Augmenting Affect from Speech with Generative Music

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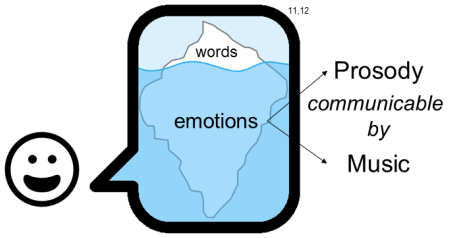
Motivation

Axioms:
- Verbal communication covers semantics & emotions
- Both are necessary to understand messages[5]
- Emotions are encoded in prosodic & spectral features of speech



Problem:
- Emotions in speech are crucial,
  - increase communication quality
  - and are not intelligible to impaired[4]

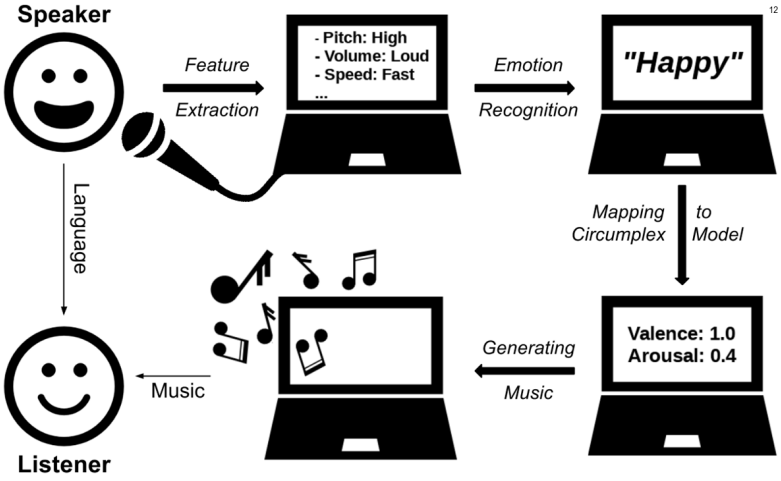
Solution:
- Music with same affect as speech
- *Different channel* for *same code*[3]

Prototype Definition

Goal:
- Generate music with same affect as speech
- Music production starts by talking

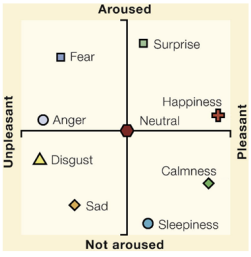
Techniques:
- Emotion recognition
  - from prosodic/linguistic & spectral/acoustic features
  - trained by emotional utterances
  - classifying with emotion labels
  - trained on Berlin-EMO / FAU-Aibo
- Affective music generation
  - transforms affect from Circumplex Model[6] to musical patterns

Prototype Illustration



Preliminary Results

Emotion Recognition:
- Done: Offline Classifier[9]
  - Accuracy: > 60–80% (without noise)
  - Detection speed: < 250ms (desktop)
  - Rate: > 20Hz (parallelized)
  - Still room for improvements …
- Open Tasks: Online Ability & Emotion Mapping



Circumplex Model[10]

Music Generation:
- Evaluated algorithms create music with determined affective expressivity[8]
- Valence & arousal values are mapped to several music parameters
- Music rules are found by Gomez et al[7]

Projected Evaluation

Research Interest:
- Is affect from speech and generated music perceived as congruent/familiar?
- Does generated music increase informative value of speech messages?

Type of Study:
- User Study with questionnaires
- Audio assessment by subjects

Test Scenario:
- Generate music to speech
- Speech: offline training data & online live stage from actor

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