French Contribution to Showcase One of the NESPOLE! Project: Components and Evaluation.

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Outline

- Introduction
- Analysis: Pattern-based approach
  - Analyzer architecture
  - Steps in detail
    - Turn splitting into SDU
    - Topic, sub-domain detection
    - Argument filling
    - DA construction
- Generation
  - Track 1: Fill in the blanks approach
  - Track 2: Rule-based approach
- First results
- Perspectives

Introduction

French SLT modules

- Handling the client's utterances

Speech Recognition!
RAPHAEL!

French textual output!

Pattern-Based"
Analysis!

IFs!

Introduction

French SLT modules

- Handling the agent's utterances

Generation!
-Fill-in the blanks approach!
-*Rule-based approach*!

French textual output!

Speech Synthesis!
Euler (Mons)!

Sound file!

Introduction

Interchange Format

- Hypothesis
  - c: j aimerais organiser une semaine de vacances dans un parc *(I would like to organize a week of holydays in a park)*
- IF
  - {c give-information +disposition +reservation +trip
    (
    Speech Act Attitude Main-pred Pred-part
)}

Introduction

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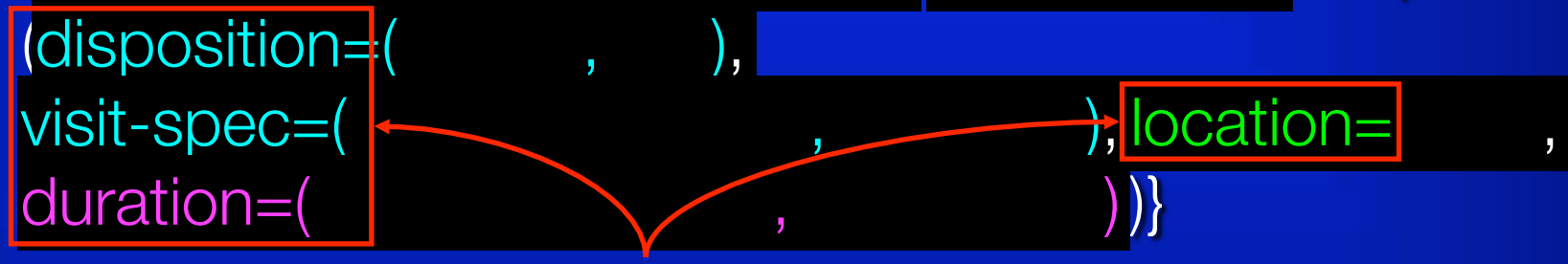
- IF
  - {c:give-information +disposition +reservation +trip
    (disposition=(,),
    visit-spec=(,), location= ,
    duration=(,))}



Introduction

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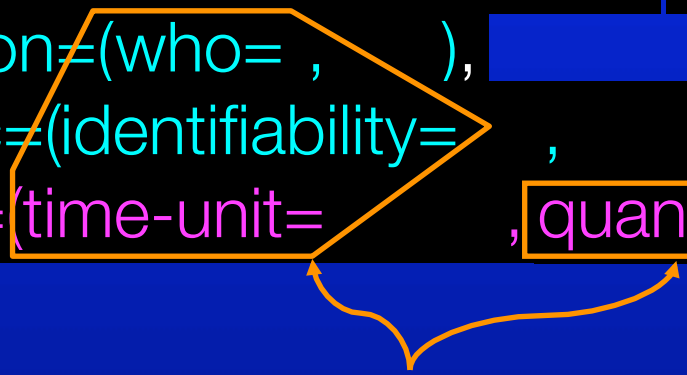
  - {c:give-information +disposition +reservation +trip (disposition=(who= ,), visit-spec=(identifiability= ,), location= , duration=(time-unit= , quantity=))}



Embedded arguments

Introduction

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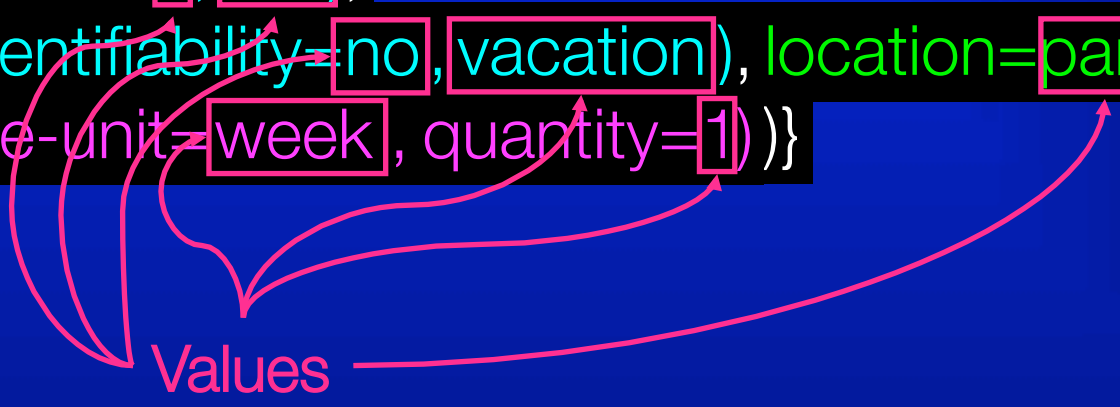
- IF
  - {c:give-information +disposition +reservation +trip (disposition=(who=i, like), visit-spec=(identifiability=no, vacation), location=park, duration=(time-unit=week, quantity=1))}



Introduction

Interchange Format

- Hypothesis
  - c: j aimerais organiser une semaine de vacances dans un parc *(I would like to organize a week of holydays in a park)*
- IF
  - {c:give-information +disposition +reservation +trip (disposition=(who=i , like), visit-spec=(identifiability=no , vacation), location=park , duration=(time-unit=week , quantity=1))}
- Back-translation
  - J'aimerais organiser des vacances dans un parc pendant une semaine. *(I would like to organize holydays in a park during a week.)*

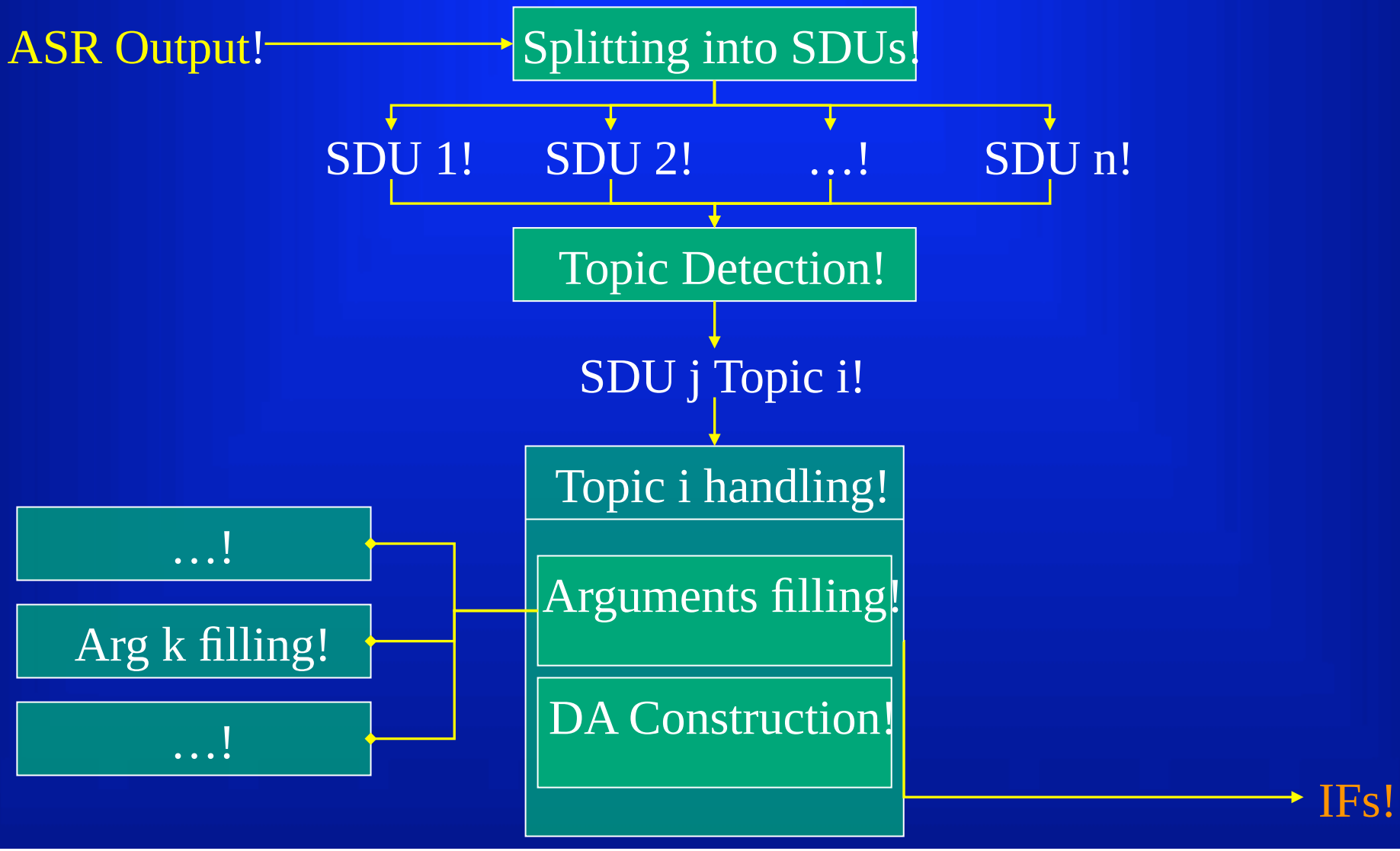
Analysis

Choice

- Necessity to deal with
  - Insertions
  - Deletions
  - Wrong words & agreements
- Arguments as the core of an IF
  - Constrain the possible ones through a topic
  - Find the realized ones among the possible ones
- Phrase spotting mechanism
  - Regular expressions to express their realization
  - Minimal linguistic treatments

Analysis

Architecture



Analysis

Splitting turns into SDU

1. Simple sentences & phrases as SDU boundaries
   - Leading to terminal SA or SA with few continuations

✓ *Affirm*
- *oui c'est ça, bien sûr* – yes that's it, of course

✓ *Negate*
- *non pas du tout, non pas très bien, non* – no not at all, no not very well, no

✓ *Exclamation*
- *c'est excellent, très bien, oh* – that's excellent, very good, oh

✓ *Greeting*
- *bonjour, au revoir, bonne journée* – hello, good bye, have a good day

Analysis

Splitting turns into SDU

❷ Articulations as SDU boundaries

- Rhetorical + pronoun or question

✓ *Examples*

- *et donc je , et puis il, et j', donc on, est-ce que, quel est*
- and thus I, and then he, and I, so we, is …, what is

❸ Treatment of the pronouns

- When rhetorical is not explicitly stated

✓ *Examples*

- I want the room that you proposed earlier
  - One SDU
- I would like a room I need a double room
  - Two SDUs – I would like a room, – I need a double room

Analysis

Topic detection

- Goal
  - Find a terminal SA *or* a focus concept
  - Restrict the search for realized arguments
- Means
  - Keywords are associated with each topic
  - Early matched topic is selected (a hotel with quiet rooms)
- ✓ *Some topics*
  - affirm, greeting, acknowledgment, exclamation, please-wait, …
  - accommodation, activity, attraction, package, room, trip, …

Analysis

Topic handling

- A function per topic (`Topic2If`)
  - Find the realized (instantiated) arguments among the possible ones
  - Calculate the DA
  - Produce the IF, concatenating
    - The speaker
    - The DA
    - The arguments

Analysis

Argument filling

- A specialized function per argument (`Arg2If`)
  - Describing possible realizations of the argument
  - Capturing pertinent information for the IF representation
- ✓ *Exemple*

```
proc RoomSpec2If {inString} {
  ...
  } elseif {[regexp "(?:les) (\[0\-9\]+) ($fifservdico::frenchroom)(?:x|s)?"
                    $inString lMatch lQuantity lRoom]!=0} {
        append the_result "room-spec=(identifiability=yes, quantity=" $lQuantity ", "
                          [fifservdico::Room2If $lRoom] ")"
  } elseif {[regexp "(\[0\-9\]+) ($frenchroom)(?:x|s)?"
                    $inString lMatch lQuantity lRoom]!=0} {
        append the_result "room-spec=(identifiability=no, quantity=" $lQuantity ", "
                          [fifservdico::Room2If $lRoom] ")"
  }
  ...
}
```

Analysis

DA construction

- Construct the DA using
  - The attitudes
  - The realized arguments
    - To get the main-predication and the pred-participants
  - Other information
    - Subject
    - Verbal construction (give-information, request-information, request-suggestion, suggest)
    - Negation of the predicate
    - …

Analysis

Exemple

- Hypothesis
  - c: j aimerais préparer une semaine de vacances dans un parc #
  - c: i would like to prepare a week of vacation in a park #
- Domain:
  - visit
- Arguments:
  - disposition, visit-spec, duration, location
- DA:
  - give-information+disposition+reservation+trip

Generation

Approaches

- Fill in the blanks approach *(next slides)*
- Rule based approach
  - Use (parse) the IF specification files
    - To build dictionary and grammar skeletons
    - To label semantically each link between a terminal symbol of the IF with its possible continuations
  - Steps
    - Associate to each terminal of the IF input the list of its possible labelled continuations (syntax checking);
    - Built a semantic tree of the IF according to the instantiated continuations in the actual IF;
    - Translate all the terminals and structures of the IF into French words and structures;
    - Generate a syntactically well-formed sentence in French.

Generation

Fill in the blanks

- Step 1: Find the normalized DA
  - Discarding the disposition(s)
- Step 2: Find the “fill in the blank sentence”
  - According to some of the possible arguments
- Step 3: Fill in the blanks
  - With the phrases generated for the arguments

⇒ Concatenative generation

Generation

Fill in the blanks

- IF c:give-information+disposition+reservation+trip (disposition=(who=i, like), visit-spec=(identifiability=no, vacation), location=park, duration=(time-unit=week, quantity=1))
- Fill in the blank sentence

  ifDisposition2Text organiser ifVisitSpec2text ifLocation2Text ifTime2Text ifDuration2Text.
- Result
  - J'aimerais organiser des vacances dans un parc pendant une semaine.
  - I would like to organize vacations in a park during a week.

First results

Evaluation

- 4 unseen dialogues, clients' turns
  - Transcription as References
- 2 settings, turns
  - Manually segmented into SDUs *(all languages)*
  - Automatically segmented into SDUs *(analysis module - French only)*
- 6 sets
  - ASR alone: WAR, Hypos as paraphrase of SDU
  - Monolingual translation: FR-FR on ASR, FR-FR on References
  - Bilingual translations: FR-IT on ASR, FR-IT on References
- 3 graders & 3 grades
  - p: perfect, k: OK, b: bad (p+k=acceptable)

First results

Evaluation

ASR WAR Hypo as Paraphrase (%acc)	62% 66%	64% 68%	71% 65%	77% 70%
Monolingual (%acceptable) on Ref/on Rec *[on auto SDU]*	En-En 58%/45%	Ger-Ger 31%/25%	Fr-Fr 54%/41% *[62%/48%]*	It-It 61%/48%
Bilingual (%acceptable) on Ref/on Rec *[on auto SDU]*	En-It 55%/43%	Ger-It 32%/27%	Fr-It 44%/34% *[58%/44%]*	
	It-En 47%/37%	It-Ger 47%/31%	It-Fr 40%/27%	

- ✦! Fr-Fr and Fr-It are comparable with Xx-Xx and Xx-It
- ✦! It-Fr is less good than It-Xx
  - –!French generator less oriented towards agent's IFs

Perspectives

- Pattern-based analysis
  - Quite promising
  - Analyzer for second showcase under development
    - more concepts (actions, attitudes, feature), arguments (feature, focalizer, modifier, rhetorical)
- Fill in the blank generation
  - Towards a better coverage with minimal use of the DA
    - On the fly generated fill in the blanks sentences
- Rule-based generation
  - Should be available for second showcase evaluation