European Live Translator

Barry Haddow; October 8th, 2019; MetaForum

H2020 RIA Elitr (2019-2021)

ELITR (European Live Translator) aims:

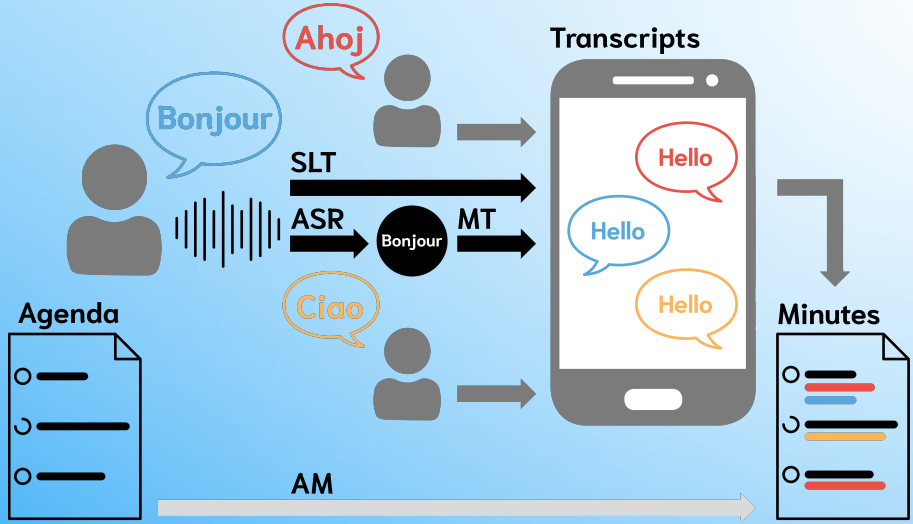
- Highly multi-lingual machine and speech translation.
- Document-level machine translation.
- Automatic meeting summarization, “Minuting”.

THE UNIVERSITY of EDINBURGH

. . . and the Supreme Audit Office of the Czech Republic as affiliated user partner.

Main ELITR event: Interpreting at EUROSAI Congress (Prague, May 2020).

ELITR Technologies

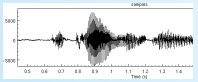


ASR Challenges

- Robustness of acoustic models.
  - Background noise, speaker accent/dialect, microphone settings are critical.
  - Approaches: modulation with modality vectors, TDNNs, new methods.
- Domain adaptation (Supervised or semi-supervised).
  - Domain adaptation of LM in ASR is very important for the final performance.
  - Seed material may be available, but always small in size.
  - Approach: Expand seed material, either instantly or more with a delay.
- Life-Long Learning during deployment phase.
  - World, language, topics constantly change.

  $\rightarrow$ Performance degrades over time.
  - Approaches: Unsupervised learning from data seen in deployment, user feedback.

SLT Challenges



ASR

was the uh time

MT

¿Qué hora es?

Direct SLT

– Normalisation and Segmentation

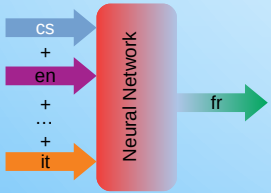
– Robustness

MT Challenges

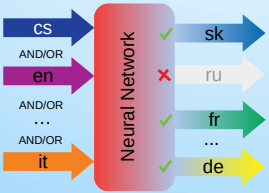
- Document-level translation:
  - Lexical and structural coherence.
  - Context perhaps even more important for speech translation.
- High multi-linguality:

Multi-target (Efficiency)

Multi-source (Ambiguity resolution)



Flexible Multilingual



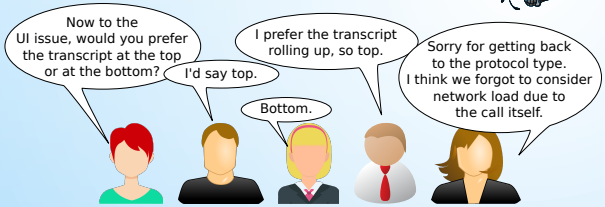
Meeting Summarization

High-risk goal:

- Given agenda and transcript.
- Populate the agenda with items from the transcript to obtain **meeting minutes**.

= Structured summarization of discussions.

- "De-duplicating" rather than reducing content.
- Critical: Gather such data.



Original agenda as prepared by the organizer beforehand:
- Protocol type: push or pull?
- Layout of the user interface:
  - Transcript grows at the top or bottom of the document?
  - Or in a side pane?

Shared document, everyone allowed to edit.
Starts with the agenda and gets populated by Automatic Minuting (AM)
- Protocol type: push or pull?
  - (AM) > Pull easier to implement.
  - (AM) > Updates can get lost with push *in case the user*
  - (AM) > Consider network load.
- Layout of the user interface:
  - Transcript grows at the top or bottom of the document?
    (AM) > Top (AM) > Bottom (AM) > Top, transcript rolling up.
  - Or in a side pane?

Transcript, optionally editable to correct ASR errors:
11:03 Sorry for getting back to the protocol type. I think we forgot ...
11:02 I prefer the transcript rolling up, so top.
11:02 Bottom
...

Integration and Deployment Challenges

- (Get it all running.)
- (All components compatible: API, segmentation, normalization, . . .)

Practical challenges:

- **Sound acquisition.**
- **On-line ASR + MT** for user experience.
  - On-line = incomplete sentences, preliminary output and correction.
- Output delivery (incl. wifi failing).
- Presentation (slides in front vs. subtitles on handheld device).

Summary

- ELITR will develop and deploy:
  - Live subtitling and translation of speeches in a highly multi-lingual setting.
- ELITR will improve SoA in:
  - ASR adaptation and robustness, life-long learning.
  - Document-level and multi-lingual machine translation.
  - ASR+MT integration into SLT.
- ELITR will prototype:
  - Automatic summarization of meetings.