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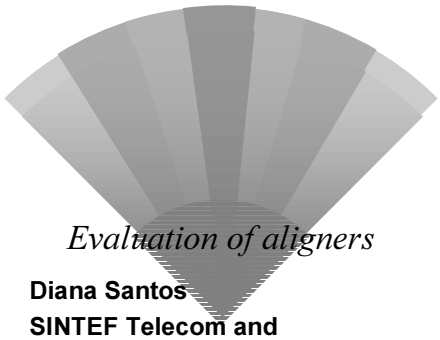

Evaluation of aligners

Diana Santos
SINTEF Telecom and Informatics

Presentation plan

Evaluation: Motivation	**Context: CPP project and COMPARA / DISPARA**
Alignment questions	**Evaluation proper**

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Evaluation

- One can never overemphasize its importance
- Evaluation relative to a particular language
- Are aligners something that is worthwhile to evaluate in itself?

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The importance of evaluation

- Evaluation is itself a first-class research activity: creation of effective evaluation methods drives more rapid progress and better communication within a research community (Hirschman, 1988:302f)
- (Johansson, 1976?)

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Relative to language

- Language-independence is a myth
- Good strategies for one language do not necessarily carry through to other languages
- It is important to evaluate in a particular language in context, beyond ”general” evaluation

Santos (1999)

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Evaluation of alignment

- Gaizauskas (1998:252) distinguishes between *user-visible* vs. *user-transparent* tasks : Clearly alignment is a user-transparent task
- Simard et al. (2000:38), however, states that “[bilingual text alignment] has in fact become a key element leading to recent advances in translation automation”

31.10.00

The COMPARA/DISPARA project

- Initiative of Ana Frankenberg-Garcia (AFG), implementation in collaboration with our project
- *COMPARA* is an English-Portuguese parallel corpus of originals and translations in the 2 directions
- *DISPARA* is a Web interface developed in connection with the *COMPARA* corpus, to make parallel corpora available through the Web

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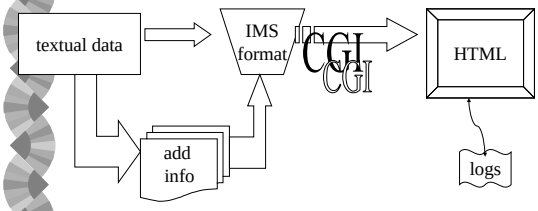
The process



Textual data ranges from simple text to SGML
Information added: from paragraph marking to parsing the text

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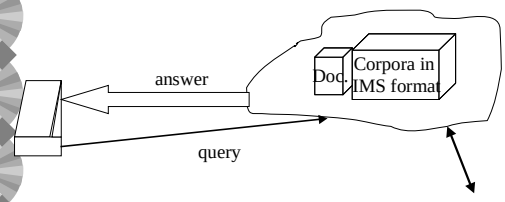
The result



Try http://cgi.portugues.mct.pt/acesso ...

Documentation on the corpora; the encoding; the kinds of queries allowed; the underlying workbench; corpus uses...

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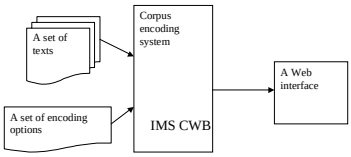
Distributing corpora on the Web



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Creation of COMPARA

- Choice of texts and copyright clearance: AFG
- From raw to Web searchable
  - initial preparation of the texts: AFG
  - preliminary encoding and alignment: CPP
  - alignment revision and annotation: AFG
  - final encoding: CPP
- Interface (*DISPARA*) design
  - functionalities, user requirements: both
  - Web page design: AFG
  - implementation: CPP

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Original (?) features of DISPARA

- Inspection of translator's notes (N.T.)
- Search by alignment type (1:2, 1:1/2, etc.)
- Quantitative display of parallel distribution
- Search in the two directions
- Arbitrarily complex query string in both sides

COMPARA features that differ from ENPC

Different sizes and parts of the texts
Alignment unit always one source sentence.
Not TEI-compliant. Only <title>, <foreign>, <emph> and <note> tags

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DISPARA's look & feel

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What is alignment?

- Not as clear as one would expect…

  even if narrowing to sentence alignment
- How to represent the result of alignment?
  - What counts as a sentence?
  - How to encode suppression/addition of sentences?
  - How to encode reordering of sentences?

Systems differ wildly in these respects and this has consequences for evaluation

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Hofland's aligner vs. EasyAlign

…from a user's perspective

Human input required	No human input
Anchor list required	No anchor list
Adds <s corresp> tags	Encodes in CQP format
Easy to change manually the result	Requires programming to change/inspect results
Expects human revision	Human revision implies second pass
DOS	Unix

Both cases are far from easy to evaluate !!!

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Example of TCA's output

<s **id=DL2.1.s15 corresp='DL2 TP. 1.s15 DL2 TP. 1.s16'**>She faced him, undefiant but confident, and said, "I wonder if hey will accept us?"</s>
<s **id=DL2.1.s16 corresp='DL2 TP. 1.s17 DL2 TP. 1.s18'**>And, as she had known he would, he said, "It is a question of whether we will accept them."</s>
<s **id=DL2.1.s16 corresp='DL2 TP. 1.s17 DL2 TP. 1.s18'**>And, as she had known he would, he said, "It is a question of whether we will accept them."</s>
 <s **id=DL2.1.s 17 corresp='DL2 TP. 1.s19**>She had withstood the test on her, that bony pain, and he let her wrist go and went on to the door.</s>

<s **id=DL2 TP. 1.s15 corresp=DL2. 1.s15**>Ela encarou-o, sem desafio mas confiante, e perguntou:</s>
<p **id=DL2 TP. 1.p6**> <s **id=DL2 TP. 1.s16 corresp=DL2.1.s15**> — Achas que nos aceitam?</s> <p **id=DL2 TP. 1.p7**>
<s **id=DL2 TP. 1.s17 corresp=DL2. 1.s16**> — E, conforme sabia que Jasper responderia, este retorquiu:</s> <p **id=DL2 TP. 1.p8**> <s **id=DL2 TP. 1.s18 corresp=DL2.1.s16**>— É tudo uma questão de nós os aceitarmos a eles.</s>
<p **id=DL2 TP. 1.p9**>
<s **id=DL2 TP. 1.s19 corresp=DL2.1.s17**>Alice resistira ao teste sobre a sua pessoa, à dor óssea, e ele largou-lhe o pulso e dirigiu-se para a porta.</s>

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Example of EasyAlign output

```
Displaying alignment for [teste-i, teste] from file 'testepi.alinh'
Enter 'h' for help.
>> 1:1-alignment [0, 9] x [0, 11] (169)=========================================
Six North Africans were playing boule        Seis Norte-africanos estavam a jogar
beneath Flaubert's statue .                  boule sob a estátua de Flaubert .
1:1-alignment [10, 19] x [12, 22] (51)=======================================
Clean cracks sounded over the grumble        As pancadas secas ouviam-se sobre o
of jammed traffic .                          ruído do trânsito congestionado .
1:2-alignment [356, 390] x [386, 421] (255)==================================
At Trouville Flaubert's upper thigh          Em Trouville , a parte superior da
has had to be patched , and bits of          coxa de Flaubert teve de ser remendada
his moustache have fallen off :              e caíram farripas do bigode . No lábio
structural wires poke out like twigs         superior os ferros da estrutura saem
from a concrete stub on his upper lip        como ramos de um toro de cimento .
.
```

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Evaluation

- First phase (Santos & Oksefjell 2000)
  - Basic quantitative measures
  - Full anchor list; full corpus
- Second phase
  - More linguistically motivated evaluation
- Comparison with other published evaluations

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S&O 2000's reported evaluations

1. Estimate the revision and correction involved for a given set of E-P texts
2. Estimate the contribution of the anchor word list to the above process
3. Look at the content of the anchor word list, for each entry and for each pair

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Interesting findings (S&O 2000)

- Many independent indicators make for a robust performance
- Cross-categorial match

  nation.*? / ((país.*?)|(naç.*?)|(naciona.*?))

  imagin.*? / imagin.*?
- Success not always linguistically motivated
  - not expected
  - wrong match; right alignment

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Unexpected hits (S&O 2000)

buil.* / constru.*

- *Once the job is finished the **builders** are killed*
- *Terminada a obra, os **construtores** serão mortos.*

earli.* / cedo:

- *She worked harder than anybody else, got up **earlier**, came to bed long after the others*
- *Ela trabalhava mais que qualquer um, acordava **cedo**, era a que ia dormir mais tarde.*

crim.* / crim.*:

- *... arrived in Sicily from somewhere far away, perhaps the **Crimea**, and within a few days ...*
- *... chegou à Sicília vinda de um lugar distante, talvez da **Criméia**, e em poucos dias ...*

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Hits by chance (S&O 2000)

look.* / olh.*

- *which makes my face **look** pallid and ill, with circles under the eyes.*
- *que dá à minha cara um aspecto pálido e doentio, com **olheiras**.*

be / ((ser)|(estar))

- *one will always **be** a stranger*
- *um **ser** ('being', n.) humano sempre será um estranho*

couple.* / par.*

- *After a **couple** of years to settle down,...*
- *Depois de alguns anos **para** ('for') se estabelecer, ...*

little / pequen.*

- *was a little group of children, the eldest girl wheeling a pushchair with two **smaller** children,*
- *ia um grupo de crianças, a mais velha a empurrar um carrinho, com duas crianças mais **pequenas**, uma de cada lado*

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Concluding remarks (S&O 2000)

- Evaluation is a time and resource consuming task
- The strengths of an NLP system may not depend crucially on the quality of the linguistic information
- A language-dependent system may not be that language-dependent after all
- Decrease of performance by adapting to a new language pair is hard to measure
- Such a detailed study pinpoints interesting areas of textual differences between the two languages, and thus areas for contrastive research

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Interesting research questions

- Are grammatical or lexical clues the best anchors?
- How much does crosscategorial translation help?
- Does translation direction play a role?
- What kind of translation profile is best for alignment?

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