Lecture 6.1: MT Evaluation

What is MT Evaluation?

- How good is MT?
  - Define what is the “expected” quality
- Define metric(s)

  => Human evaluation

  => Automatic evaluation

Human evaluation scoring: Adequacy / Fluency

- **Adequacy**: how much information is transferred between the original and the translation.
  Is the original meaning preserved in English?
- **Fluency**: how good is the translation?
  (*Ignoring original) How fluent is the English?*

What you should not do!

- Round-trip evaluation RTT / reverse translation / back-and-forth translation (bad technique!)
  - Machine translate a source text
  - “back-translate” the MT
  - Look how similar it is

  Very bad method, translation are not “transitive”, a 100% transfer MT would be best than any other.

  “RTT is good … for nothing” [Sommer 2006]

Difficult problem

- Many translations are acceptable
  - Subjective human judgment
  - Challenge of automatic evaluation
- Quality criteria:
  - Adequacy
  - Fluency
  - Is the original information understandable?
  - Is it easy/quicker to rephrase the output to get it publishable?
  - Is this new MT system better than the previous?
  - *A* better than *B*?
  - Speed? Accessibility? Usability?
- Some non-scientific criteria:
  - I am a translator, is that product going to take out my job? ☺
  - I am a computer scientist, do I really care what MT quality means? ☺
  - I am spending $ in translation, is quality that important? ☺

Evaluation criteria, scale

- **Adequacy**

How much of the meaning expressed in the gold-standard translation or the source is also expressed in the target translation?

  - 5 Everything / All meaning is preserved
  - 4 Most meaning is preserved
  - 3 Much meaning is still there
  - 2 Little meaning
  - 1 None of the original meaning is there

- **Fluency**

To what extend the translation is grammatically well formed, contains correct spellings, is close to natural English (including terminology, names etc.)

  - 5 Flawless
  - 4 Good
  - 3 Non-native
  - 2 Disfluent
  - 1 Incomprehensible

MT evaluation in real life

- What a MT developer cares about:

  Instant quality measure of a system
- What a user of your gist MT wants: original information is preserved (adequacy). But often can only judge the fluency
- What a translator needs: post-editing the MT. Both fluency & adequacy are important
- What your manager cares about:

  Costs

Human evaluation scoring: Examples

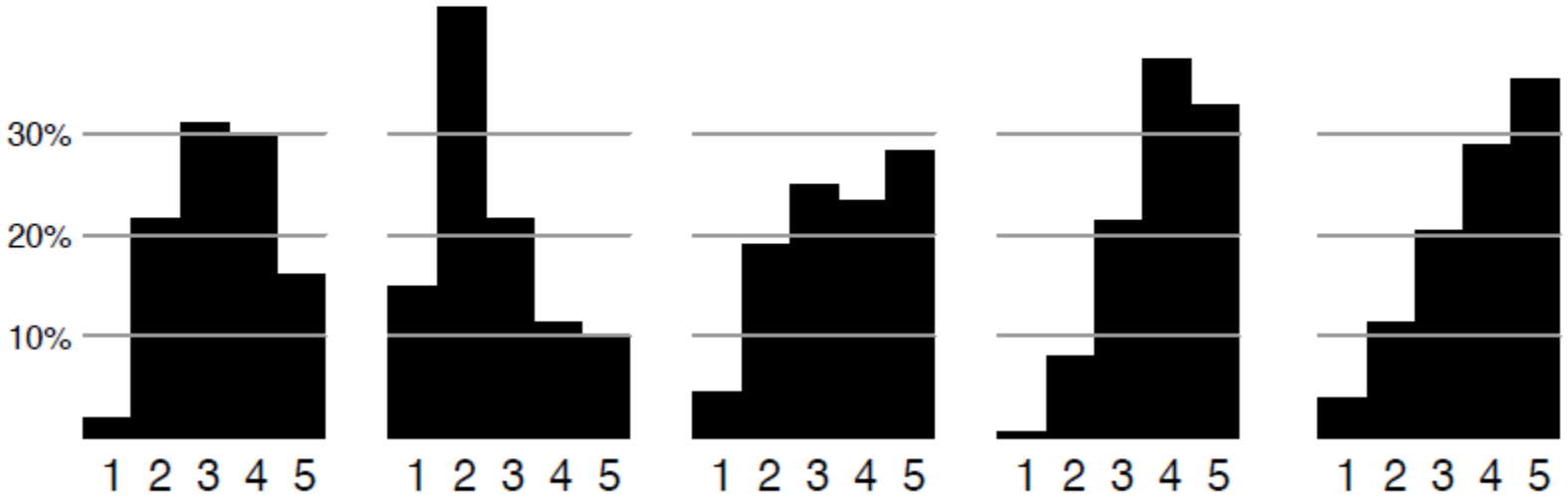
- Fr: Le chat est dans la maison bleue

  Gloss: [the] [cat] [is] [in] [the] [house] [blue]
- Mt: The dog is in the brown house
  - adequacy: 2 – little meaning is preserved
  - fluency: 5 - flawless English
- Mt: In the house blue is the cat
  - adequacy: 5 – all meaning has been transferred
  - fluency: 2 - disfluent English

Evaluators disagree

Evaluators Disagree

Histogram of adequacy judgments by different human evaluators



(from WMT 2006 evaluation)

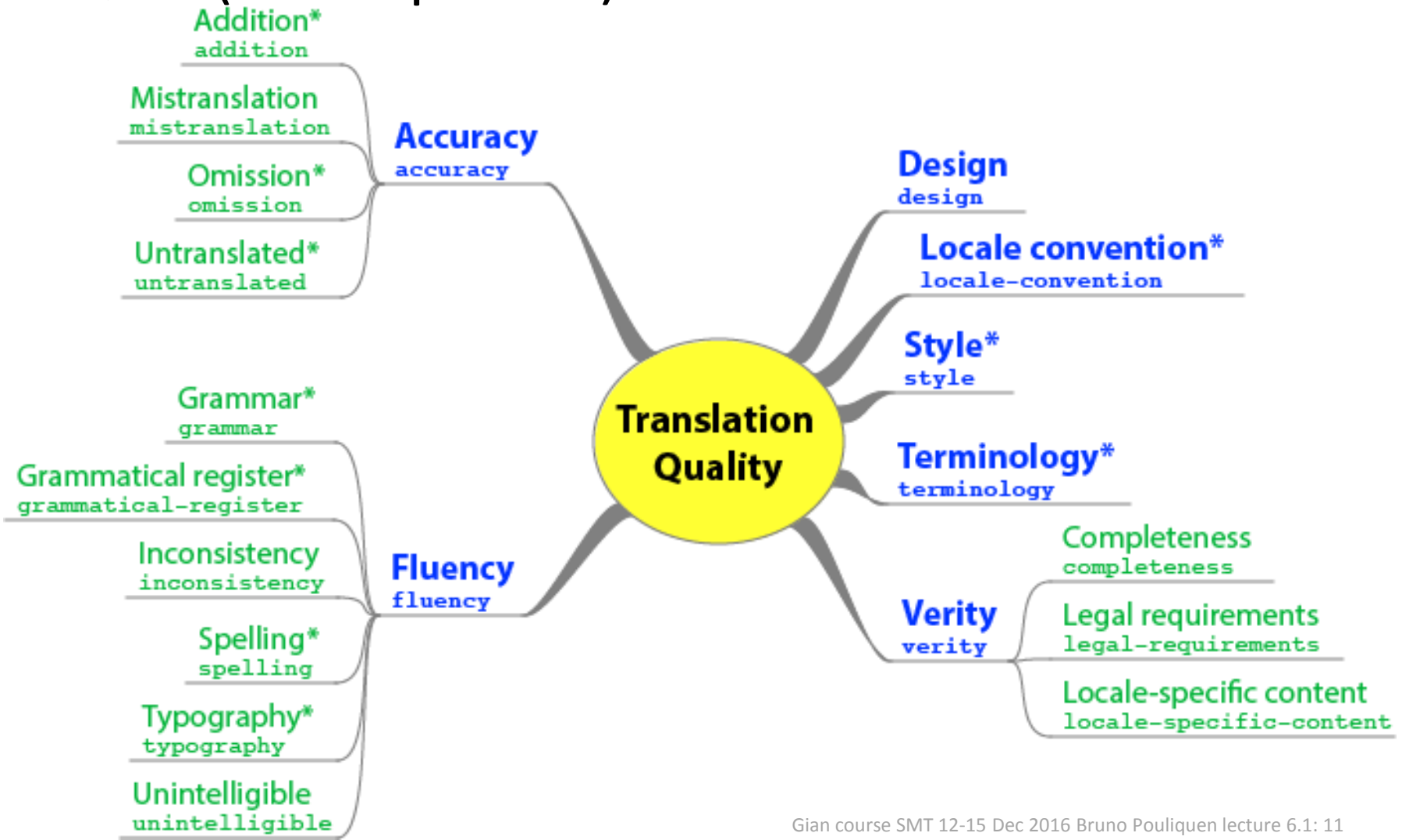
Human evaluation, ranking:

- Is translation from system *A* better than system *B* (and/or systems *C*,*D*…)?
- "Double blind"
- Evaluators are more consistent

Evaluation type	$P(A)$	$P(E)$	K
Fluency	.400	.2	.250
Adequacy	.380	.2	.226
Sentence ranking	.582	.333	.373

Human evaluation: error annotation

- Qt21 (www.qt21.eu)



Human evaluation>task based

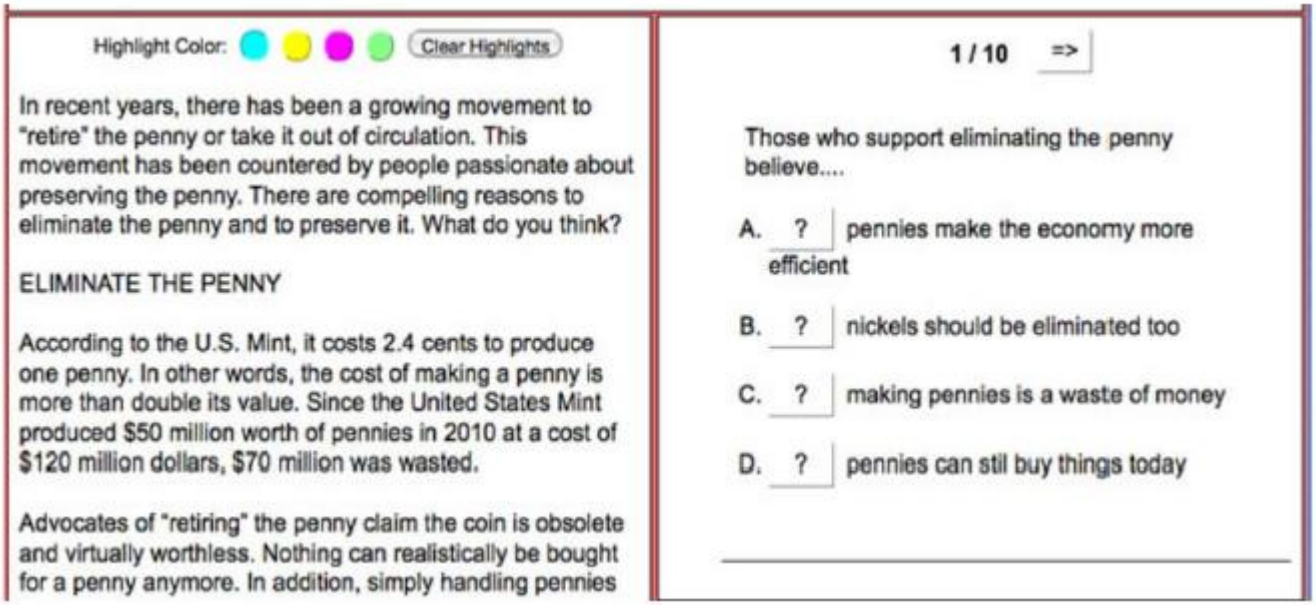
- Instead of asking evaluators “how good/bad is MT?”, let them use MT and look at the output
- Two families:
  - Collect post-editions, look at speed (average seconds per word) / number of edits (HTER)
  - Ask users to read a MT text
    - Ask questions about what they understood
    - Look at eyetracking

Human evaluation>task based>HTER

- Human-targeted Translation Error Rate (Snover et al. 2006)
- HTER = (Substitutions + Insertions + Deletions + Shifts)/Reference Words

Human evaluation>task based>reading

- Comprehension



From [Specia, 2016]

- Eye tracking

Automatic evaluation

- Certainly not the most accurate, but the cheapest! (objective and flexible)
- Based on “reference translation(s)”, compute similarity between MT output and the original (human) translation