Uncovering the Microtones in a Raag From Note Transcriptions

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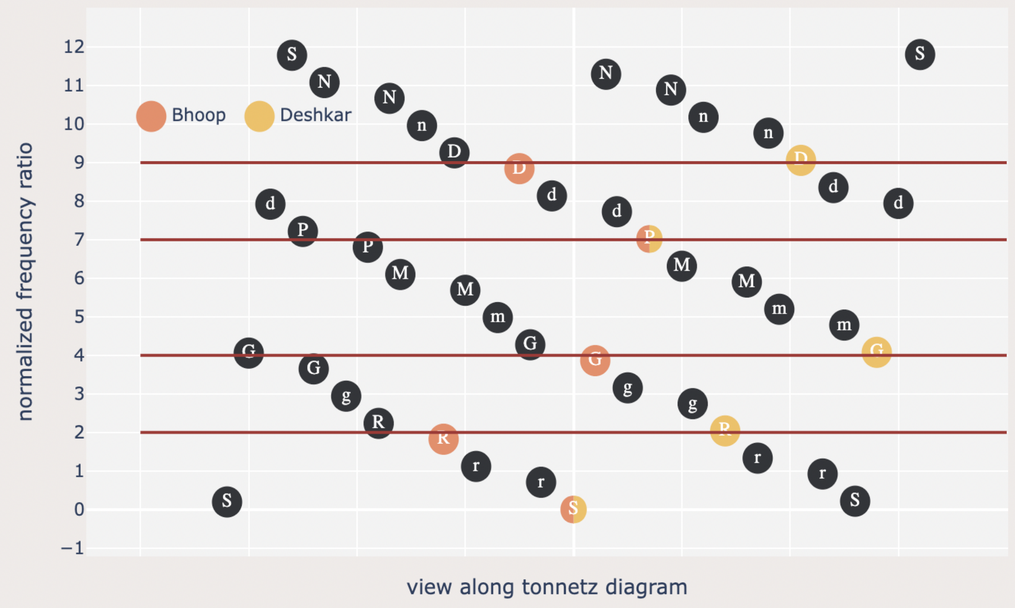
A Mystery: Why are certain tones more appropriate in certain Raags?

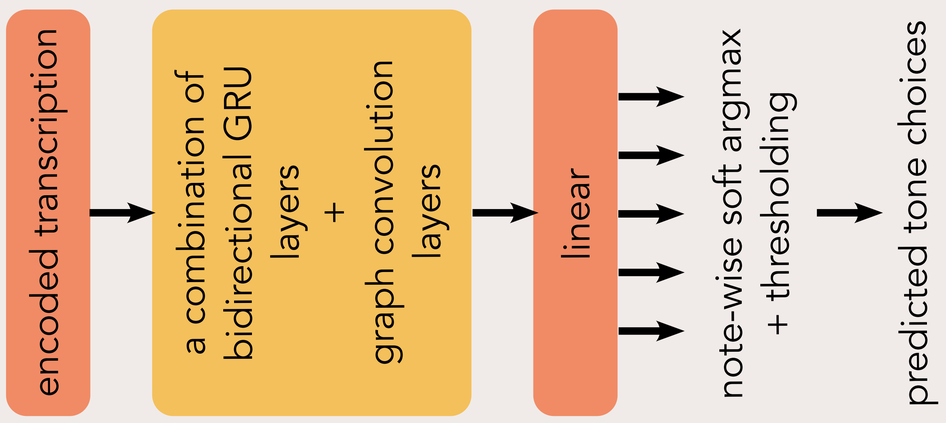
- Hindustani Classical Music is transcribed and spoken of with a 12-note system
- Experienced musicians subconsciously use appropriate tones at natural intervals
- Tone selection correlates to the Raag, being sung/played, via certain underlying mechanism such as
  - relative note weightages / dominances
  - glides/ornamentation applied to a note
  - Raag rules that encourage/prohibit certain combinations of consecutive notes
  - motifs frequently appearing in the Raag, etc.

A Tonnetz Diagram: Raags Bhoop and Deshkar

Natural Tones v/s Equal Temperament



An Approach: Temporal Graph Neural Networks



Transcription $x(t)$ modelled as
a continuous time process over equal-temperament notes

Output $\{y\}_{y \in \mathcal{T}}$ a set of natural tones
covering each note appearing in x

Model aggregates
- bidirectional sequential information
- spatial (harmonic) relationships

A Future

- Highly accurate pitch detection can unlock training from music tracks
- Interpret trained models for music theoretical insights
- Tone selection under different circumstances
  - allow for multiple tone options in a single Raag
  - jointly estimate Raag and Microtones