Individualized feedback for lexical stress errors

Towards a CAPT system for French learners of German

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M.Sc. Thesis proposal Language Science and Technology

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Introduction

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language. (Duong et al., 2011).

Sitaram et al. (2011) says blah blah blah.

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Table 0.1: I made a table, isn't that awesome?

```
some stuff in a pretty table
```

Background



Computer-Assisted Pronunciation
Tutoring

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1.1 Pronunciation in foreign language teaching

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1.2 CAPT systems

1.2.1 Selecting errors to target

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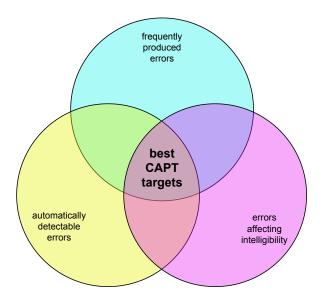


Figure 1.1: Criteria for selecting errors to target in a CAPT system.

- 1.2.2 Survey of existing CAPT systems
 - 1.3 The IFCASL project
- 1.3.1 Individualized feedback in CAPT?
- 1.3.2 The IFCASL corpus

Lexical stress errors for French learners of German

2

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

- 2.1 Frequency of production
- 2.1.1 Prosody of German vs. French
- 2.1.2 Lexical stress errors in the IFCASL corpus
 - 2.2 Impact on Intelligibility
 - 2.3 Automatic detection

System description



Diagnosis of lexical stress errors

3

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

- 3.1 Related work
- 3.2 Automatic segmentation of nonnative speech
- 3.2.1 System description
- 3.2.2 Evaluation of system accuracy
- 3.2.3 Coping with segmentation errors
 - 3.3 Prosodic analysis
- 3.3.1 Pitch
- 3.3.2 Duration
- 3.3.3 Intensity
 - 3.4 Comparison of native and nonnative speech

3.4.1 Using a single reference speaker

Manually selecting a reference

Automatically selecting a reference

3.4.2 Using multiple reference speakers

Feedback on lexical stress errors

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

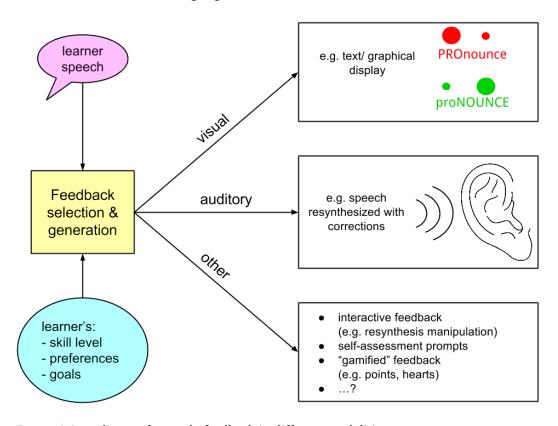


Figure 4.1: Delivery of prosody feedback in different modalities.

4.1 Related work

4.2 Visual feedback

- 4.2.1 Stylized text
- 4.2.2 Graphical representations of prosody
- 4.2.3 Visualizations of the speech signal
 - 4.3 Auditory feedback
- 4.3.1 Enhanced reference utterance
- 4.3.2 Resynthesized learner speech
 - 4.4 Alternative feedback types
- 4.4.1 Metalinguistic feedback
- 4.4.2 Interactive feedback
- 4.4.3 Implicit feedback

Conclusion and outlook

IV

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

Bibliography

Duong, Minh, Jack Mostow, and Sunayana Sitaram (2011). "Two methods for assessing oral reading prosody". In: *ACM Transactions on Speech and . . .* 1.212.

Sitaram, S, J Mostow, Y Li, A Weinstein, D Yen, and J Valeri (2011). "What visual feedback should a reading tutor give children on their oral reading prosody?" In: *SLaTE*.