Learning to Groove with Inverse Sequence Transformations

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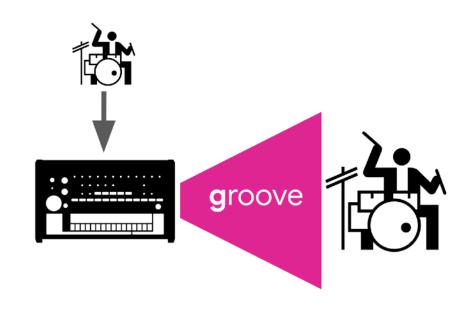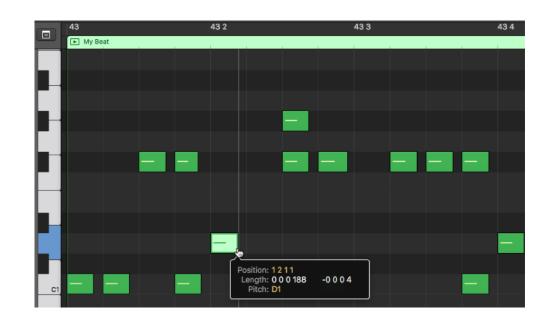
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Questions

- How well can we model drum performances with machine learning?

- Can we use these models to make practical tools that give control to users?

Challenges in Editing Electronic Drums

- It is time consuming to edit the precise timing and volume of each note.

- Our ears connect with human performances.

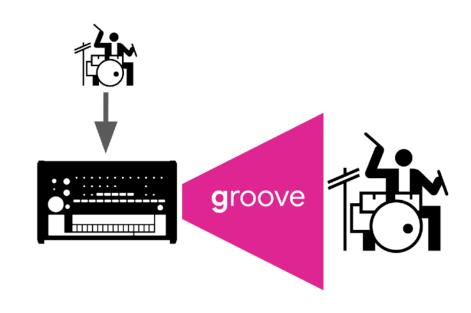- Not everyone can play drums, and recording drum kits is challenging and expensive.
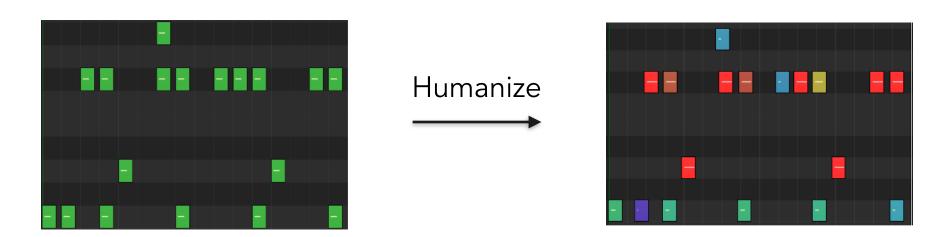
Some Components of a Performance

Contributions

- We build Machine Learning models that condition on **either** a score or a groove, **generating** the other.

- We collected and released the **Groove MIDI Dataset** of professional drum performances for modeling.

Models

Humanize
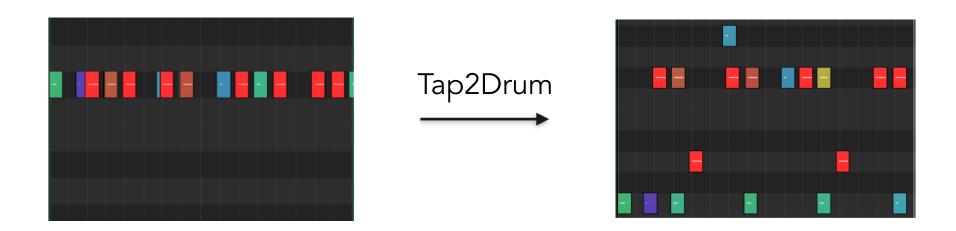
Model Architecture: Variational Autoencoder (**VAE**) or Variational Information Bottleneck (**VIB**) with recurrent encoders/decoders

Models

Tap2Drum
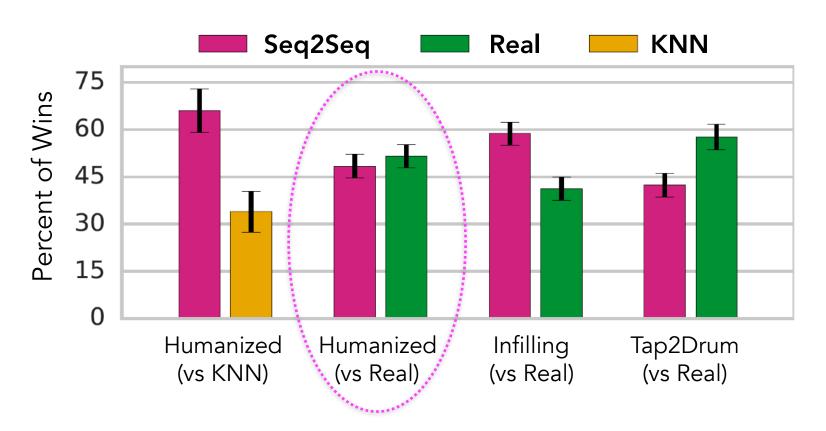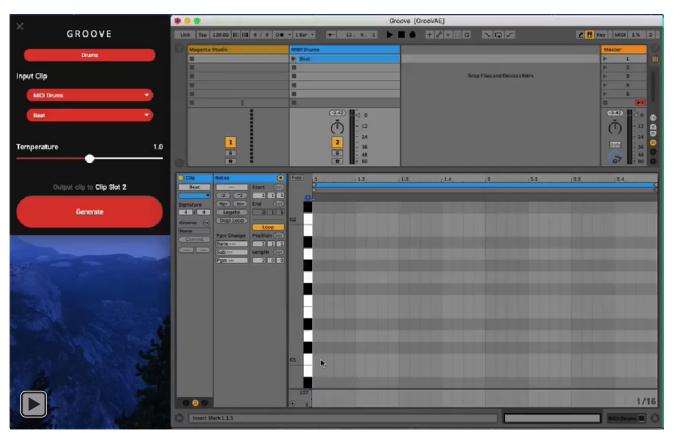
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Results: Listening Tests

Groove Model Demonstration

Drumify Model Demonstration

Questions for the Future

- How do professionals and/or amateur musicians experience working with these tools?

- How can/should we facilitate collaborations with the expert creators (such as drummers) that enable this kind of research?

- What specifically do these models learn? What biases do they capture, and how does this inform future data collection?

Thank you!

g.co/magenta/groovae

Stop by our poster: 6:30pm,
Pacific Ballroom #242 for audio examples,
interactive demos, and more!

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Images
Drummer by Luis Prado from the Noun Project
Drum Machine by Clayton Meador from the Noun Project