Why Build Natural Language Grammars by Hand?

- Research
  Develop and test precise hypotheses about language

- Education
  Teach formal methods and linguistic theory

- Applications
  Provide better language-processing technology
Using grammar implementations for research

• Help to formalize linguistic theories
  Precisely describe large collections of grammatical rules
  Test complex interactions among natural language phenomena
  Identify cross-linguistic generalizations

• Evaluate candidate NLP tools and techniques
  Test for efficiency, usability, generality

• Provide training data for statistical methods for NLP
  Build hand-annotated treebanks of string/analysis pairs
  Bootstrap automatic annotation of large corpora
Using grammar implementations for education

• Teach frameworks or analyses in formal morphology, syntax, and semantics
• Support experimentation by students, for practice or to explore alternatives
• Improve language learning with more flexible dialogues
Using grammar implementations for applications

- Machine translation
- Information extraction, retrieval
  - From the web (mostly unstructured data)
  - From databases (structured data)
- Email auto-response
- Speech prosthesis for physically disabled people
- Speech recognition
- Precise classification of text
- Summarization of text
‘Deep’ grammars can provide semantic precision

- Composition of meaning from words and phrases
  Grammars encode linguistically motivated analyses
  Syntax-semantics interface is explicitly defined
  Lexical entries can reflect idiosyncratic properties

- Spurious results can be avoided
  Grammars distinguish well-formed from ill-formed input
  Fine-grained distinctions interact well with general principles
  One grammar can serve both for parsing and for generation