

Frication and Voicing Classification

Luis M. T. Jesus¹ and Philip J. B. Jackson²

¹Escola Superior de Saúde da Universidade de Aveiro, and
Instituto de Engenharia Electrónica e Telemática de Aveiro
Universidade de Aveiro, 3810- 193 Aveiro, Portugal
e-mail: lmtj@ua.pt

²Centre for Vision, Speech & Signal Processing
University of Surrey, Guildford GU2 7XH, UK
e-mail: p.jackson@surrey.ac.uk

Notes

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- Results of plotting SOD versus UFD for all eight BE subjects, across all places of articulation showed that voiced fricatives lie on the SOD axis, unvoiced lie on the UFD axis, and most of the data fall into the main area with some SOD and some UFD.
- The phonologically voiced and unvoiced fricatives tend to form two distinct clusters which are highlighted by the red and blue ellipses on those plots.

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- Unvoiced fricatives cluster around (20, 100) ms, and a high classification accuracy of the phonological categories can be achieved by thresholding at $UFD \approx 60$ ms
- Considering the automatic voicing classification, we see that the pattern is broadly consistent: SOD times have increased slightly at the expense of UFD.
- The output from the HMM annotation of states shows that the new clusters for unvoiced and voiced fricatives are centred at (10, 115) ms and (20, 50) ms respectively, suggesting a higher threshold $UFD \approx 70$ ms

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- Results of plotting SOD versus UFD for EP subjects, showed that the distributions are similar to those from the BE corpus, however there is greater overlap including a large number of phonologically voiced fricatives that were devoiced.
- This variability may be attributed to differences in annotation procedure and the more natural context of the EP tokens.
- We have demonstrated the use of HMMs to label voicing and frication features objectively on unseen test utterances.
- The method is evaluated against manual annotations and performs favourably.