EBERHARD KARLS UNIVERSITÄT TÜBINGEN

LEAD Graduate School & Research Network

COAST – Customizable Online Syllable Enhancement in Texts: A flexible Framework for Automatically Enhancing Reading Materials

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About

Provides customizable web-based text enhancement facilities
Targets learning therapists & teaching practitioners
Generates enhanced reading materials for (dyslexic) children

Features

- Automatically enhances syllable boundaries and word stress
- Flexible customization settings and template management
- Allows manual corrections of analyses by users
- Allows for collaborative improvement of the database by users

Background and Motivation

Dyslexia affects 4 – 8 % of the German population [1]

- One major cause: deficient phonological awareness [2]
- Impaired syllable stress detection strongly predicts dyslexia [3;4]
- Syllable synthesis and analysis essential for evidence-based reading training [5;6;7]

Input Enhancement

- In SLA input enhancement [8] used to facilitate *noticing* [9]
- Visual *text enhancement* facilitates reading [10;11;12]
  - e.g. font, colors, spacing

Incorporation of User Expertise

Requirement analysis (N=4)

- Expert interviews with learning therapists before system design
- Requested incorporation of user expertise:
  - In-tool option for manual adjustment of automatic analysis
  - Utilization of user knowledge for system improvement
- Implemented as local database updates
- Prompt user community to verify local entries for global updates

Usability Evaluation with User Tests

Sample (N=7)

- 3 experts, aged 40 to 51
- 4 laymen, aged 22 to 27

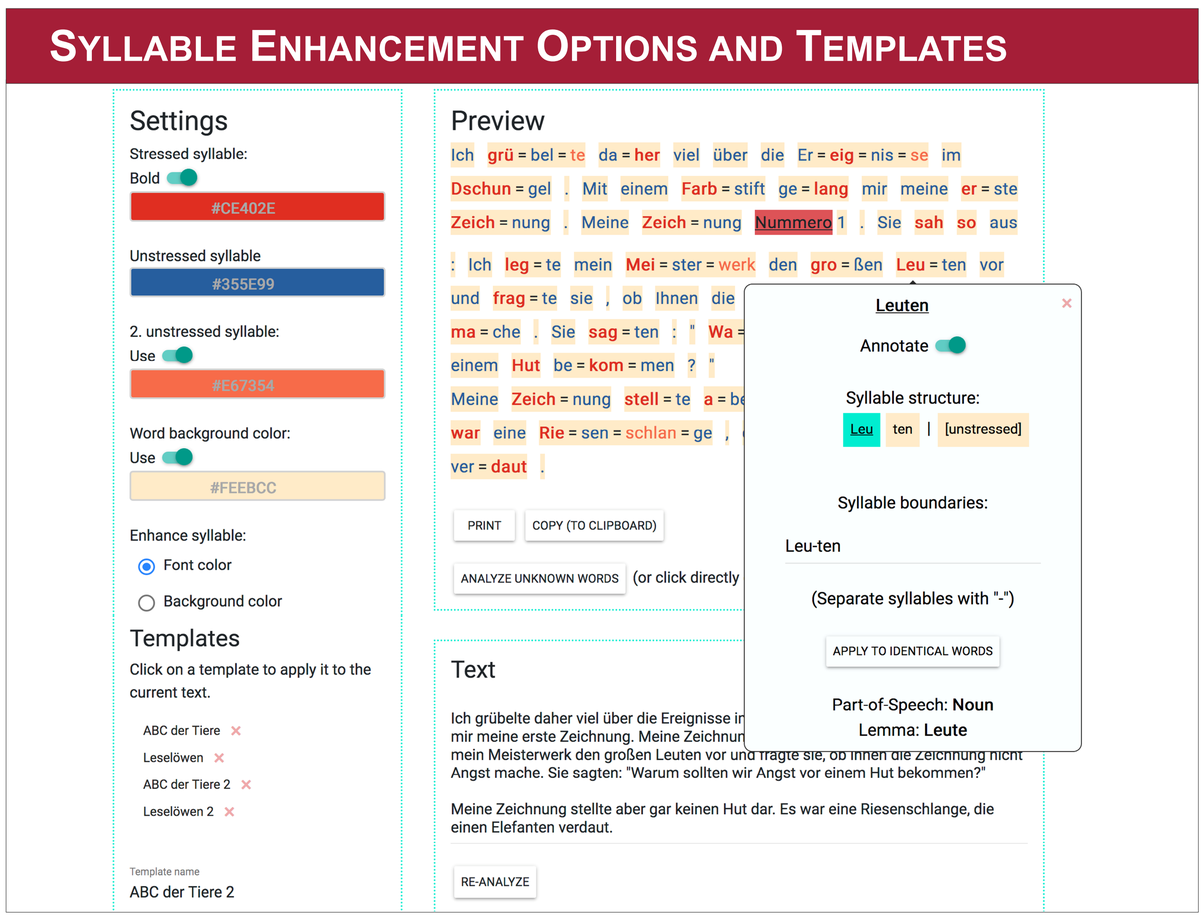
Method

- Think aloud study
- After scenario questionnaire
- Likert scale (strongly agree – strongly disagree)

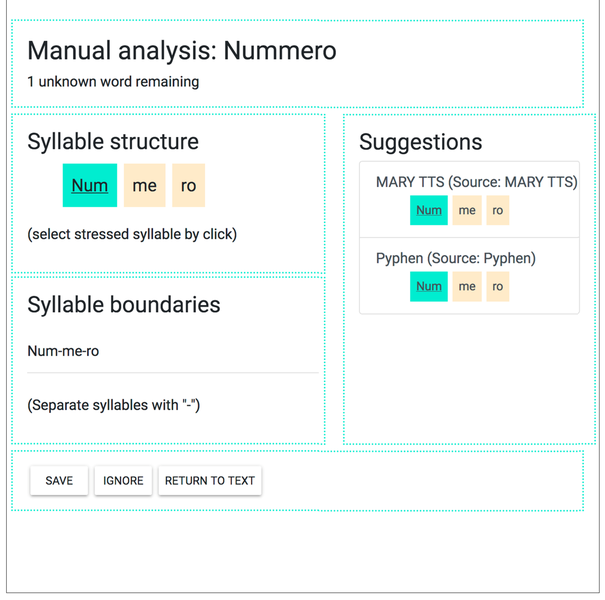
Scenarios

1. Text analysis and enhancement
2. Annotation and enhancement template
3. Verification of user-generated entries

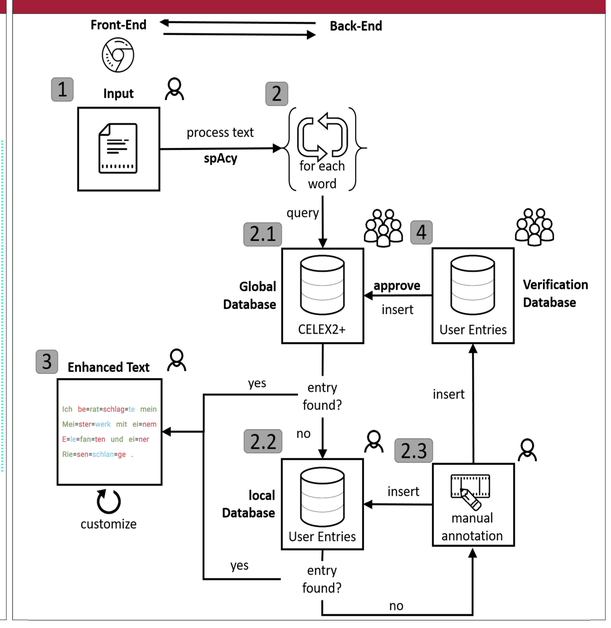
Syllable Enhancement Options and Templates



Verification View



COAST Workflow



Conclusion

- Highly flexible system for customized text enhancement
- Designed in close collaboration with teaching practitioners
- Current version successfully evaluated in user tests
  - Successfully annotates texts automatically
  - Allows to customize texts flexibly and time efficiently
- Learns from user input to improve future analyses
  - Includes user annotations to local database for re-use
  - Uses crowd to verify user entries to update global database

Outlook

- Add features requested in think aloud study
- Re-design visual appearance
- Deploy COAST to learning facilities
- Development of the accompanying *COAST App*
  - Tutoring system featuring exercises for learners
  - Optimized for mobile devices

Literature

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