

Lead Sheet Generation and Arrangement via A Hybrid Generative Model

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[Demo Site] <https://liuhaumin.github.io/LeadsheetArrangement/>



Motivation

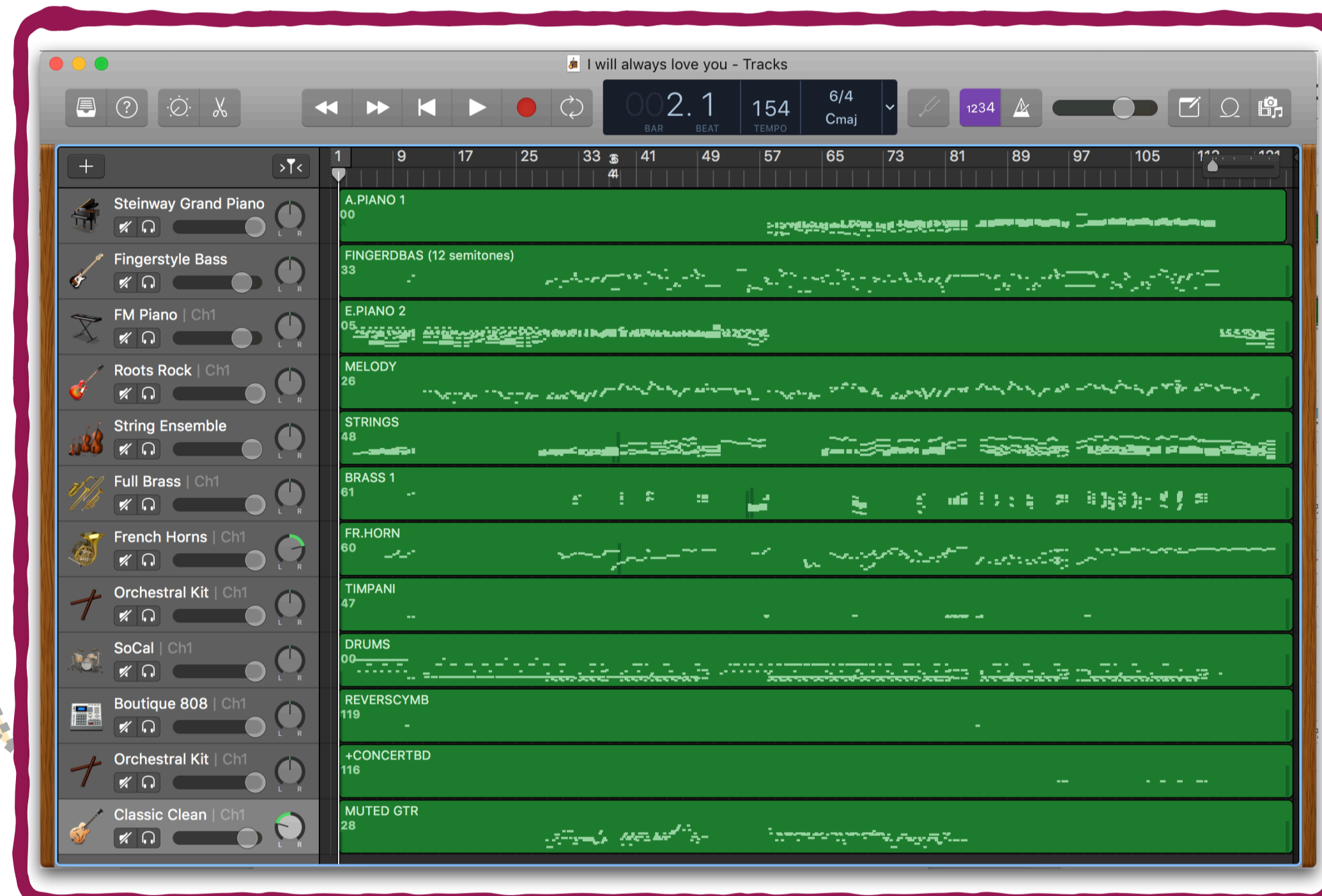
Amazing Grace
Assurance and Joy of Salvation — Saved by Grace 313

Lead sheet comprises a melody line and a sequence of accompanying chord labels. It shows the melody with its corresponding chord label. However, the accompaniment/comping is not yet set.

Amazing Grace Arrangement

Melody
Drums
Guitar
Piano
String
Bass

MIDI indicates all the voicing and accompaniment of different instruments. It includes all the instrumentation settings but does not explicitly show where the melody and the accompaniment are.



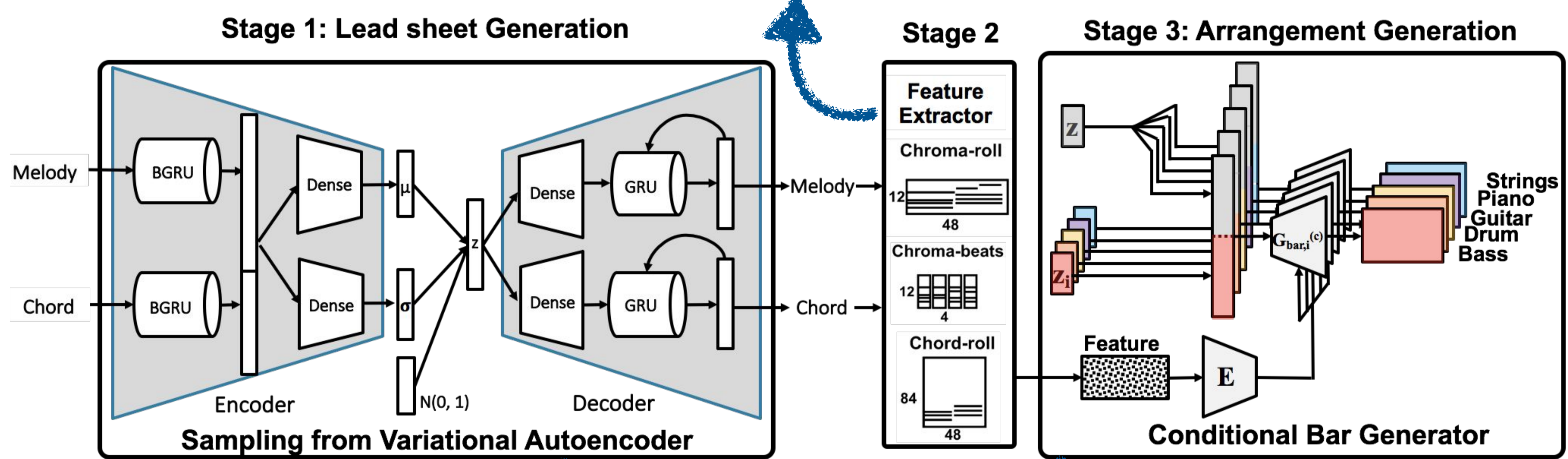
Lead Sheet Arrangement aims to bridge the gap between these two data formats. Our new hybrid model can not only generate eight-bar lead sheets from scratch but also exploits harmonic features from unpaired lead sheets and MIDIs to learn to add arrangement to the lead sheet. We divided the task into two subtasks: *lead sheet generation & arrangement generation*.

Data

- TheoryTab Dataset (TTD)
- Lakh Pianoroll Dataset (LPD)

Architecture

Harmonic feature extraction [1]



Recurrent VAE [3] for melody and chords

Convolutional GAN [2] for polyphonic multi tracks

Results

Lead sheet generation from scratch

Interpolate two songs for mixed style

Payphone → Hey Jude

Conclusions

A novel hybrid conditional generative model is proposed to learn from unpaired lead sheets and MIDIs for lead sheet arrangement, a relatively new task.

References

- [1] Hao-Min Liu and Yi-Hsuan Yang. Lead sheet generation and arrangement by conditional generative adversarial network. In Proc. ICMLA, 2018.
- [2] Hao-Wen Dong, Wen-Yi Hsiao, Li-Chia Yang, and Yi-Hsuan Yang. MuseGAN: Multi-track Sequential Generative Adversarial Networks for Symbolic Music Generation and Accompaniment. in Proc. AAAI, 2018.
- [3] Diederik P Kingma and Max Welling. Auto-encoding variational babes. *arXiv preprint arXiv:1312.6114*, 2013.