Musical Micro-Timing for Live Coding
Introducing metre and style-specific probabilistic micro-timing to Sonic Pi

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Introduction

Consider metre as a mental “grid” for events

Expressive micro-timing
• Events expressively altered from categorical positions

Categorical micro-timing
• Uneven spaces between grid lines (the metre itself is uneven)

Sonic Pi live coding language
• How can we improve the “life-likeness” for specific styles?

Metre

Nested objects allow for arbitrary metrical hierarchies

Western music notation

Micro-timing

Probabilistically alter the timing of each note according to its metrical location

Analyse timings from performances relative to isochronous grid

Fit probability distribution with MLE (these encode the actual, non-isochronous metre)

Store a distribution for each event at each level

When playing a note, draw random samples and adjust timing accordingly

Results

Micro-timing data analysis results for two case study styles: Viennese waltz and Malian jembe

Shows a short-medium-long pattern. Black curves show the PDF of the probability distributions.

The second beat in each bar is slightly “early” (short-long-medium pattern).

Acknowledgements

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Source code