MelTS is an automatic composition system that creates multi-part arrangements of a given melody line in the style of the data on which it was trained. The system was designed after machine translation systems following the idea that harmonizing a melody line in a given style is analogous to translating from source to target language.

**Abstract**

MelTS is an automatic composition system that creates multi-part arrangements of a given melody line in the style of the data on which it was trained. The system was designed after machine translation systems following the idea that harmonizing a melody line in a given style is analogous to translating from source to target language.

**Future Work**

- Incorporate additional features
  - chord predictions
  - distance from center of pitch range
- Train models on bigger granularity
- e.g. chord per melody phrase
- Try different decoding methods

**Benefits of Model**

- Focus is placed on quality of individual lines, in addition to quality of song as a whole
- Style is learned from data, not baked into composition algorithm
- Log-linear model can be extended to more features
- Borrows from an advanced field, meaning many possible routes for improvement

**Melody Translation System**

\[
H = \arg \max_H [w_0 L(H) + w_1 P_h(H) + w_2 N(H)]
\]

**Model Design**

- Model Generator
- Weight Trainer
- Decoder

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**Evaluation**

- Perplexity metric for model evaluation
- Theory scorers for compositions
- Non-expert ranking of compositions via Amazon Mechanical Turk

**System Design**

- Training Data
- Model Generator
- Weight Trainer
- Decoder
- Full Composition

**Optimization Data**

- Language Model
- Phrase Translation Model
- Note Translation Model

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