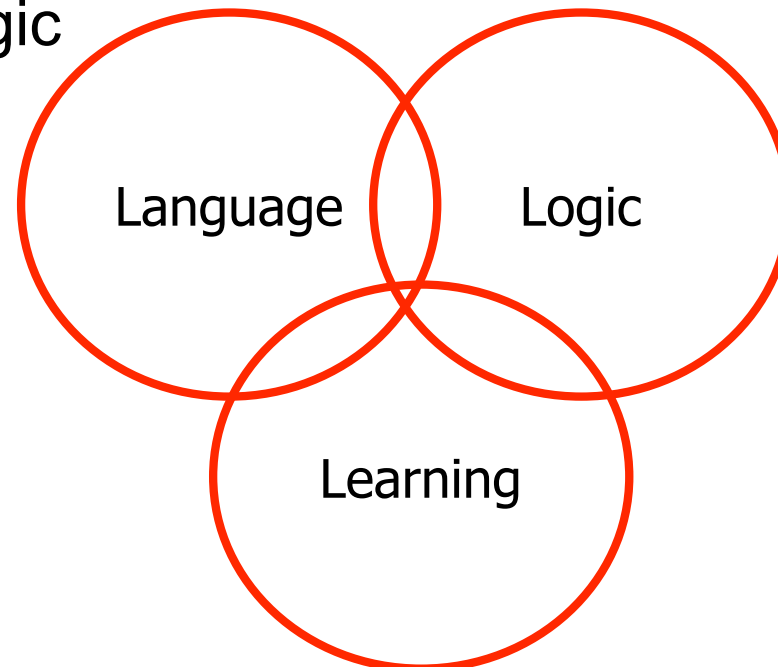


Logic, Language and Learning

Conclusions

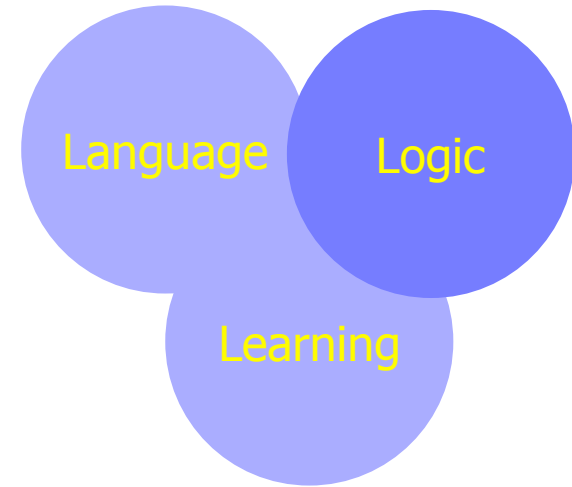
Luc De Raedt

-
- Logic
 - Computational logic
 - Language
 - Natural language processing
 - Learning
 - Machine learning



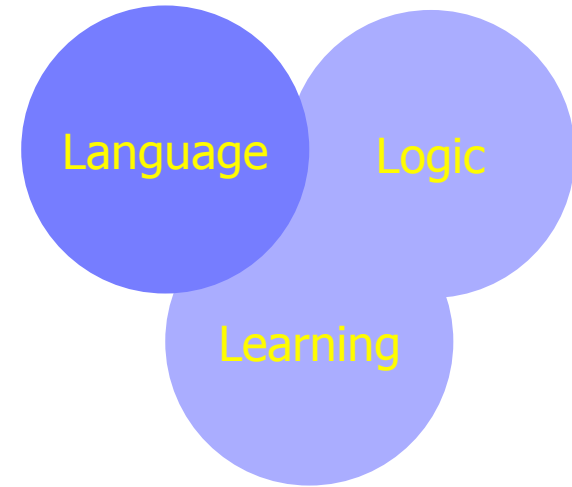
Logic

- Computational logic
- Programming language
Prolog as a tool for studying
computational logic



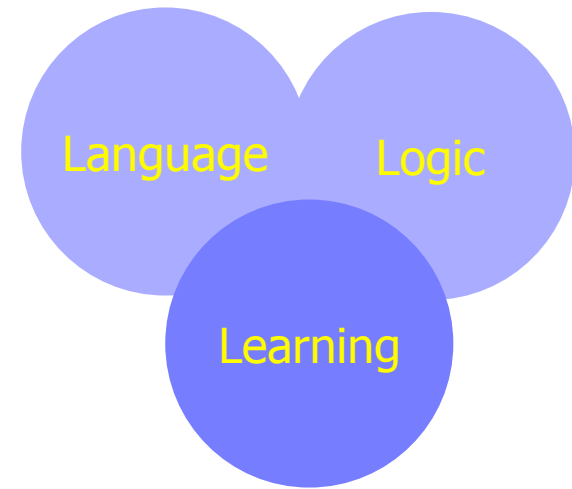
Language

- Natural language processing
- Focus on Computer Science perspective
- Building systems that understand Nat. Lang.
- Linguistic aspects important too !



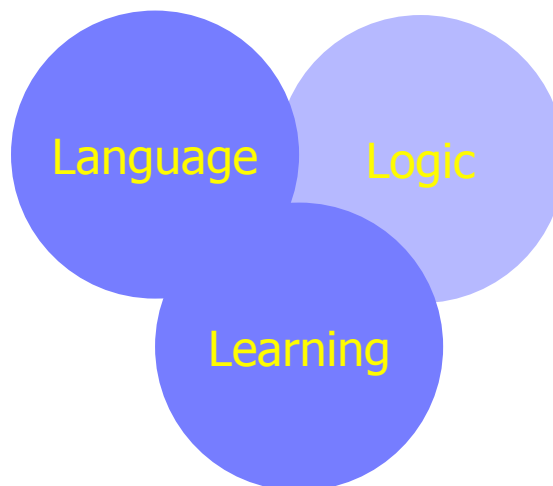
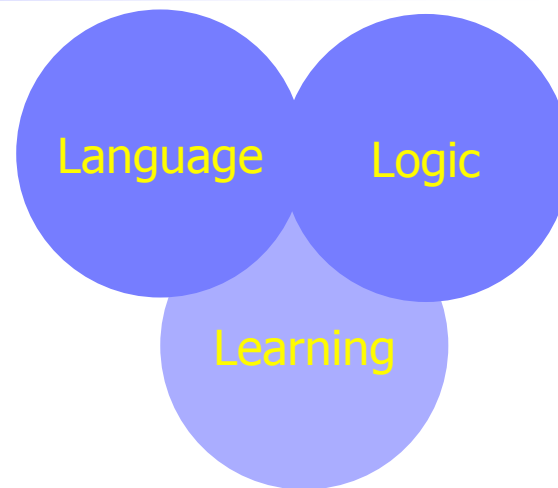
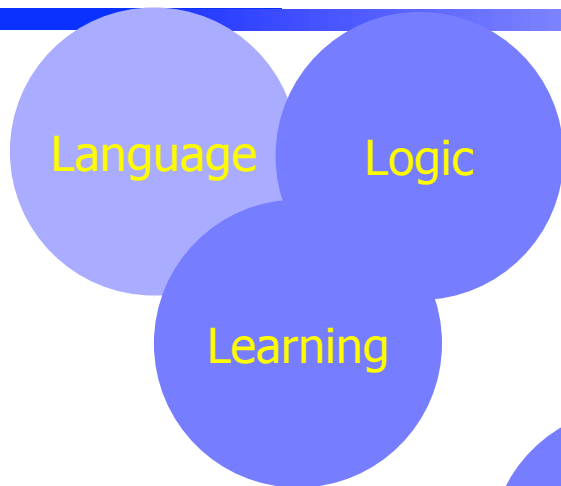
Learning

- Machine learning
- Aims at improving one's performance on a specific task with experience
- Often related to use of data, data analysis and data mining



Inductive Logic Programming

Unification Based Grammars/DCGs



Empirical/Statistical Natural Language Processing

Inductive logic programming

- The study of (inductive) machine learning and data mining using computational logic
- Why ?
 - The need for an expressive representation language
 - Usual learning/mining techniques employ flat table
 - Logical aspects of learning
 - Induction/generalization and Deduction/Specialization

Language and Logic

- Many implementations of NLP systems employ computational logic
 - Prolog
 - Unification based grammars
 - Example : Definite clause grammars

Natural language processing

- Using grammar formalisms
- Close correspondence between certain types of grammars and logic programs
- Also, many popular grammar formalisms are *unification* based

Learning and Language

- Classical Approach
 - Writing grammars and lexicon by hand
 - Very labour intensive
 - Not so easy to reuse results from one domain to the next
 - Deep parsing
- Empirical/Statistical NLP
 - Start from so-called corpora (data)
 - Derive or optimize (possibly parts of) grammar lexicon using ML/Stats Methods
 - Shallow parsing
 - Often using HMMs, n-grams, PCFGs, ...
 - See course on Advanced AI Techniques in WS
 - Seminar/Praktikum on Probabilistic Logic Learning in WS

Chapter 7

- To know :
 - 7.1,7.2,7.3, 7,4 (but not its subsections),
 - 7.6,7.9