Towards Automated Music Arrangement

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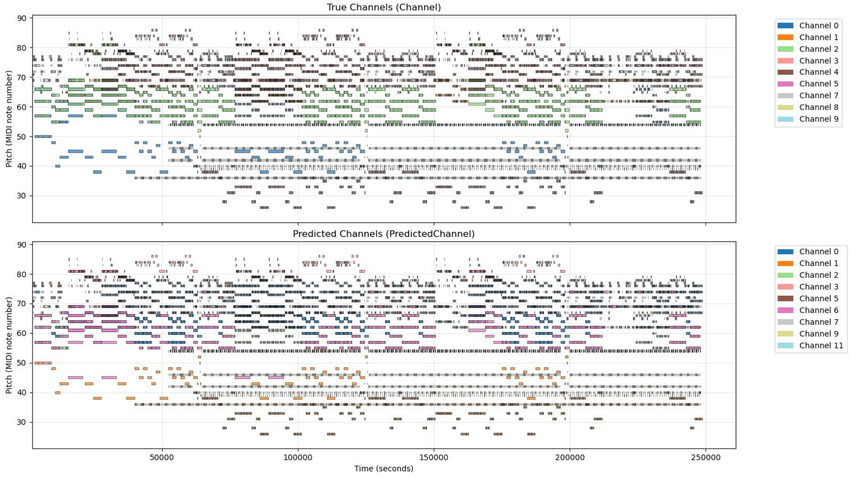
Background and Motivation:

Music arrangement involves adapting a composition's instrumentation, harmony, structure, and style to suit a new context—without changing its core identity. Traditionally, this complex and labor-intensive process is handled by skilled arrangers.

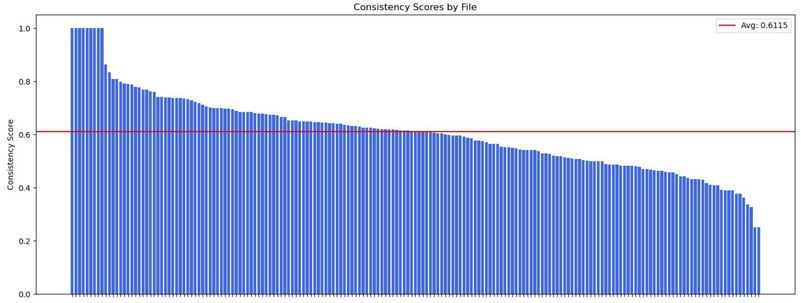
It includes tasks like

- reassigning parts to different instruments,
- modifying voicings,
- transforming genres
  - (e.g., turning a solo piano piece into a full orchestral score).

Automating this process could dramatically expand access to professional-quality arrangements and unlock new possibilities for music creation and education.



Current Work:



We introduce a Transformer-based model that automates the assignment of notes from unlabeled or single-instrument MIDI files into multi-instrument arrangements.

The model evaluates features like

pitch
velocity
timing
duration

to infer coherent instrumental groupings.

Trained on a subset of the Lakh MIDI Dataset with anonymized instrument labels, the model achieved 61% accuracy in reconstructing part assignments on test data.

A key milestone of this project is the successful conversion of piano-only MIDI inputs into full 16-channel general MIDI arrangements—bridging the gap between raw musical data and structured ensemble scores.

Looking Ahead:

This work lays the foundation for future research in intelligent music arrangement systems. Next steps include:

- Enhancing part separation through hierarchical modeling and attention-based architectures
- Incorporating stylistic and timbral conditioning to control genre and expression
- Supporting user-guided arrangement tools for creative and personalized workflows

Long-term, the system could support cross-genre transformation—e.g., rendering a jazz trio as a symphonic suite or a choral piece as a cinematic score.

Summary/Conclusion:

We present an early but promising step toward automated music arrangement, demonstrating that symbolic MIDI data can be algorithmically transformed into expressive, multi-instrument formats. Our approach combines the power of deep sequence modeling with the structure of musical composition to enable new forms of interaction between human creativity and AI. This project contributes to the infrastructure for AI-assisted music production, empowering musicians of all backgrounds to experiment, arrange, and perform with unprecedented flexibility and ease.