SECTra_w.1 : an Online Collaborative System for Evaluating, Post-editing and Presenting MT Translation Corpora

Cong-Phap HUYNH
Christian BOITET
Hervé BLANCHON

Laboratoire LIG, GETALP, GETA
385, rue de la Bibliothèque, 38041 Grenoble, France

Tuesday 29/5/2008

Outline

- Introduction
- Motivations
  - □ make multilingual parallel corpora
    - ➢ richer: multimedia (text, speech), multiannotated, multiusage
    - ➢ accessible through the Web (replay, reading)
    - ➢ processable through the Web (evaluation, annotation, improvement, extension to other languages)
- SECTra_w.1 is mainly for:
  - □ storing & presenting parallel multimedia corpora
  - □ evaluating of MT systems
    - ➢ classical evaluations (MT evaluation campaigns)
      - ♦ subjective (fluidity, adequacy)
      - ♦ objective (n-gram-based metrics such as BLEU, NIST…)
    - ➢ task-related objective evaluation

Introduction

- Recent MT evaluation campaigns have been criticized
  - □ only tables of figures such as scores (BLEU, NIST, ORANGE, METEOR…) are shown as results
  - □ these n-gram-based measures have been shown not to correlate very well with human judgments, contrary to initial expectations

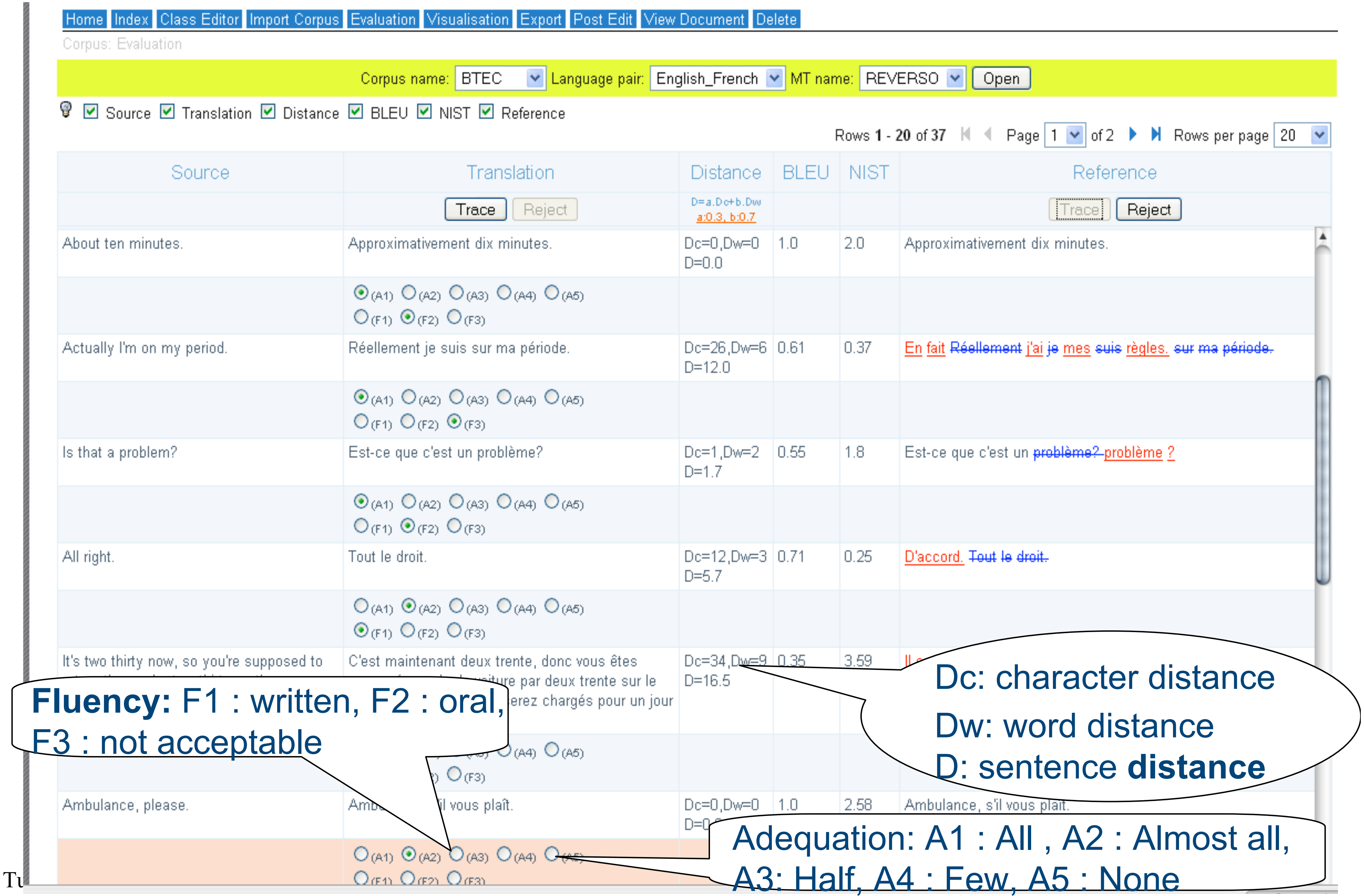
[Callison-Burch & al. 2006]

- Commercial MT systems are ranked
  - □ consistently low by these measures
  - □ quite high, or highest by human judges
- Hence, it would be good to look at the real data and to "see for ourselves"
- SECTra_w.1
  - □ shows tables of figures as results of an evaluation campaign
  - □ shows the real data (source, MT outputs, references, post-edited outputs)
  - □ makes the post-edition effort sensible

Motivations

- Subjective evaluation biases
    - □ showing a reference translation of an input instead of the input itself when judging adequacy
        - ➢ Reference translations are not 100% adequate!
    - □ showing to 1 judge the results of several MT systems in parallel
        - ➢ S/he compares them instead of grading them independently
- Other people would like to do subjective evaluation after the evaluation campaign
    - □ in a certain application setting
    - □ for their research
- Proposal: task-related measure of the "real" MT quality
    - □ i.e. **utility** of MT outputs for a certain **task**
    - □ Tasks: HQ understanding, HQ translation, HQ communication
    - □ SECTra_w.1 concentrates now on producing HQ translations
        - ➢ MT post-editing
        - ➢ measures of the effort

SECTRa_w.1 used for MT evaluation



Home | Index | Class Editor | Import Corpus | Evaluation | Visualisation | Export | Post Edit | View Document | Delete

Corpus: Evaluation

Corpus name: BTEC Language pair: English_French MT name: REVERSO Open

☑ Source ☑ Translation ☑ Distance ☑ BLEU ☑ NIST ☑ Reference

Rows **1 - 20** of **37** Page 1 of 2 Rows per page 20

Source	Translation	Distance	BLEU	NIST	Reference
	Trace Reject	D=a.Dc+b.Dw a:0.3, b:0.7			Trace Reject
About ten minutes.	Approximativement dix minutes.	Dc=0,Dw=0 D=0.0	1.0	2.0	Approximativement dix minutes.
	● (A1) ○ (A2) ○ (A3) ○ (A4) ○ (A5) ○ (F1) ● (F2) ○ (F3)				
Actually I'm on my period.	Réellement je suis sur ma période.	Dc=26,Dw=6 D=12.0	0.61	0.37	En fait ~~Réellement~~ j'ai ~~je~~ mes ~~suis~~ règles. ~~sur ma période.~~
	● (A1) ○ (A2) ○ (A3) ○ (A4) ○ (A5) ○ (F1) ○ (F2) ● (F3)				
Is that a problem?	Est-ce que c'est un problème?	Dc=1,Dw=2 D=1.7	0.55	1.8	Est-ce que c'est un ~~problème?~~ problème ?
	● (A1) ○ (A2) ○ (A3) ○ (A4) ○ (A5) ○ (F1) ● (F2) ○ (F3)				
All right.	Tout le droit.	Dc=12,Dw=3 D=5.7	0.71	0.25	D'accord. ~~Tout le droit.~~
	○ (A1) ● (A2) ○ (A3) ○ (A4) ○ (A5) ● (F1) ○ (F2) ○ (F3)				
It's two thirty now, so you're supposed to	C'est maintenant deux trente, donc vous êtes …iture par deux trente sur le …erez chargés pour un jour	Dc=34,Dw=9 D=16.5	0.35	3.59	Il …
	… ○ (A4) ○ (A5) … ○ (F3)				
Ambulance, please.	Amb… …il vous plaît.	Dc=0,Dw=0 D=0…	1.0	2.58	Ambulance, s'il vous plaît.
	○ (A1) ● (A2) ○ (A3) ○ (A4) ○ (A5) ○ (F1) ○ (F2) ○ (F3)				

Fluency: F1 : written, F2 : oral, F3 : not acceptable

Dc: character distance

Dw: word distance

D: sentence **distance**

Adequation: A1 : All , A2 : Almost all, A3: Half, A4 : Few, A5 : None

Classical MT evaluation in SECTra_w

- Subjective evaluation
  - Principles and organization
    - Several judges can perform evaluation
      - at the same time on the same part of the data
    - A segment receives several evaluation scores
      - these scores can be seen by users
    - Integration of a "workflow"
      - to define the judges and assign them sets of pages to evaluate
  - Protocol
    - slightly different of the protocol proposed by NIST
      - In TIDES evaluation campaign
    - Fluency
      - F1 : written, F2 : oral, F3 : not acceptable
    - Adequation
      - A1 : All , A2 : Almost all, A3: Half, A4 : Few, A5 : None

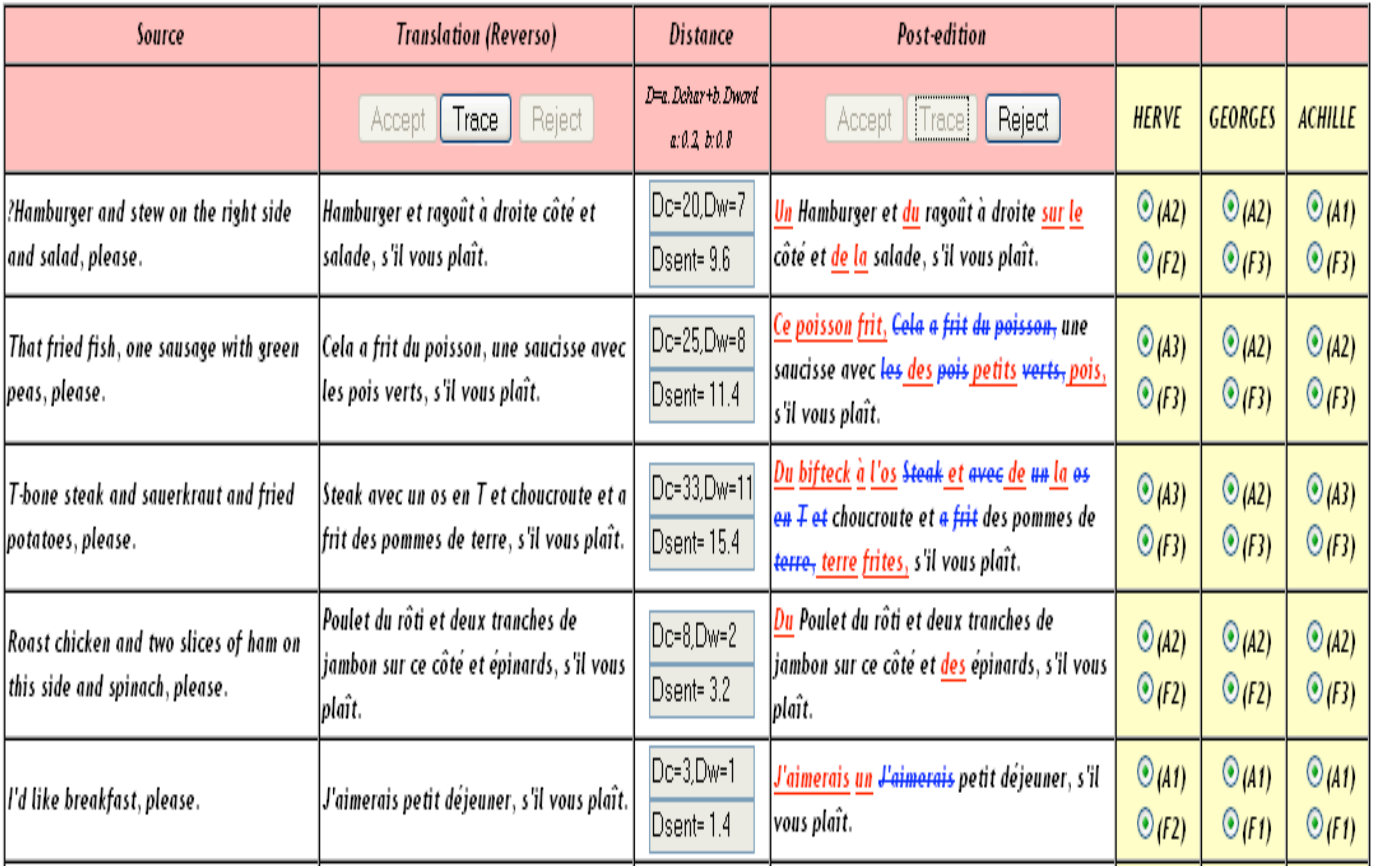
Classical MT evaluation in SECTra_w (2)

- Objective n-gram-based scores
  - □ n-gram-based measures
    - we started from NIST scripts for BLEU, NIST…
    - reimplementation in Java, integration in SECTra_w
  - □ Edit distances
    - Character, word, and sentence distances
      - ♦ Character: D_c = Levenshtein distance (Wagner&Fisher)
        - Cost (c1, c2) = 1
      - ♦ Word: D_w = pseudo-distance (Damereau & Fisher)
        - Cost (w1, w2) = D_c (w1, w2)
        - D_w (s1, s2) = D'_c (s1, s2) with 'characters' = words
      - ♦ WER=D_w and character-based distance=D_c
    - Sentence distance
      - ♦ $D_{Sent} = \alpha D_c + \beta D_w$ (α and β modifiable, sum to 1)

Task-related Objective Evaluation

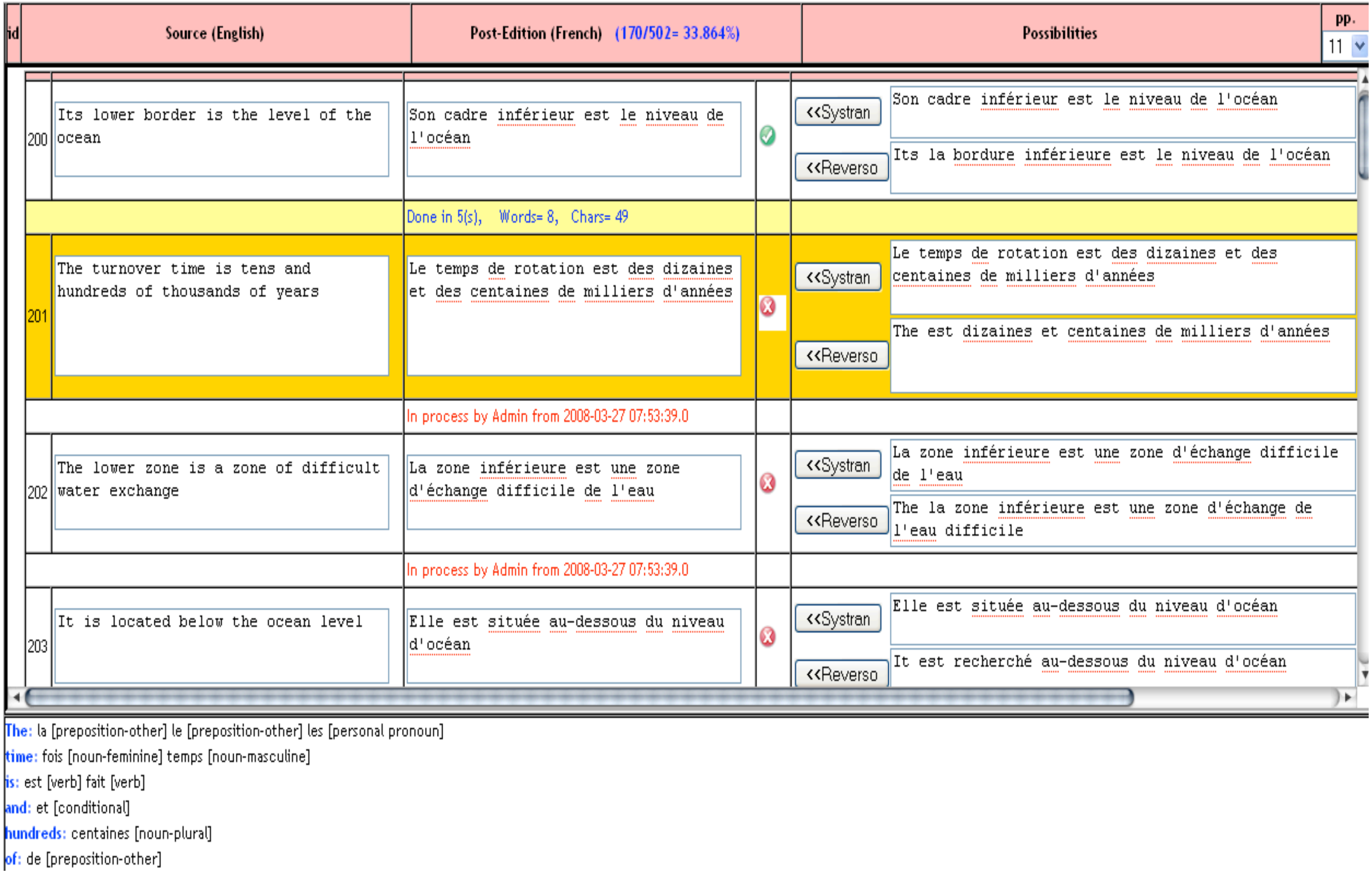
- Time taken to perform the task: post-edition, booking, understanding…
  - □ In the profession, translators are paid by word or by page
    - with rates corresponding to the time taken
    - itself linked to the difficulty of the task
  - □ The simplest and most reliable measure is the sentence distance
    - informative if one measures D(MT result, MT post-edited)
    - usable to deduce the post-edition time even if done offline
  - □ Measures such as WER and mWER, as currently used,
    - are edit distances,
    - but are not related to the task performed
    - because they compare an a priori reference and the result

Evaluation results and post-edition effort



Source	Translation (Reverso)	Distance	Post-edition			
	Accept Trace Reject	D=a.Dchar+b.Dword a:0.2, b:0.8	Accept Trace Reject	HERVE	GEORGES	ACHILLE
?Hamburger and stew on the right side and salad, please.	Hamburger et ragoût à droite côté et salade, s'il vous plaît.	Dc=20,Dw=7 Dsent= 9.6	Un Hamburger et du ragoût à droite sur le côté et de la salade, s'il vous plaît.	○ (A2) ○ (F2)	○ (A2) ○ (F3)	○ (A1) ○ (F3)
That fried fish, one sausage with green peas, please.	Cela a frit du poisson, une saucisse avec les pois verts, s'il vous plaît.	Dc=25,Dw=8 Dsent= 11.4	Ce poisson frit, ~~Cela a frit du poisson,~~ une saucisse avec ~~les~~ des ~~pois~~ petits ~~verts,~~ pois, s'il vous plaît.	○ (A3) ○ (F3)	○ (A2) ○ (F3)	○ (A2) ○ (F3)
T-bone steak and sauerkraut and fried potatoes, please.	Steak avec un os en T et choucroute et a frit des pommes de terre, s'il vous plaît.	Dc=33,Dw=11 Dsent= 15.4	Du bifteck à l'os ~~Steak~~ et ~~avec~~ de ~~un~~ la ~~os en T et~~ choucroute et ~~a frit~~ des pommes de ~~terre,~~ terre frites, s'il vous plaît.	○ (A3) ○ (F3)	○ (A2) ○ (F3)	○ (A3) ○ (F3)
Roast chicken and two slices of ham on this side and spinach, please.	Poulet du rôti et deux tranches de jambon sur ce côté et épinards, s'il vous plaît.	Dc=8,Dw=2 Dsent= 3.2	Du Poulet du rôti et deux tranches de jambon sur ce côté et des épinards, s'il vous plaît.	○ (A2) ○ (F2)	○ (A2) ○ (F2)	○ (A2) ○ (F3)
I'd like breakfast, please.	J'aimerais petit déjeuner, s'il vous plaît.	Dc=3,Dw=1 Dsent= 1.4	J'aimerais un ~~J'aimerais~~ petit déjeuner, s'il vous plaît.	○ (A1) ○ (F2)	○ (A1) ○ (F1)	○ (A1) ○ (F1)

Interface of task-related objective evaluation



id	Source (English)	Post-Edition (French) (170/502= 33.864%)		Possibilities	pp. 11
200	Its lower border is the level of the ocean	Son cadre inférieur est le niveau de l'océan	✓	<<Systran Son cadre inférieur est le niveau de l'océan <<Reverso Its la bordure inférieure est le niveau de l'océan	
		Done in 5(s), Words= 8, Chars= 49			
201	The turnover time is tens and hundreds of thousands of years	Le temps de rotation est des dizaines et des centaines de milliers d'années	✗	<<Systran Le temps de rotation est des dizaines et des centaines de milliers d'années <<Reverso The est dizaines et centaines de milliers d'années	
		In process by Admin from 2008-03-27 07:53:39.0			
202	The lower zone is a zone of difficult water exchange	La zone inférieure est une zone d'échange difficile de l'eau	✗	<<Systran La zone inférieure est une zone d'échange difficile de l'eau <<Reverso The la zone inférieure est une zone d'échange de l'eau difficile	
		In process by Admin from 2008-03-27 07:53:39.0			
203	It is located below the ocean level	Elle est située au-dessous du niveau d'océan	✗	<<Systran Elle est située au-dessous du niveau d'océan <<Reverso It est recherché au-dessous du niveau d'océan	

The: la [preposition-other] le [preposition-other] les [personal pronoun]
time: fois [noun-feminine] temps [noun-masculine]
is: est [verb] fait [verb]
and: et [conditional]
hundreds: centaines [noun-plural]
of: de [preposition-other]

Experiment and validation

- Evaluation campaign
  - funded by FT R&D (TRANSAT project)
  - 2 English-French corpora
    - constructed from English segments from the BTEC corpus
    - In total ~5000 evaluation sentences
    - distributed by ATR for IWSLT-06
      - 2 commercial MT systems and 1 research MT system
      - post-editions of MT results
  - subjective evaluation
    - 12 judges
    - subjective evaluation cost compared with that of IWSLT-06
      - time diminished by a factor of about 5

Conclusion

- SECTra_w.1
  - □ a web-oriented system for managing multilingual corpora
  - □ mainly dedicated to the evaluation of MT systems
    - ➢ subjective evaluation (fluidity, adequacy)
    - ➢ objective n-gram-based scores
    - ➢ task-oriented evaluation
      - ♦ by letting humans post-edit the MT results
      - ♦ measuring an edit distance (and/or the post-editing time)
  - □ Experiment
    - ➢ In an evaluation campaign funded by FT R&D (Nov. 2008)
    - ➢ on two English-French corpora
      - ♦ 5,000 sentences translated by Systran and Reverso
      - ♦ 12 judges
  - □ Conclusions
    - ➢ Good usability, practical, reliable, fast enough
    - ➢ Still many improvements in view

Future work

- □ Improve user and work management
  - ➢ Put workflow under control of linguistic managers
  - ➢ Enable direct communication between users
    - ♦ Now only possible by posting comments (or e-mail…)
    - ♦ Inspiration from BEYRans (Y. Bey) — for volunteer translators

- ■ SECTra_w.2 (already in operation)
  - □ Used to support post-edition in the EOLSS/UNL-fr project
    - ➢ 25 documents, ≈ 220K words or 880 pages
    - ➢ ≈ 25 volunteer (researchers) and paid (students) translators
    - ➢ Reverso, Systran, UNL-fr deconversion for pretranslation
  - □ Will be included as component of various iMAGs
    - ➢ iMAG = interactive Multilingual Access Gateway
      - ♦ Translation gateway dedicated to some web site/domain
      - ♦ Having a specialized TM (SECTra_w) and LexDB

Related publications

- Huynh C. P., Boitet Ch., Fafiotte G. (2008) *Extending an On-line Parallel Corpus Management System to Handle Specific Types of Structured Documents.* SLTU Conference, MICA, Hanoi, Viet Nam, May 2008, 6p.
- Huynh C. P., Boitet Ch., Blanchon H., Nguyen H. T. (2008) *A Web-oriented System to Manage the Translation of an Online Encyclopedia Using Classical MT and Deconversion from UNL.* COLING Conference, Manchester, England, August 2008, 7p. (submitted).

The end

Cảm ơn

Thank you

Merci