CLIPS++ contribution within the C-STAR II consortium

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Road Map

- The CLIPS++ group
  - Teams, translation approach, components
- The demonstrator
  - Architecture, Interface
- July 22th demonstration
  - Scenario, outcome, media coverage
- Conclusion & perspectives
The CLIPS++ partner

Joined the consortium in September 1996
Choosed Translation Approach

Speech recognition

source language text

source language → IF

IF text

IF → target language

target language text

Speech synthesis
## Components for French

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Components: Speech Recognition

- Run-on Speaker Independent
  - 10k words vocabulary (centered on the domain)
  - Spontaneous continuous speech
- Client-server architecture
  Use of light clients over the network
- Based on JANUS III toolkit
  in collaboration with Karlsruhe and Carnegie Mellon Universities
Components: Speech Recognition

- Markovian acoustic model
  - Trained with 20 hours of continuous speech (BREF-80 corpus)
  - Context independent

- Stochastic language Model
  - Trained with a 140 million words corpus
  - Optimized for the tourism task
Components: French → IF

- Developed with Ariane-G5
  - MT systems generator (toolkit)
  - 5 Specialized Languages for Linguistic Programming
  - Under VM/ESA/CMS

- Currently running on 3 sites
  - IBM 9221-130 (3.5 mips) at the CLIPS, Grenoble
  - IBM 9672-R14 (40 mips) at the CCSJ, Marseille
  - IBM 9672-RX5 (60 mips) in Montpellier (IBM sponsoring)
Components: French $\rightarrow$ IF

- **Word spotting + local syntactic analysis**
  - **Input**: orthographic transcription of the spoken utterance
  - Morphological analysis & lemmatization of the word
  - First French $\rightarrow$ IF transfer dictionary look up
  - Local syntactic analysis for semantically useful data
    - Dates, quantity, numbers, price
  - Second French $\rightarrow$ IF transfer dictionary look up
  - Syntactic generation of the IF
  - Morphologic generation of the IF
  - **Output**: IF text
Components: IF $\rightarrow$ French

- Partly developed with GBGen
  - Syntactic generation module with broad lexical & grammatical coverage
  - Deterministic system based on a generative grammar
- From an IF to a natural language text
  - Correspondence between the IF and a GBGen semantic structure
  - Generation independent from the application.
Components: IF → French

IF

Correspondence procedures

Semantic GBGen structure

Generation procedures

Syntactic structure

Morphological rules

text
Components: Synthesis

- LAIPTTS: a rule-based TTS synthesizer

- 3 modules
  - Conversion “text towards phonemes”
  - Prosody generation
  - Signal generation
Components: Synthesis

- Conversion “text towards phonemes”
  - General (540) & specialized (numbers, abbreviations, fixed formulae, etc.) rules
  - General (7000 words) & specialized (proper nouns) dictionaries
- Prosody generation
  - Psycho-linguistic rules
- Signal generation
  - Mbrola technique from the Mons University
Demonstrator’s software architecture

- **Reco.**

- **F → IF**
  - IBM Montpellier

- **IF → F**

- **Synthesis**

**LOCAL COMSWITCH**

**ITG**

**GLOBAL COMSWITCH**

- **France**
- **CMU**

**ISDN**

**LAN**
Demonstrator’s hardware architecture

<table>
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<th>PC (local Grenoble)</th>
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<td>User interface</td>
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<td>Reco server</td>
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<td></td>
<td>control</td>
</tr>
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<td>IF → F synthesis</td>
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</table>
Demonstrator’s interface

CLIPS++

September 23rd 1999


COR: Bonjour. Ici Kyuwoong Hwang depuis la Corée.

USA: Bonjour. Ici Chad Langley depuis les États-Unis.


COR: Hello. This is Kyuwoong Hwang from Korea.

USA: Hello. This is Chad Langley from the United States.

ALL: 안녕하세요, 저는 합인니다.

ALL: Hallo, hier ist Monika aus in Deutschland.

ALL: 안녕하세요, 저는 합인니다.
July 22nd’s demo scenario

- Opening with all synthesis on
- Trip to Taejon
- Trip to New York
- Trip to Heidelberg
- Thanks to the travel agents
- About 30 minutes
- Travel agent for ETRI
July 22nd’s demo outcomes

✦ Audience and sponsors were very satisfied
  – Opening ceremony was well received
  – Korean impressed people
  – Entertaining “errors”

✦ The overall speed was not commented

✦ People asked for the release of commercial applications

✦ Videoconference problem imposed improvisation
July 22nd’s demo media coverage

- **Good** even if the date was not that good for the French media
- **Press**
  - National and scientific
- **Radio**
  - Local, National, News broadcaster
- **Television**
  - Local, (National)
- There is still an interest and new contacts
Conclusion & prospect

- Good results
- Very effective cooperation
- Snow ball effect

- Looking forward to technological transfer
  - Necessity to find niches
- Demo for IBM may initiate private companies’ interest (27th of October with ETRI and CMU?)