Challenges for interpretability of speech models

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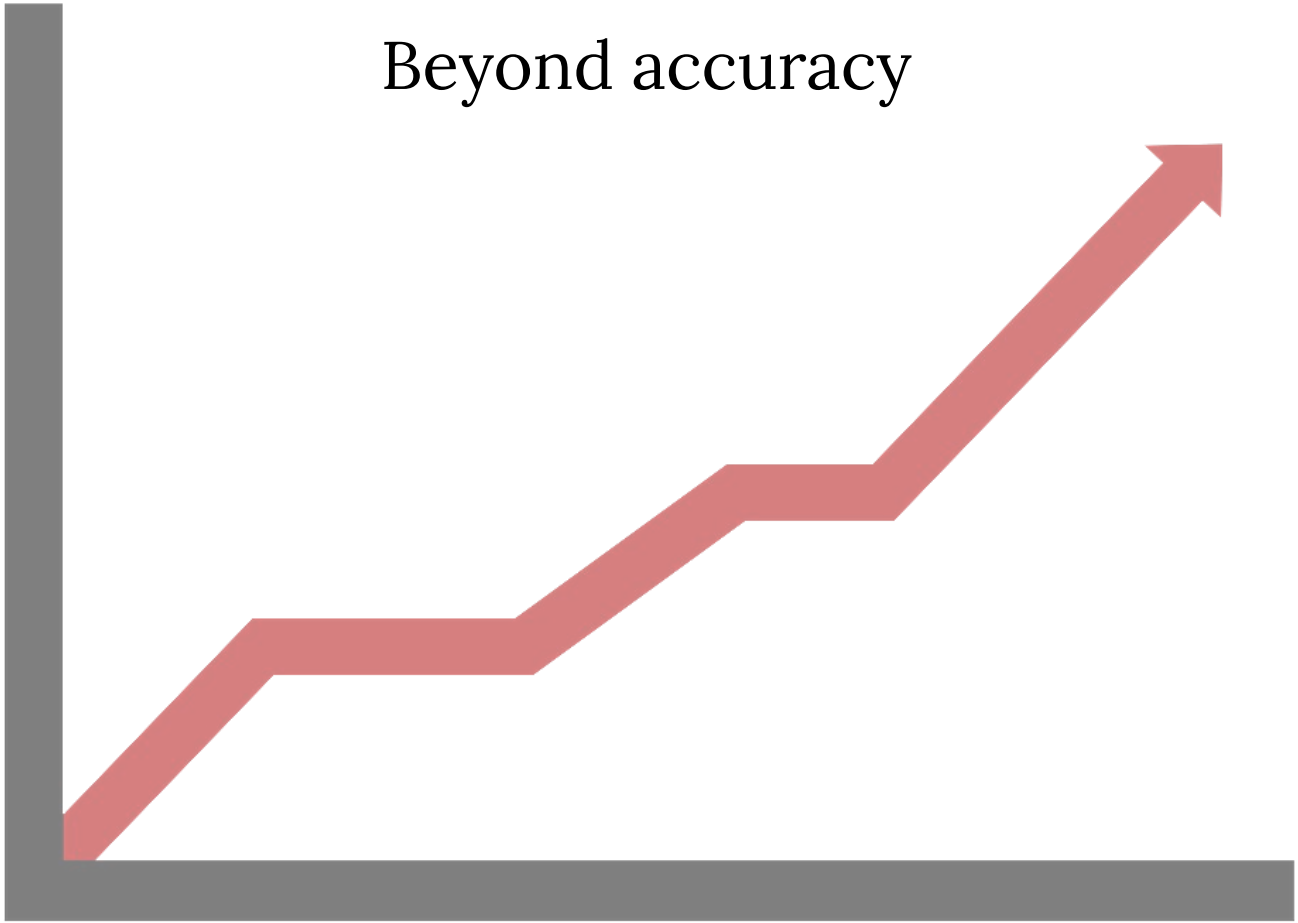
The growing importance of real world speech speech applications.

Beyond accuracy



What questions about models do we want to answer?

Modalities

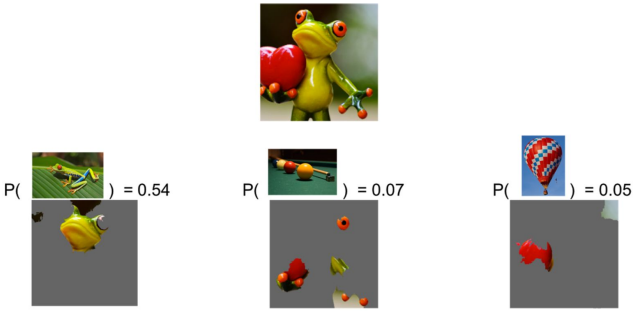
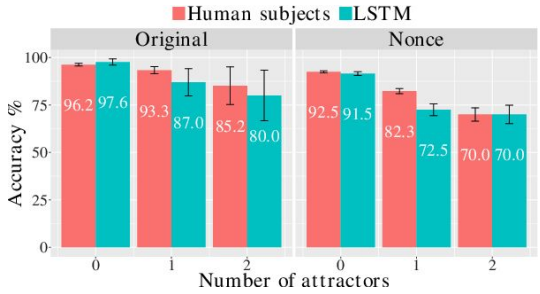
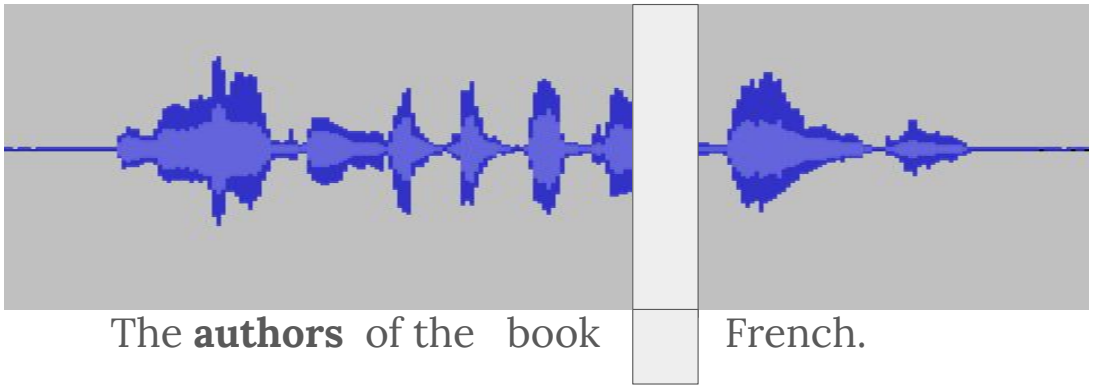
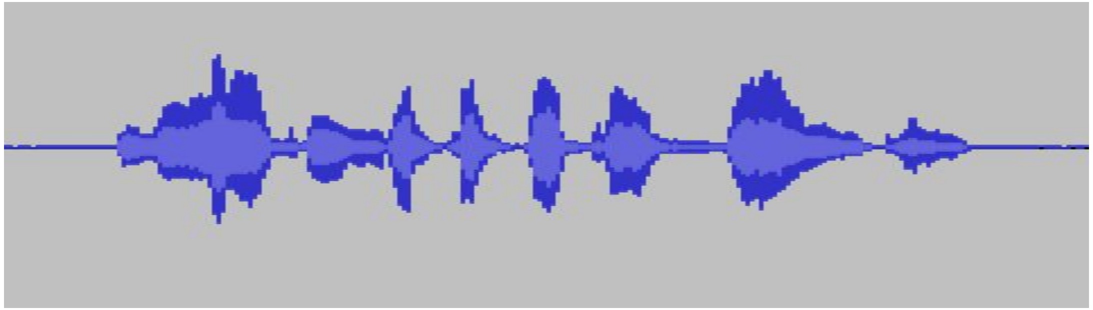


Figure 6. Explanation for a prediction from Inception. The top three predicted classes are "tree frog," "pool table," and "balloon." Sources: Marco Tulio Ribeiro, Pixabay (frog, billiards, hot air balloon).



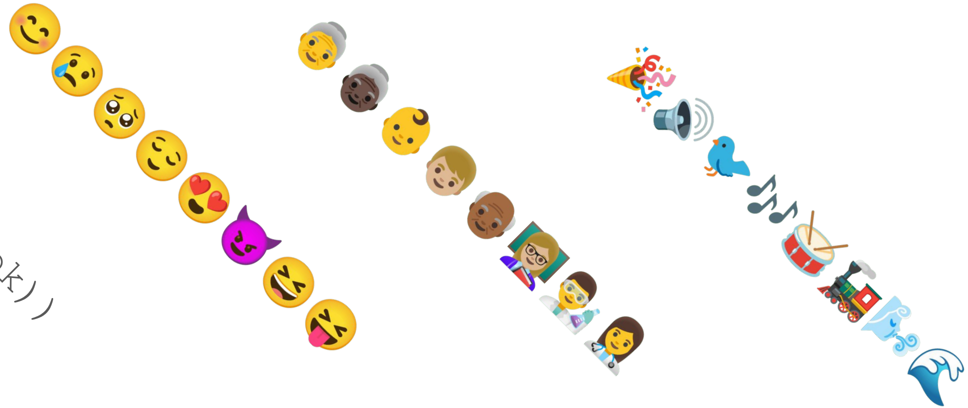
Yet the ratio of men who survive to the women and children who survive [is/are]

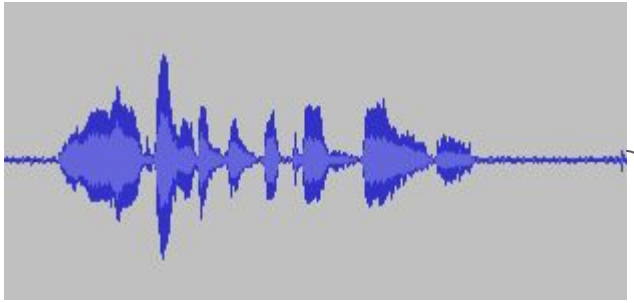


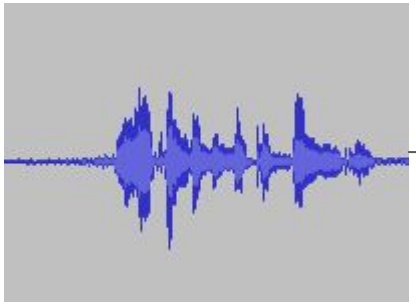


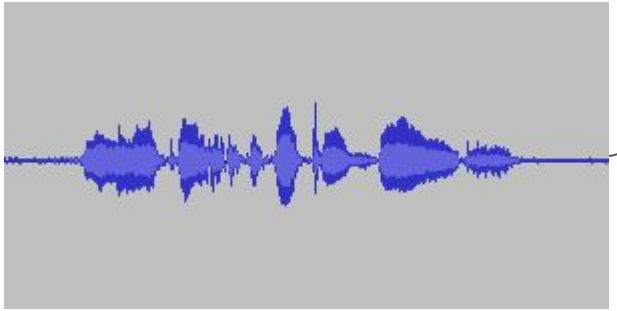
ðə ˈɔːθɚz əv ðə bʊk ɑɹ fɹɛntʃ

French (author (book))

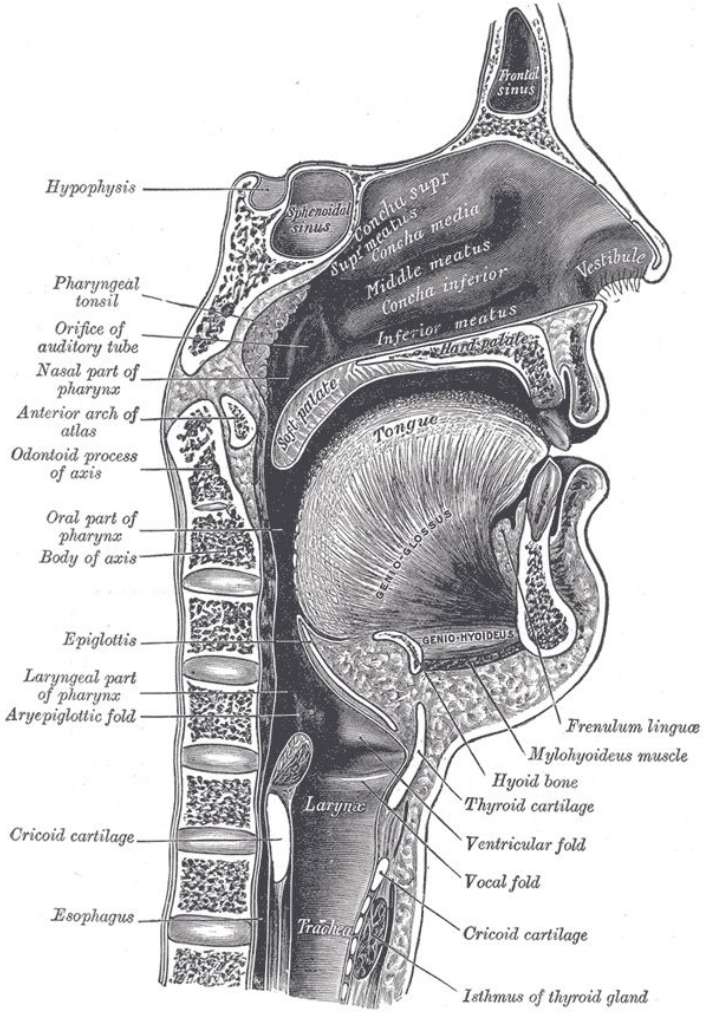








The authors of the book are French.



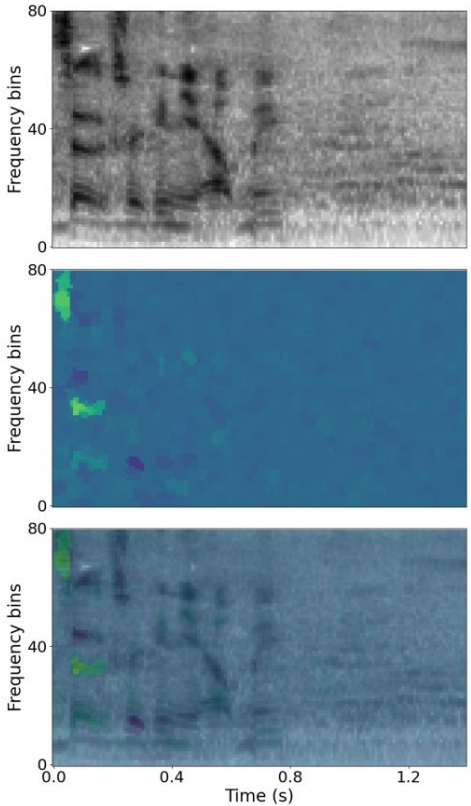


Figure 8: Example of saliency map (middle) for the token `so` (ASR), along with the corresponding spectrogram (top) and the map overlayed on the spectrogram (bottom).

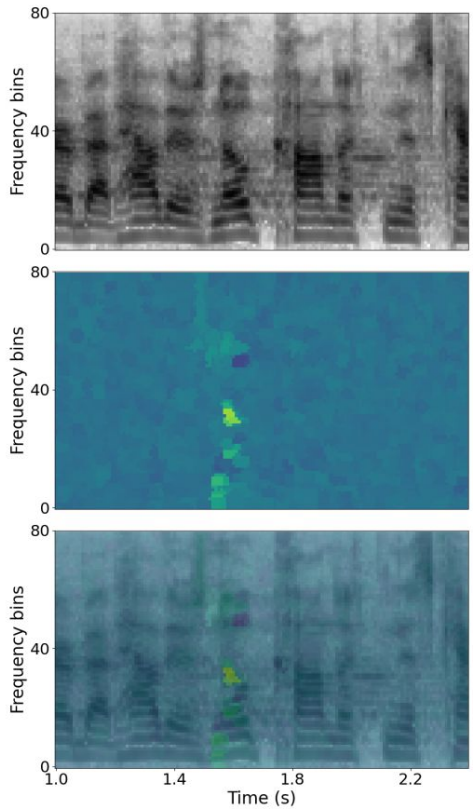


Figure 9: Example of saliency map (middle) for the token `no` (ASR), along with the corresponding spectrogram (top) and the map overlayed on the spectrogram (bottom).

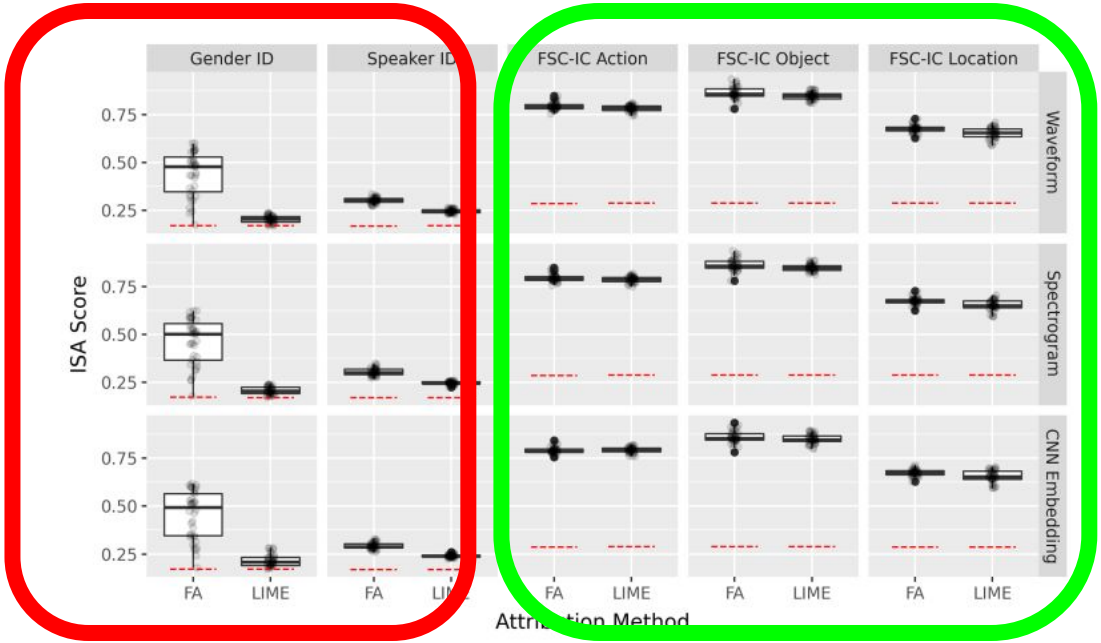


Figure 3: *Distributions of ISA scores with perturbation operating directly on word-aligned segments. The rows indicate different input feature types, the columns are different tasks. Within each panel, each boxplot report results from different attribution methods and the y-axis is the ISA score. The red dotted line indicates the randomly shuffled baseline. FA: Feature Ablation.*