Creating Macaronic Interface for Language Learning
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RESEARCH GOAL
• Investigate the feasibility of using Macaronic Text to assist language learning.
• Macaronic: mixture of native language (L1) with second language (L2).
• Present a learner with appropriately leveled macaronic text to allow them to read and learn new vocabulary and simple linguistic structures.
• Examples: The Police verhaftete the criminals. Die Polizei verhaftete die Straftäter.

TASK & REQUIREMENTS
• Automatically generate macaronic text from monolingual (L2) content.
• Generate full spectrum of macaronic states.
• Provide a learner with the ability to explore and interact with the macaronic content.

MACARONIC INTERFACE INTERACTION
• A Learner can interact with and explore the text via two main actions: Translation and Reordering.

MACARONIC TEXT GENERATION
• Moses (Koehn et al., 2007) was used to translate L2 content to L1 with associated word alignments.
• Alignments were converted to Minimal Alignments i.e. 1-to-1, 1-to-many, or many-to-1, with no null alignments.
• Minimal Alignments ensure consistent reversibility of actions.
• Alignments form small connected components called Units.

A unit forms a bipartite graph; the language of the words (which form nodes) defines two disjoint sets.
Macaronic sentences can then be produced by selecting the display language for each unit.

Reordering is handled by changing the unit order of the macaronic sentence.
Possible orderings for a sentence pair are defined by a bracketing ITG tree (Wu, 1997)
Translation and Reordering act independently, which allows for a large space of macaronic states to be displayed.

FUTURE WORK
• Reduce translation errors that result in poor quality macaronic sentence.
• Address issues with cross-linguistic divergence (Dorr, 1994).
• Provide ability for sub-word exploration and more interaction refinements.
• Integrate macaronic interface with continuously updated model of learner’s comprehension (Renduchintala et al. 2016).

ADDITIONAL FEATURES
• Slider Feature: An alternate version of the UI allows a learner to control a slider, which changes the “macaronicity” of the displayed content in real-time.
• Pop Quiz Feature: Occasionally, when a learner requests a translation action from German (L2) to English (L1), the system responds with a “Pop Quiz.” The learner is prompted to guess the translation. Once a guess is entered, the system scores the guess and gives the learner feedback.

This feature allows the system to update its model of the user’s comprehension of macaronic sentences.

REFERENCES