Muse2Bach

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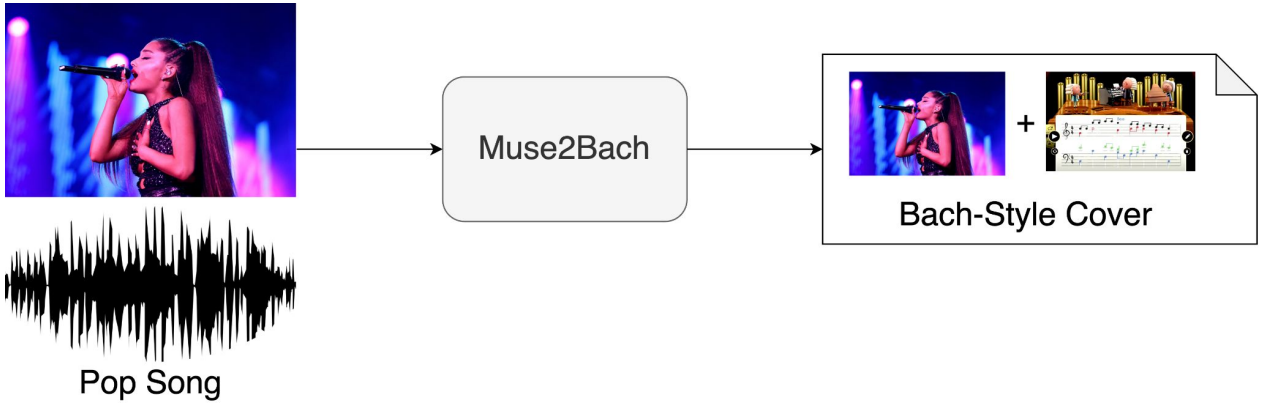
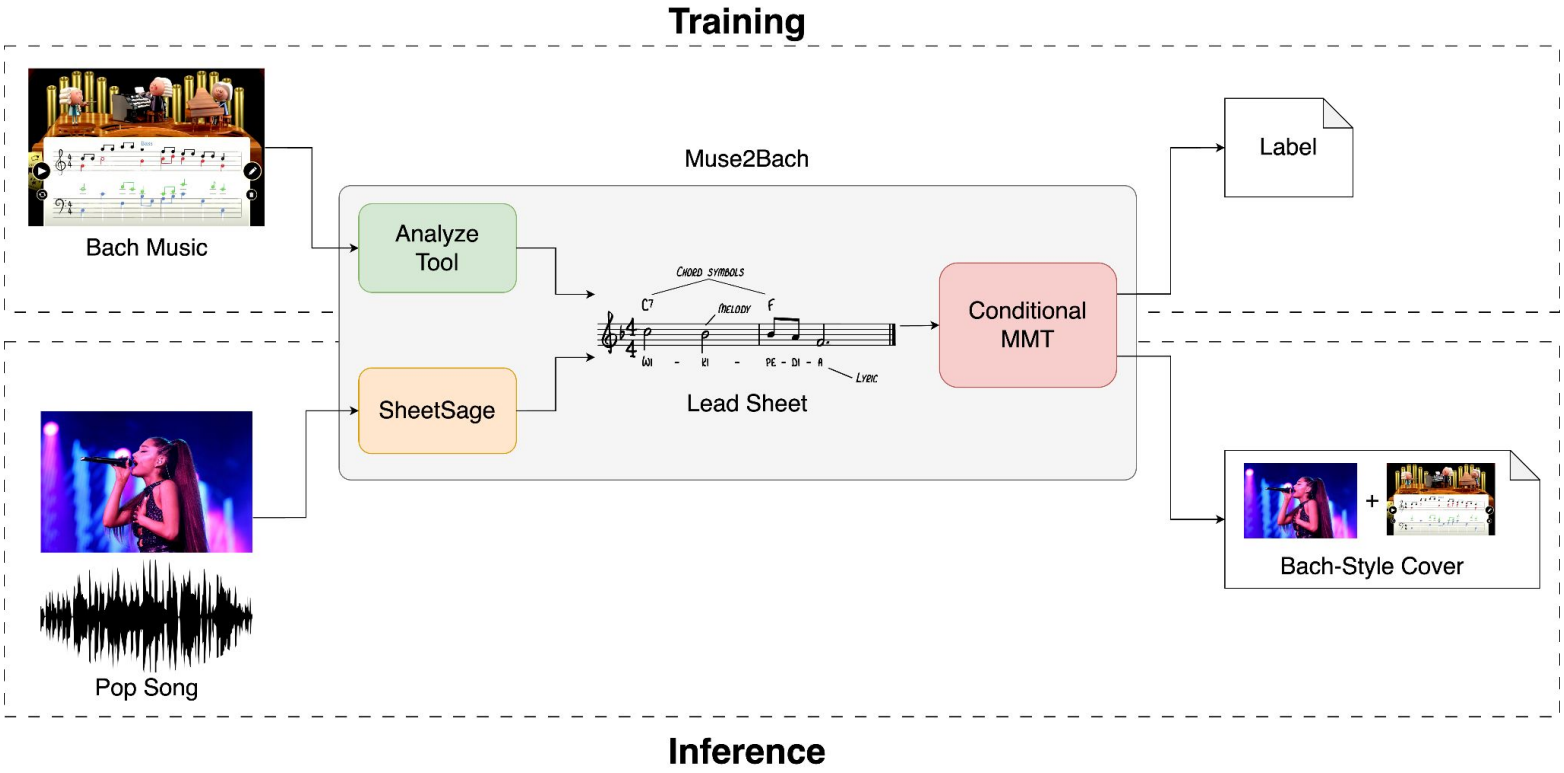
Muse2Bach

- Objective
  - Convert pop song to Bach-style cover (example)

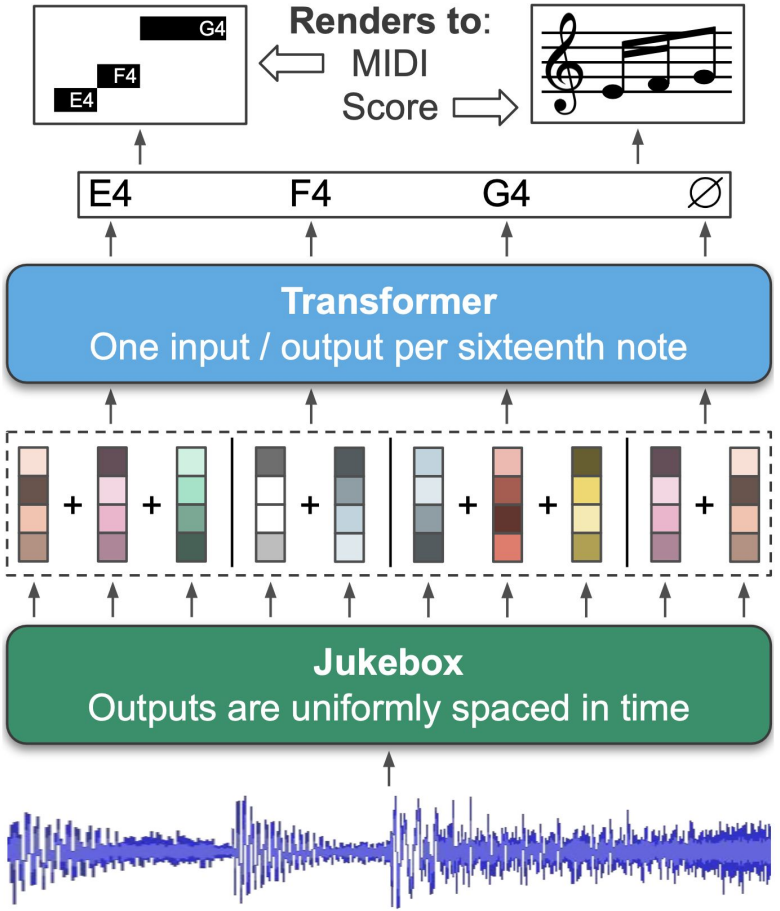


Mathodology



Model - SheetSage

- SheetSage
  - SOTA for lead sheet transcription
  - Take advantage of Jukebox prior

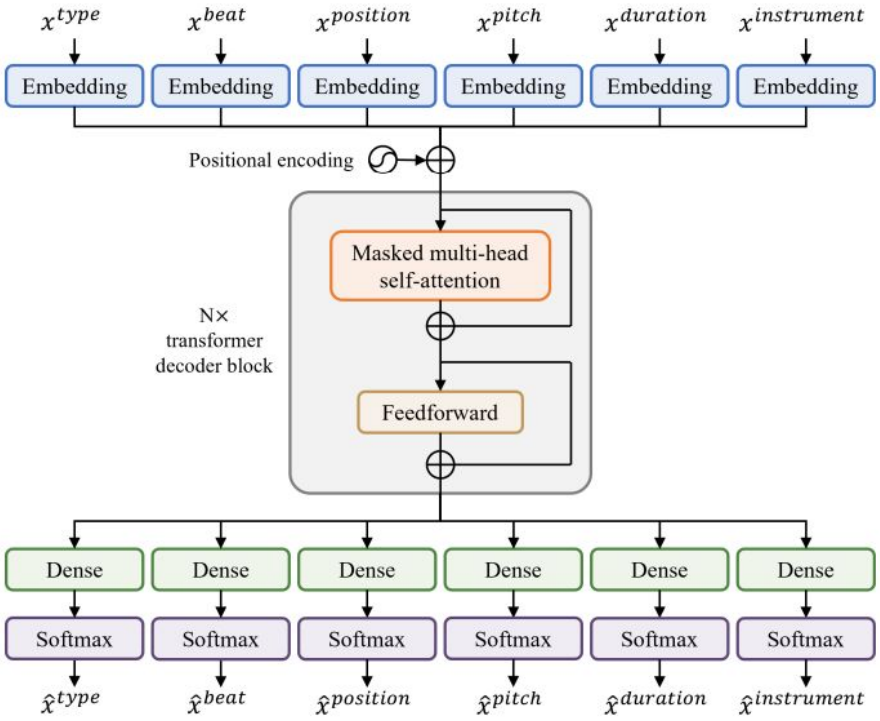


Model - Multi-track Music Transformer

- MMT
  - Model structure
  - MMT representation

Model	Multitrack	Instrument control	Compound tokens	Generative modeling
REMI [5]				✓
MMM [10]	✓			✓
CP [6]			✓	✓
MusicBERT [15]	✓		✓	
FIGARO [11]	✓			✓
MMT (ours)	✓	✓	✓	✓

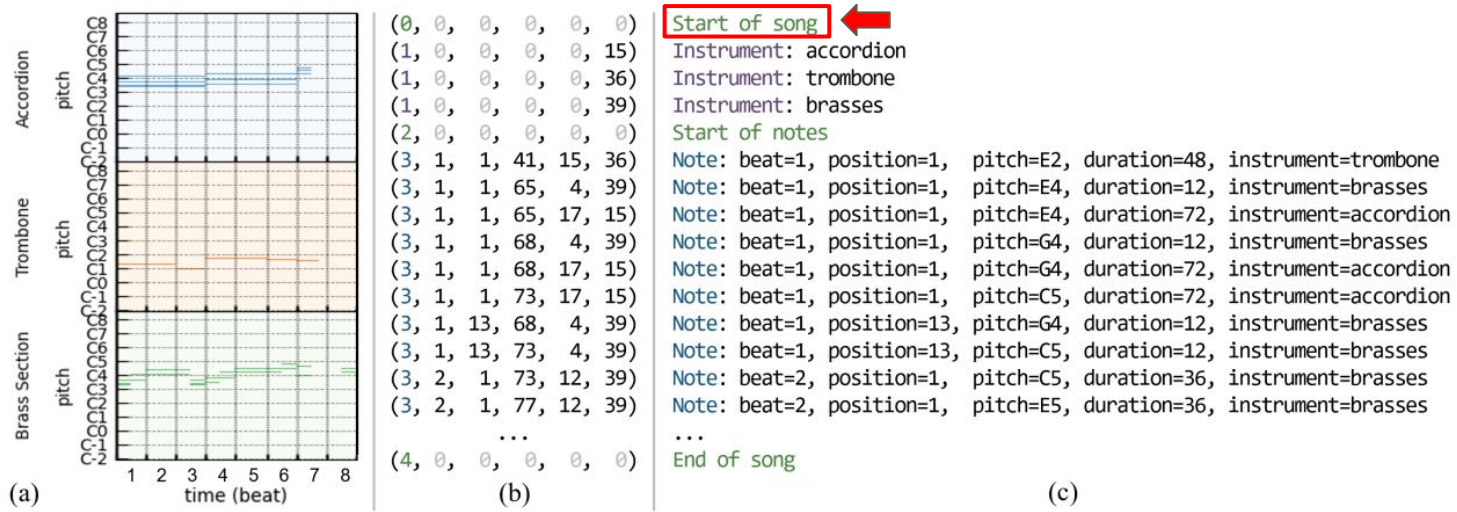
(Representation)



(Structure)

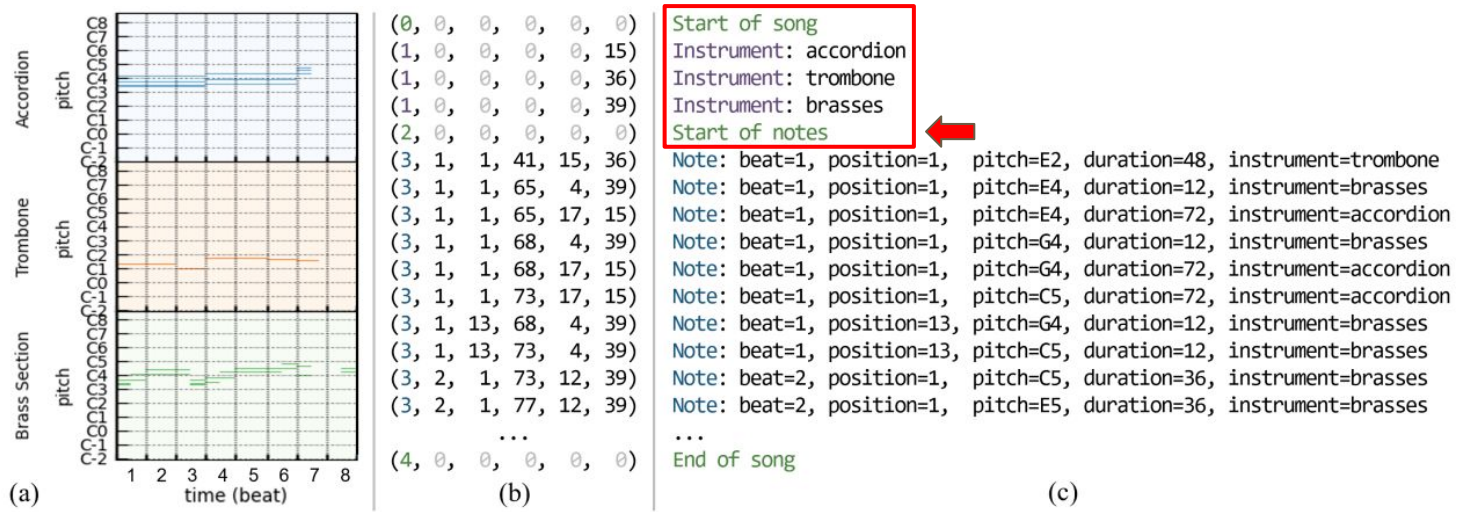
Model - Multi-track Music Transformer (cont.)

- MMT
  - Unconditioned generation
  - Instrument-informed generation
  - N-beat continuation



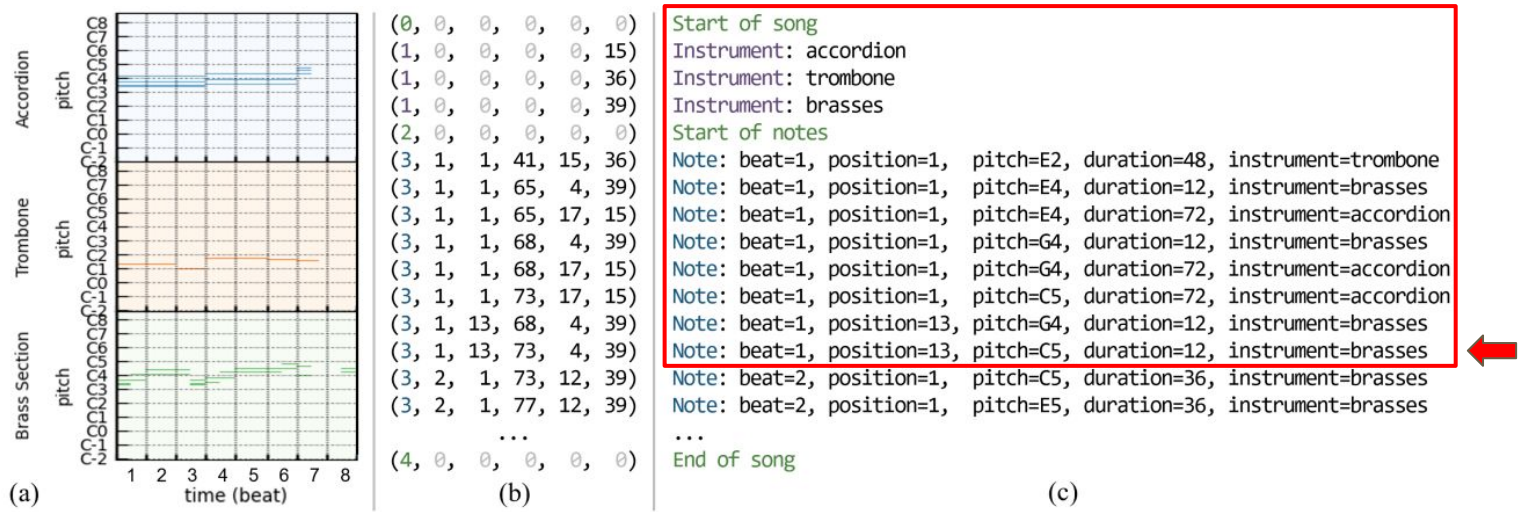
Model - Multi-track Music Transformer (cont.)

- MMT
  - Unconditioned generation
  - Instrument-informed generation
  - N-beat continuation

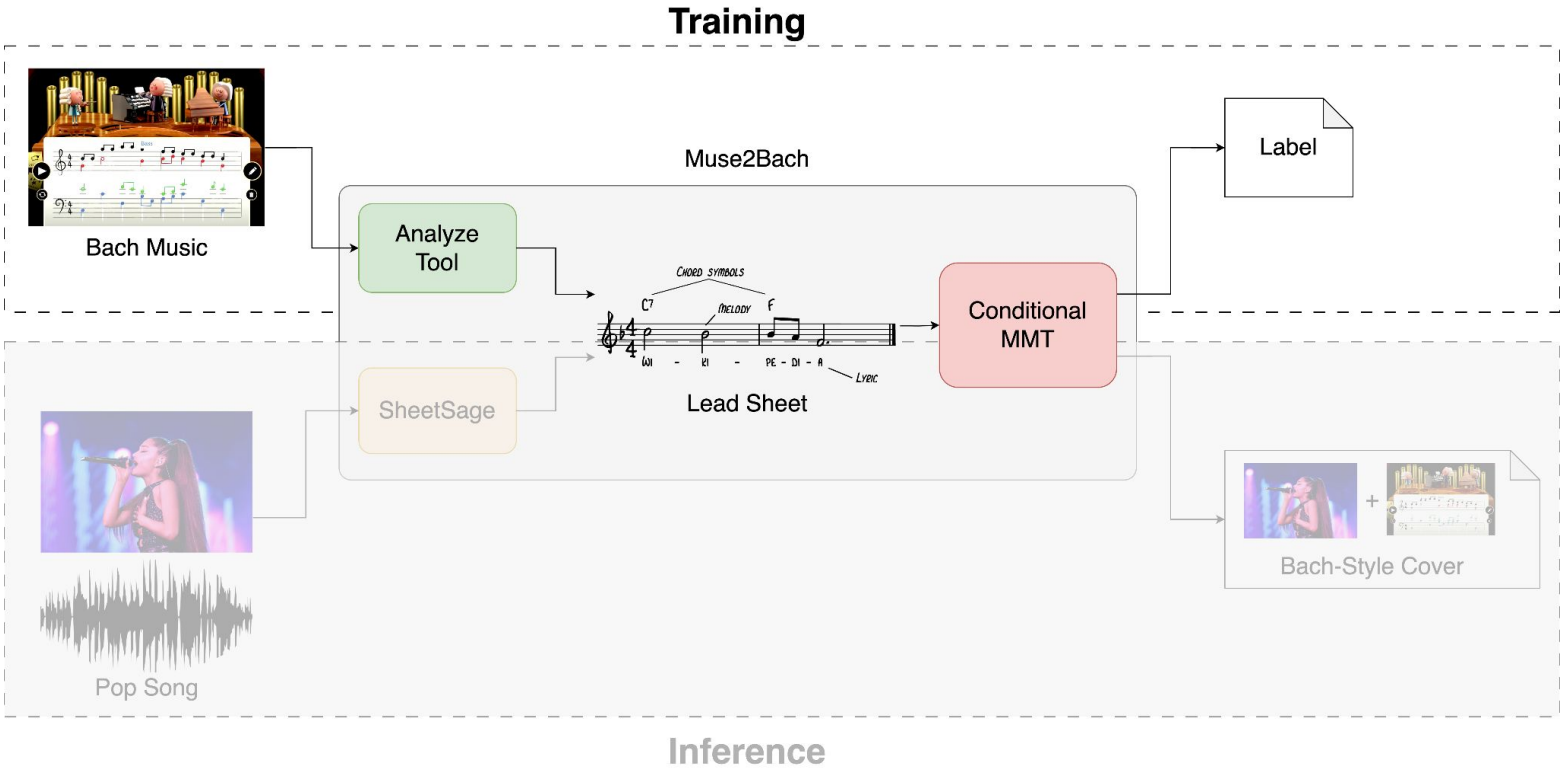


Model - Multi-track Music Transformer (cont.)

- MMT
  - Unconditioned generation
  - Instrument-informed generation
  - N-beat continuation



Tranining


Training
Bach Music
Muse2Bach
Analyze Tool
Label
Conditional MMT
SheetSage
Lead Sheet
Pop Song
Bach-Style Cover
Inference

Data

- Dataset: Chorale & Doodle
  - Doodle
    - user-entered melody + generated harmonization
    - random select 100000 segments with feedback = 2
    - 2 bars, four-part
  - Chorale
    - Bach four-part chorales
    - 189 full songs

Data (cont.)

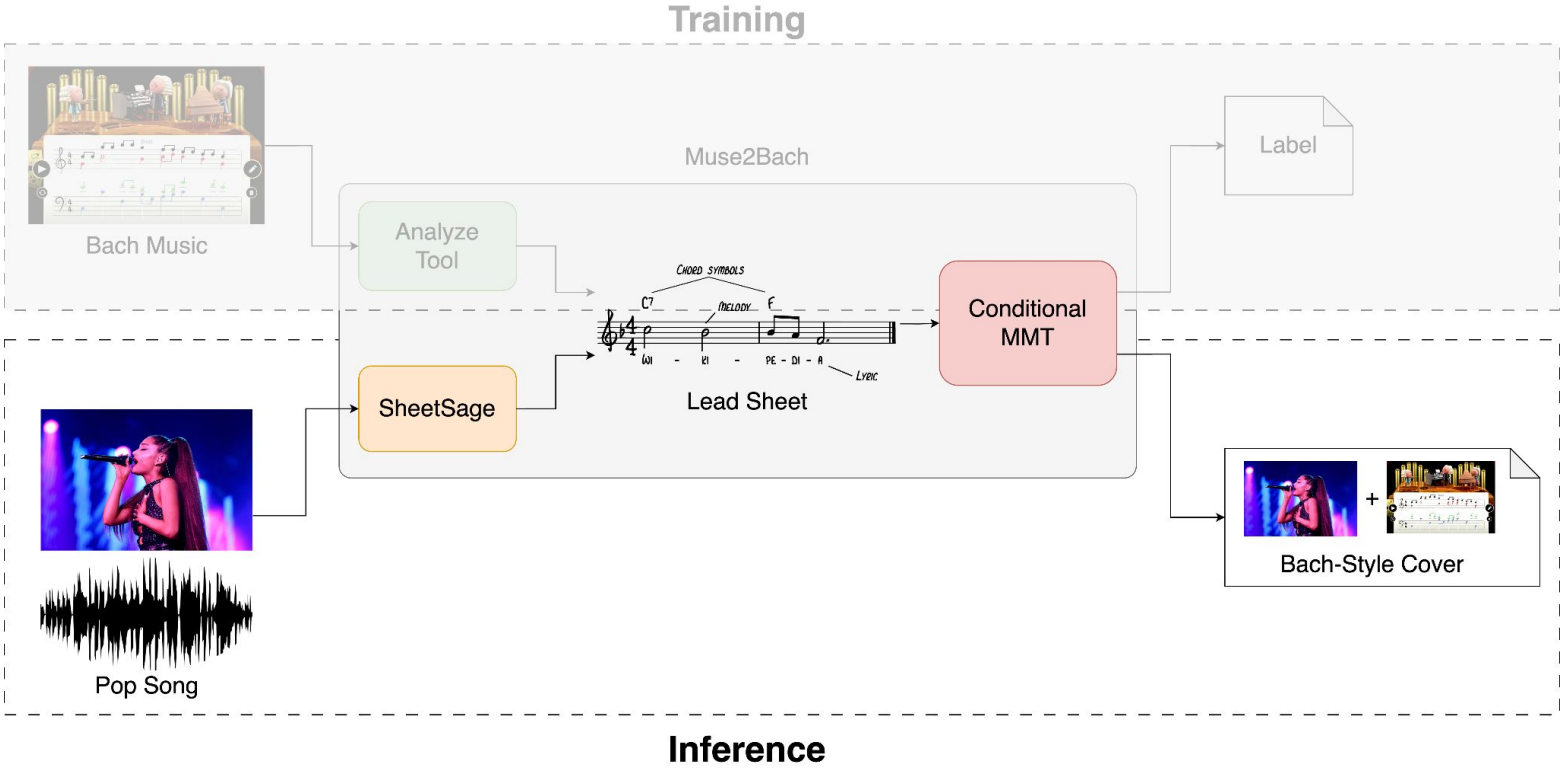
- Training details
  - Chorale
    - Chord
      early stop at 22000 steps
    - No chord
      early stop at 23000 steps
  - Doodle
    - Chord
    - No chord

- max input length = 1024
- embedding length = 512
- # of transformer layers = 6
- # of attention heads = 8
- batch size = 8
- drop out = 0.2
- training max step = 200000

- MMT Representation

$(x^{type}, x^{beat}, x^{position}, x^{pitch}, x^{duration}, \mathbf{x^{chord}}, x^{instrument})$

Inference


Training
Bach Music
Muse2Bach
Analyze Tool
Label
Chord symbols
C7
Melody
F
Lyric
Conditional MMT
SheetSage
Lead Sheet
Pop Song
Bach-Style Cover
Inference

Demo

Demo

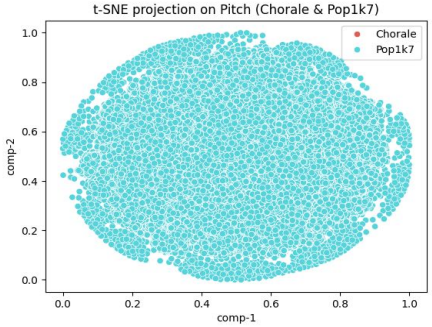
	OMG	Ditto	夜に駆ける
Chorale w/ chord			
Chorale w/o chord			
Doodle w/ chord			
Doodle w/o chord			

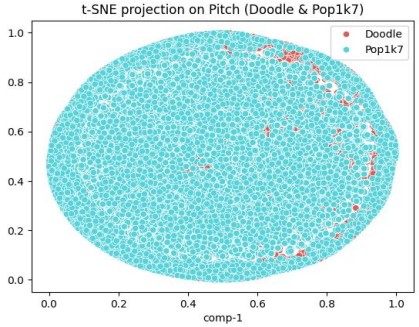
Discussion

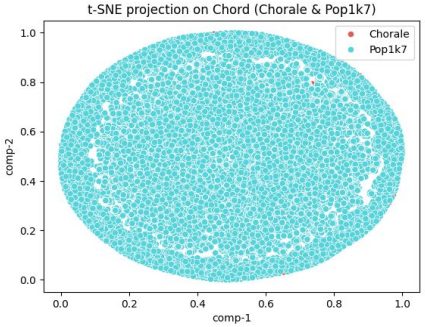
- 音樂差異
  - 巴洛克時代四部合聲 vs 現代流行樂

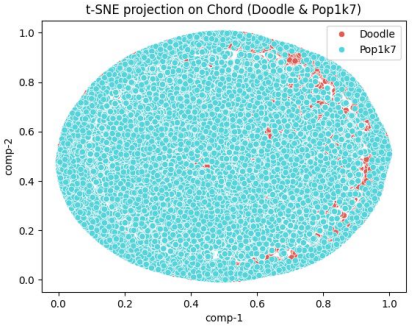
Discussion

- Dataset bias (bach vs Pop1k7) - t-SNE for melody & chord



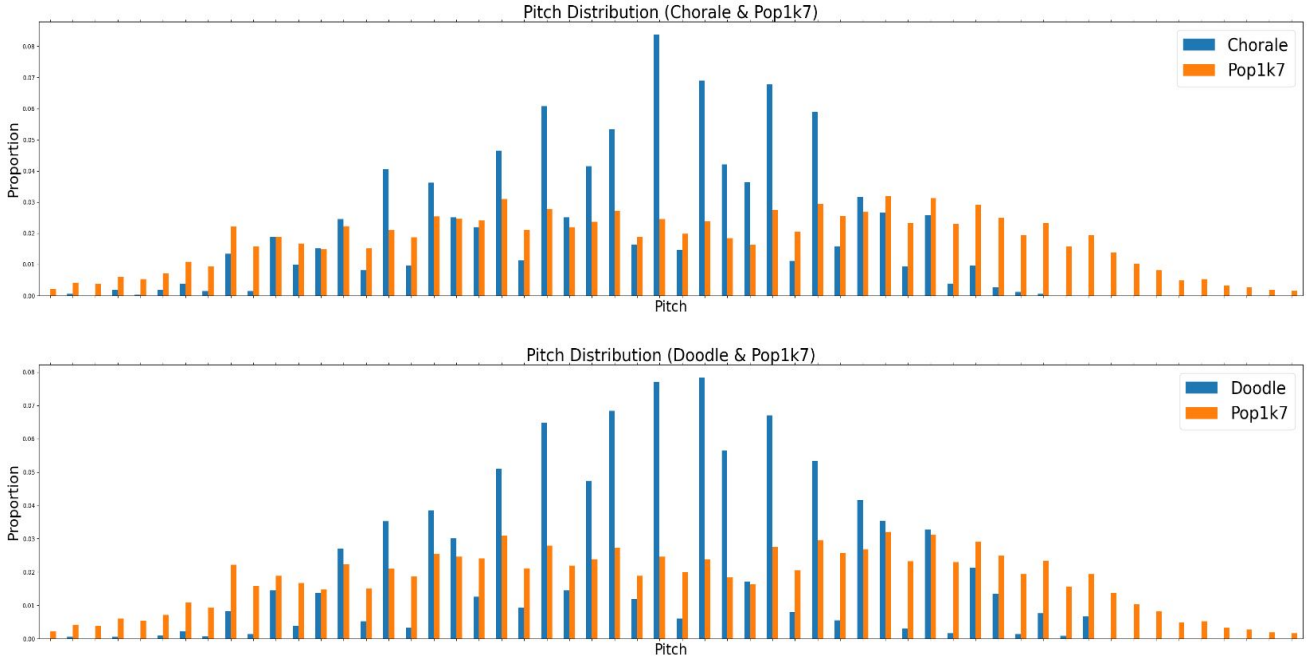






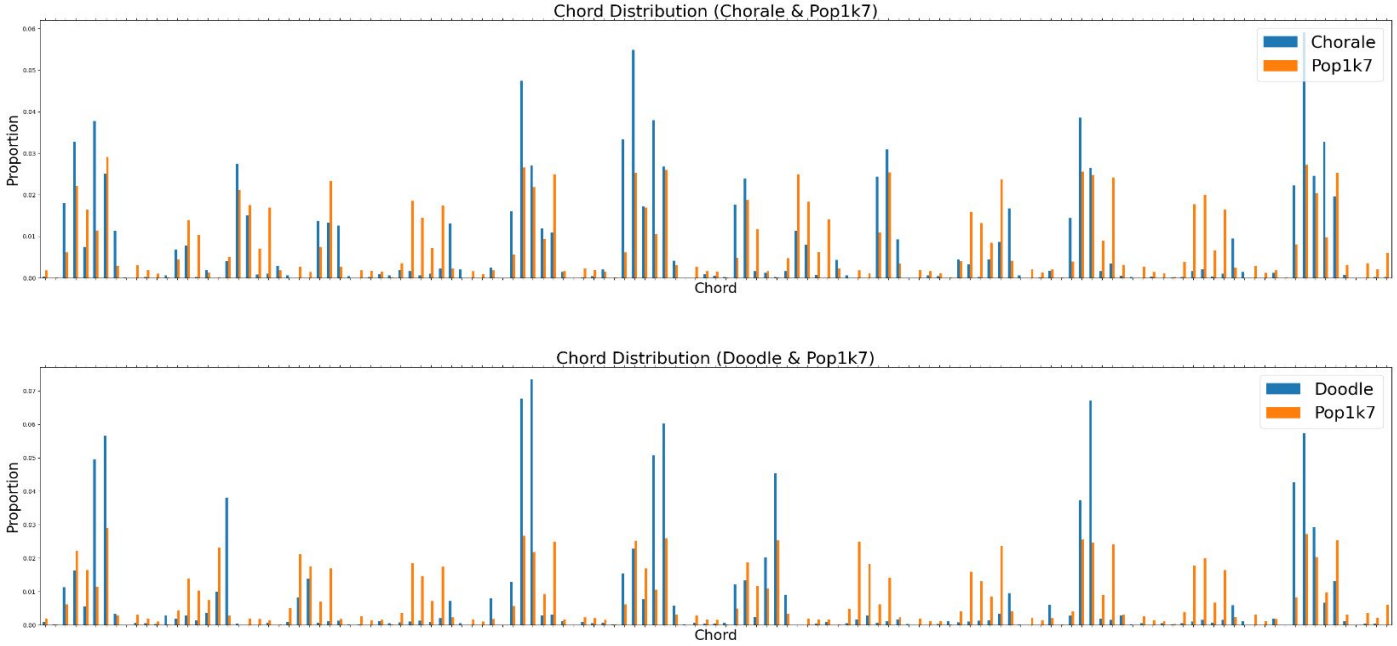
Discussion

- Dataset bias (bach vs Pop1k7) - Pitch Distribution



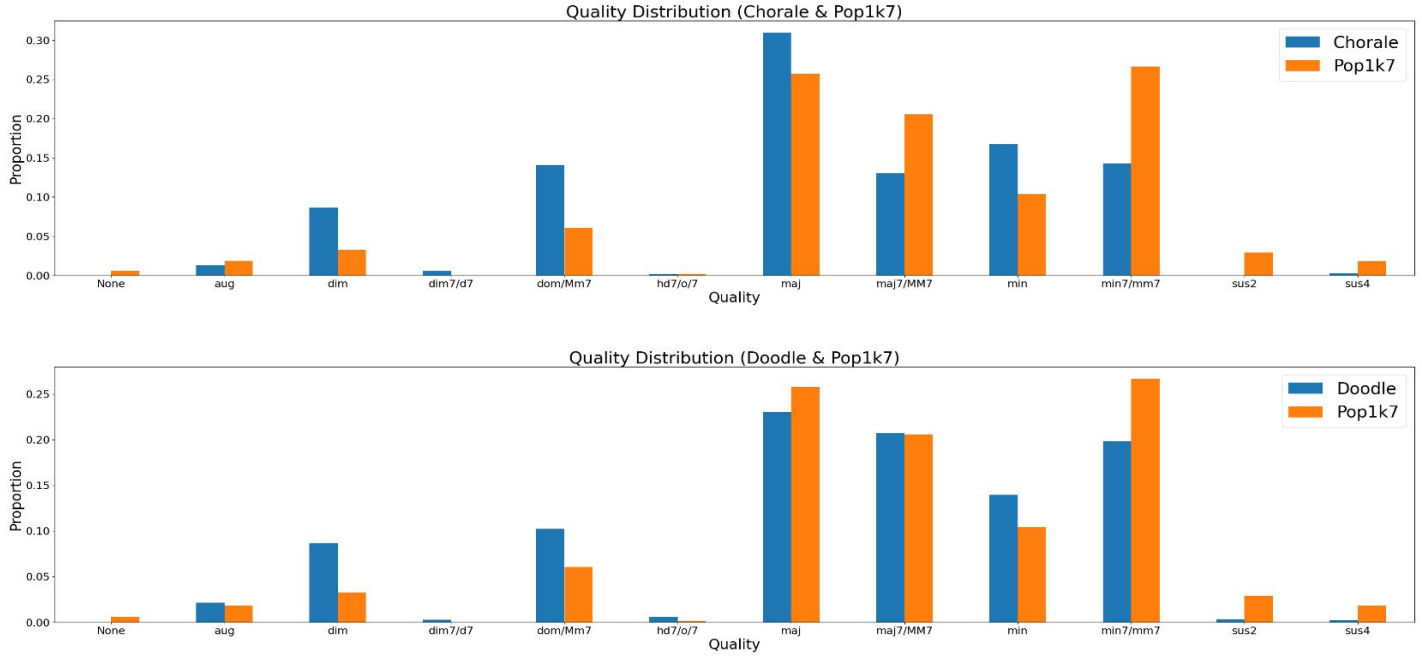
Discussion

- Dataset bias (bach vs Pop1k7) - Chord Distribution (Root + Quality)



Discussion

- Dataset bias (bach vs Pop1k7) - Chord Distribution (Quality)



Conclusion

- Next step
  - Subjective evaluation
  - MMT’s representation leads to empty bar in condition
  - Missing information of chord due to MMT’s representation
  - Statistic is not clear
  - More condition
  - Lead-sheet free