Details of the MGB Challenge data preparation

P. Lanchantin, P. Bell,
J. Kilgour, X.Liu, O. Saz

Natural Speech Technology

Edinburgh – Cambridge – Sheffield

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Dataset description & prepararation

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- supply pre-processed data enabling participants to focus their time on novel research
- Task 1: **Transcription**
  - train (2193 episodes/ 1580h audio /1197h active speech) (subtitles)
  - dev (47e/28h/20h) (subtitles+manual)
  - eval (15e/11h) (manual)
- Task 2: **Alignment**
  - same as transcription dev+eval
- Task 3: **Longitudinal transcription**
  - dev: (19e/12h/8.5h) (subtitles+manual)
  - eval (19e/14h) (manual)
- Task 4: **Speaker diarisation and linking**
  - same as longitudinal dev+eval

Transcription refinement

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- extracted from *TV-1week+TV-6week+Mediaeval* corpora
- provided transcriptions are generally **imperfect** and need to be refined to be used for the training of acoustic models (AM)
  - different source, constant lag, re-speaking ...
- forced-alignement of the transcript
  1. **automatic segmentation** into speech/nonspeech segments (rt-04)
  2. decoding of speech segments using **LM biased towards the transcripts**
  3. detection of **matching word sequences** between the decoded hypotheses and the transcript
  4. force-alignement of the remaining text on the remaining speech segments
  5. computation of confidence measure (**matching error rate** (Phone and Word MER) for each segment

Transcription refinement

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- Iterative process
  - The same process is done iteratively using new acoustic models (AM) trained on the aligned transcrips

dataset	sel(h)	AM	LM	N-gram	Sub	Del	Ins	Err
cr4+who	21.63	mpe.0	LM8	tg(12)cn	29.3	28.5	2.1	**59.9**
cr4+who	21.63	mpe.1	LM8	tg(12)cn	31.7	20.8	3.2	**55.6**
1we+cr4+who	147.66	mpe.1	LM8	tg(12)cn	25.2	19.2	2.3	**46.7**
1we+cr4+who	147.66	tandem-sat.1	LM8	tg(21)cn	21.7	15.6	2.4	**39.7**
1we+cr4+who	147.66	tandem-sat.1	LM17	tg(21)cn	20.5	15.3	2.3	**38.1**
1we+cr4+who	147.66	tandem-sat.1	LM17	fg(27)cn	17.8	16.3	1.9	**36.0**

- decoding was run on the manual segmentation, scoring was done considering the **manual devset**, excluding overlapping segments
- **LM8**: 4-gram interpolated LM combining 4 LMs (BBC-1week, BBC-radio4/tv-drama, BNE data, UW web data) pruned at $1.0e^{-9}$
- **LM17**: 4-gram interpolated LM combining 5 LMs (BBC subtitles(680M) minus 2M words from the month of May 2008 to avoid overlap with the 1 week dev data, BBC-1week, BBC-radio4/tv-drama, BNE data, UW web data) pruned at $1.0e^{-9}$

Example: Refined transcription trainset

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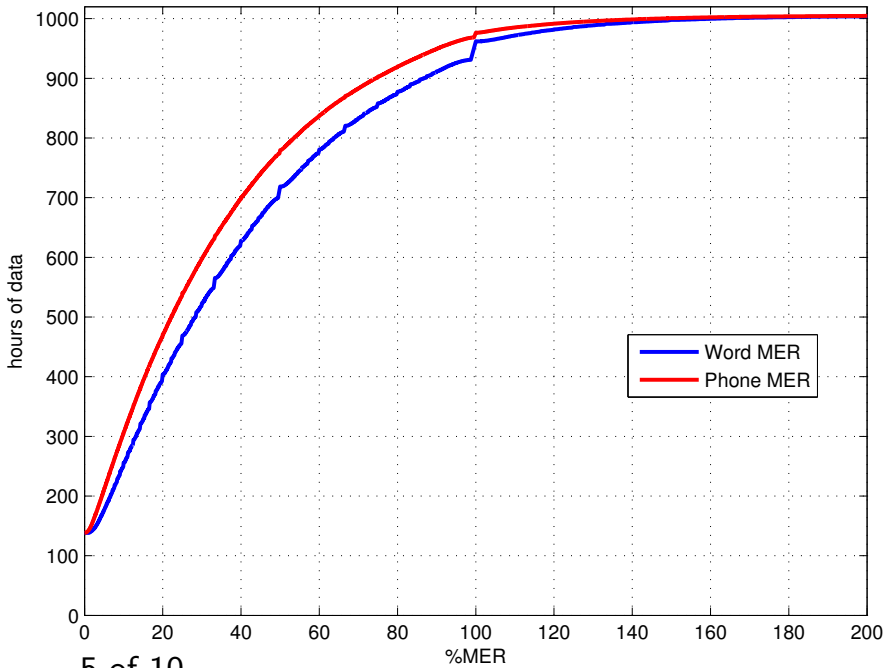
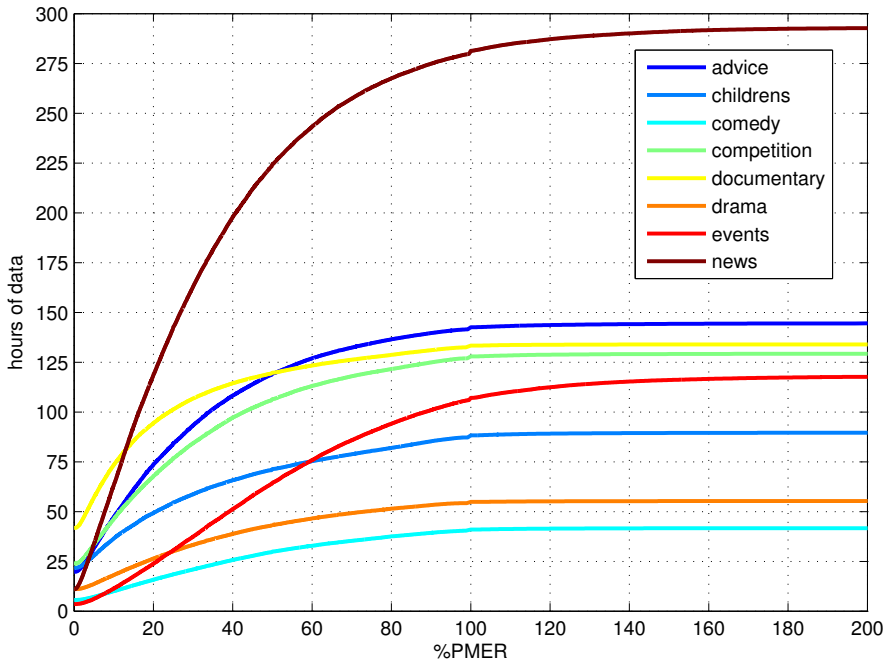
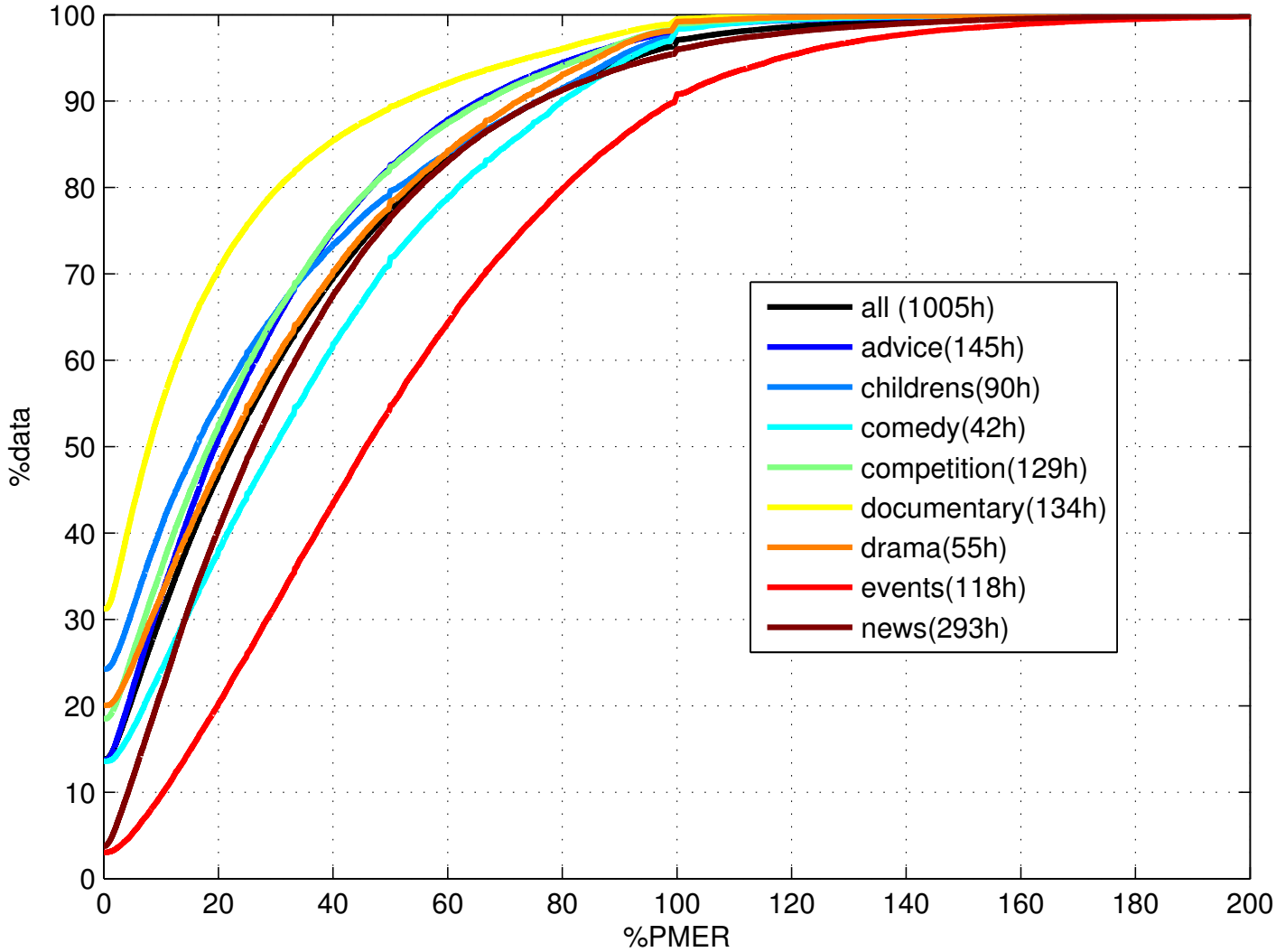
- 1197 hours of aligned transcripts/speech
  - **Matching Error Rate** (MER) used for **selection** of training data
  - *left*: cumulative duration(h) vs Word and phone MER
  - *right*: the cumulative duration(%) vs PMER for each genre: selection can be done by taking horizontal or vertical thresholds





Refined transcription trainset



Data Selection analysis per genre

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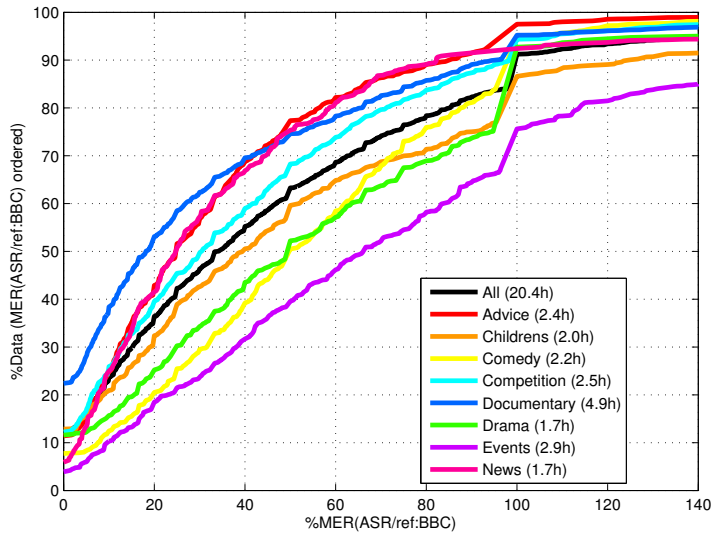
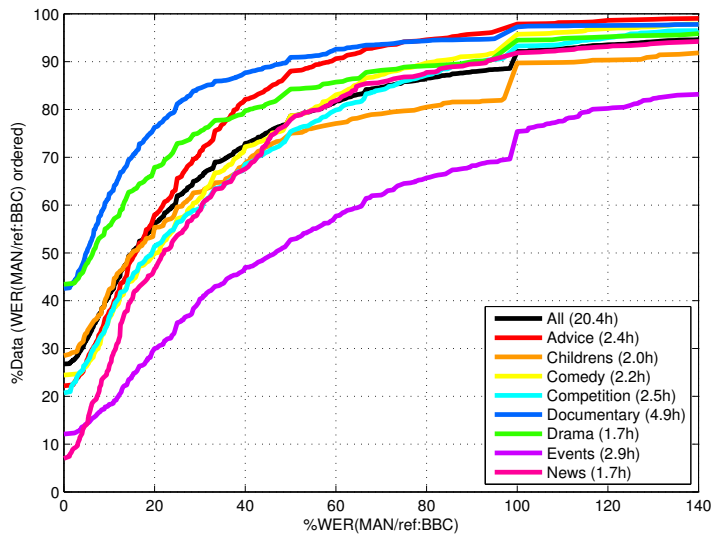
- We consider 8 primary genres extracted from json(infax)
  - advice, childrens, comedy, competition, documentary, drama, events, news
- in the previous experiment, we assumed that MER was representative of the quality of the transcript independently of the genre but is that really the case?
  - MER depends on the quality of the transcription but also on the performance of the AM
  - both can vary across genre
- we ran an data selection analysis per genre on the carefully transcribed dev data

Data Selection analysis per genre

- taking the BBC transcripts as reference, we plot the cumulative duration (%) given MER(ASRvsBBC) and WER(MANvsBBC)
  - left graph:
    - by comparison with the MER graph for the train dataset, we show that the devset is representative of the whole dataset in term of MER
  - right graph:
    - quality of the transcript depends on the genre (assuming MAN indep.)
    - MER & WER graphs have roughly the same shape: MER seems to be a good indicator of the quality of the transcript





Data Selection analysis per genre

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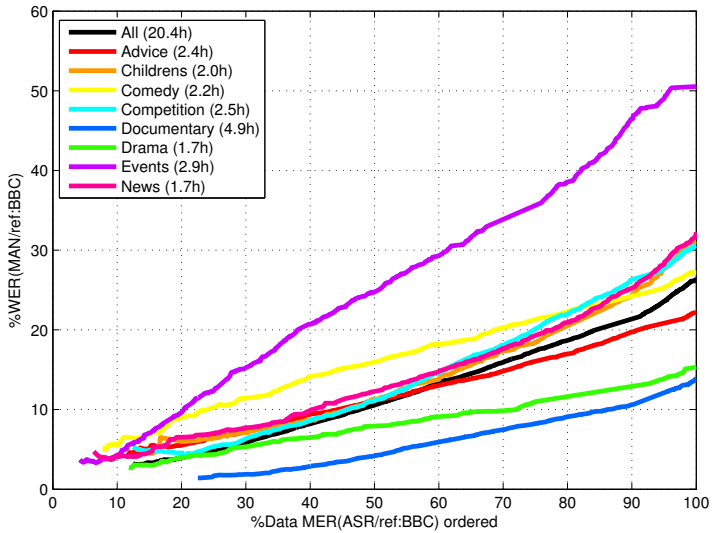
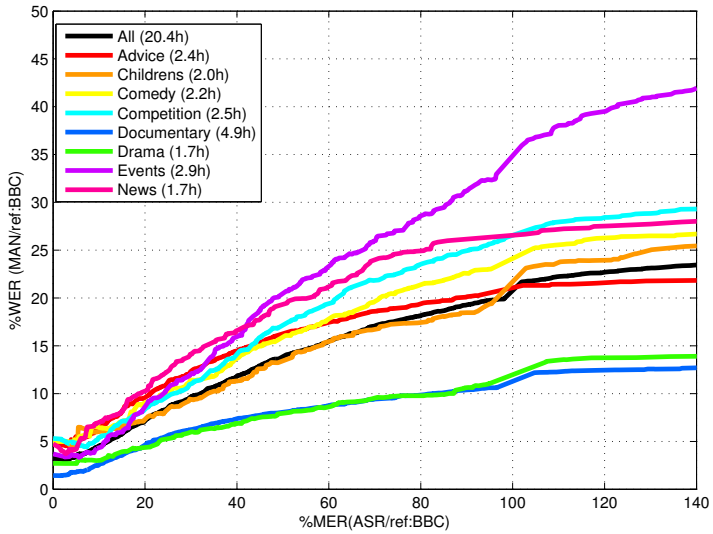
- Which transcript quality should we expect by doing a selection according to the %data (left graph) or to the %MER(right graph)?
- Selection threshold should depend on genre given that the dev set is representative of the whole dataset in term of transcription quality per genre (future experiments)





Sync Demo

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- Original subtitles might be imperfect
  - imprecise time stamps position, episode-specific lag
  - approximate transcription (re-speaking)
- We present the result of our alignment method based on a lightly supervised (LS) approach on 3 shows
  - `v20080609_223000_bbcfour_the_alan_clark_diaries` (drama) [-20:16]
  - `v20080628_191000_bbcone_doctor_who` (drama) [-25:10]
  - `v20080618_224500_bbcone_uefa_euro_2008_match` (sport event) [-35:38]

- in green: original subtitle
- in yellow: re-aligned subtitle (LS approach)
- in white: output of the LS decoding