“Best Song So Far”

Composers: Pop* and Lyrist
Metamusicians: Paul Bodily, Ben Bay, and Dan Ventura
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Description of the Work

Pop* (pronounced Pop-Star) is an automated pop lead sheet generator. It uses a modular framework to generate verse-chorus structure, rhyme-scheme, lyrics, harmony, and melody. The lyrical module, which we call Lyrist, functions as a stand-alone lyric generation system. Pop* and Lyrist work in concert to create novel full-length pop songs in lead sheet format on their own with no external input (beyond an inspiring set of pop music and lyrics). To concretely render compositions, we generate both printed sheet music and MP3 audio recordings. MP3 audio files feature computer-sung lyrics accompanied by synthesized piano and bass comping chords.

Technical Description

Pop* uses a hierarchical Bayesian program learning model, meaning that the concept of a pop composition is factored into subconcept models such as verse-chorus structure, rhyme-scheme, lyrics, harmony, and melody. These subconcepts are further factored until subconcepts represent simple enough ideas to be approximated using data-driven (conditional) probability distributions. Generation of novel compositions is achieved by combining subconcept values as they are probabilistically sampled from subconcept distributions.

Lyrist represents a subconcept model of lyrics (conditioned on melody and intention). Pop* creates lyric templates by recombining lyrical phrases from existing songs. These templates serve as input to Lyrist which intelligently replaces words in the template to create new lyrics. Lyrist uses word embedding (i.e, a numeric vector which represents the semantic meaning of a word), vector operations, and constraint (e.g., rhyming and part-of-speech) filters to generate novel lyrics that evoke an intended theme and rhyme structure.

More complete descriptions of these systems will be found in the proceedings of ICCC 2017 and MUME 2017.

Performance Requirements/Link to Online Recordings

We will show a video in which a pop song pre-composed by Pop* and Lyrist is heard and the corresponding section of the lead sheet is visualized. For an example composition see **https://paulbodily.blogspot.com/2017/04/pop-and-lyrist-debut.html**. We will need to stream the video from a web browser at the concert either using a provided computer or our own.

Biography

Paul Bodily is a PhD candidate in the CS department at Brigham Young University (BYU). Under the advisement of Dr. Dan Ventura, his research focuses on machine learning in pop music with the intent of building data-driven generative systems.

Ben Bay is an undergraduate research assistant pursuing his B.S. in CS at BYU. Under the advisement of Dr. Dan Ventura and mentorship of Paul Bodily, his research focus is on systems that generate lyrics.

Dr. Dan Ventura is a CS professor at BYU whose focus is on computational creativity systems generally. Students under his advisement have published systems in domains such as artistic image generation (DARCI), recipe generation (PIERRE), jazz lead sheet composition (CARL), and neology (Nehovah).