

Natural Language Interfaces (NLIs)

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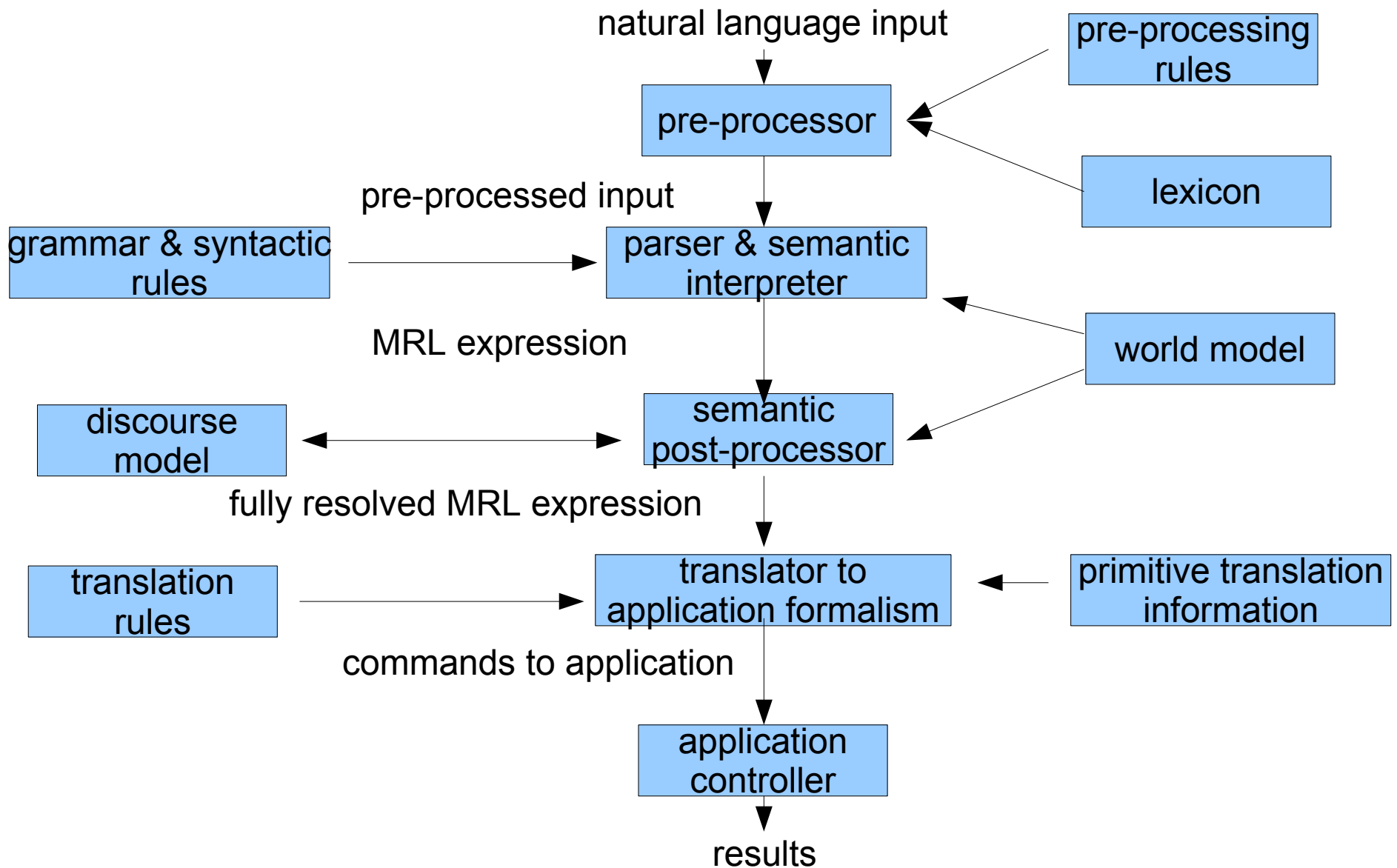
Natural Language Interaction Systems

- Requests addressed to computer in NL
 - written -> Natural Language Interfaces (NLIs)
 - spoken -> Spoken Dialogue Systems (SDSs)

Natural Language Interfaces

- Used in/for
 - database querying
 - robot control
 - virtual reality systems
 - expert systems
 - information retrieval from text
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NLI System Architecture

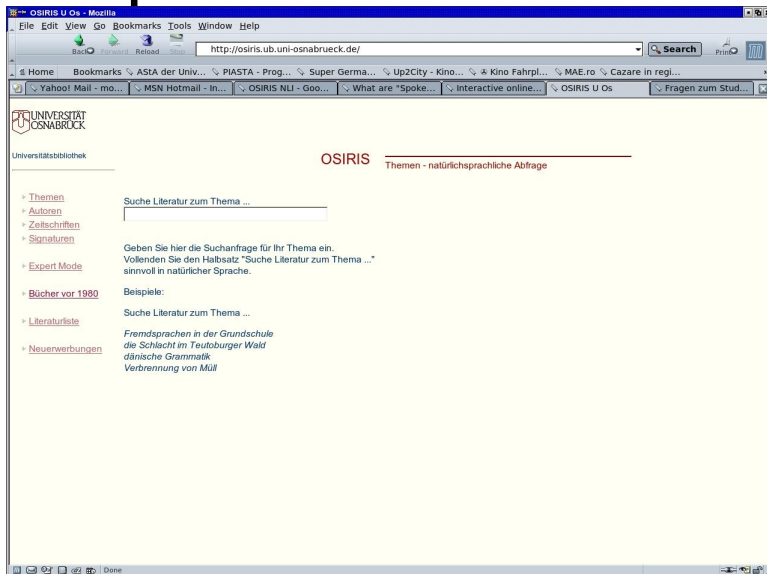


Other components

- Paraphraser
- Response generator
- Portability tools

Examples

- OSIRIS (<http://osiris.ub.uni-osnabrueck.de/>):
Osnabrück Intelligent Research Information System, NLI targeting a single dedicated database (library)
- LUIS (<http://www.ifi.unizh.ch/CL/UIS/LUIS/>)
– questions about studies in the University of Zürich



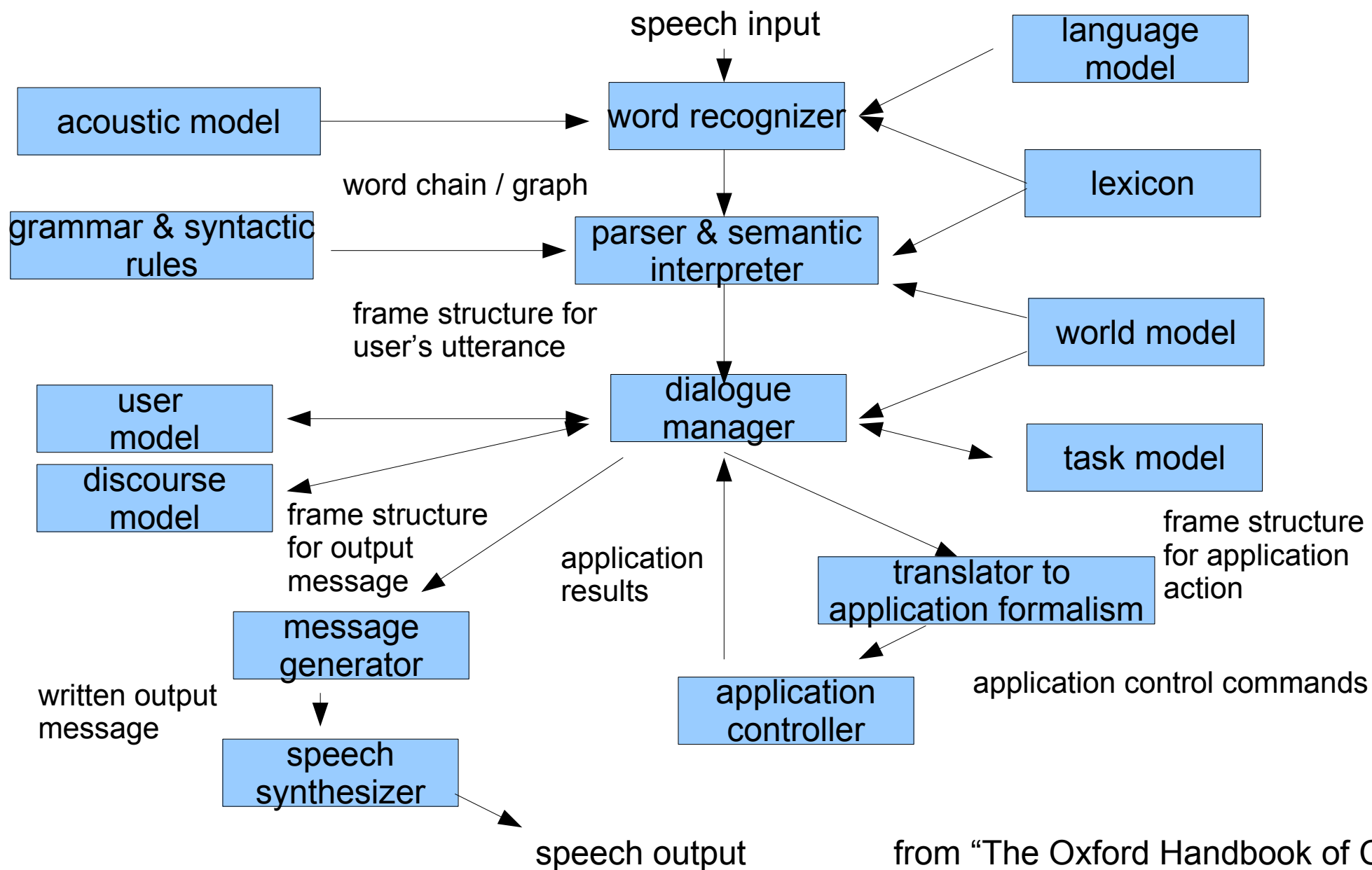
Spoken Dialogue Systems

- SDSs enable users to interact with computer systems using natural and intelligent dialogues, as they would interact with human agents.
- Development of such systems requires many speech and language technologies:
 - Automatic speech recognition - to convert audio signals of human speech into text strings.
 - Language understanding - to interpret the meaning of the recognized utterances.
 - Dialogue processing and response planning - to generate cooperative and useful system replies.
 - Text-to-speech synthesis - to convert answer into speech output.

Using SDSs

- Telephony applications
- Train/airplane travel information
- Weather information
- Automatic call routing
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SDS Architecture



SDSs Examples

- STACC (Automatic Telephone System for Consulting Marks - Spain). This system has been developed during 1996 and implements a service through telephone line that allows the students to consult by speech their marks after the exams by means of a simple phone call. (ceres.ugr.es/~rubio/vitae/papers/STACC.pdf)
- JUPITER - weather forecast information, USA (<http://groups.csail.mit.edu/sls/applications/jupiter.shtml>)

Evolution of Systems

Spoken Dialogue Systems



Multimodal Dialogue Systems

Multimodal Dialogue Systems

- Input: speech, pointing, handwriting, keyboard, face recognition, etc.
- Output: speech, G.U.I, animated agent, etc.
- Examples:
 - SmartKom (<http://www.smartkom.org/>)
 - AdApt (<http://www.speech.kth.se/adapt/>)
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References

- “The Oxford Handbook of Computational Linguistics”, Ruslan Mitkov (Ed.), Cap. 35
- “Computerlinguistik und Sprachtechnologie”, K-U Carstensen & al. (Ed.), Cap.5.9 and 5.10
- NLIs: <http://www.cs.umu.se/~mjm/nlis>
- SDSs:
<http://folli.loria.fr/cds/2004/content/readers/9.pdf>