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Rubato4Rubato: A software platform for analyzing rubato

A software platform that introduces a new mathematical language to aid musicians, composers, and researchers in exploring and analyzing rubato.

IP Status: Provisional Patent Application Filed

Applications

- Music composition
- Music performance
- Music therapy
- Music education
- Music research

Key Benefits & Differentiators

- **Precise note timing modification:** Software allows for precise modifications to individual note beginnings and endings providing a comprehensive and intuitive approach to rubato analysis
- **Rigorous mathematical framework:** Software uses a new mathematical language and analysis framework specifically designed for rubato enabling reproducible definitions and independent analyses of rubato
- **User-friendly software platform:** Software features a custom graphical user interface that offers a toolbox for defining modulations in note timings, advanced mathematical analyses, and real-time audio feedback making the exploration of rubato seamless and interactive.

Technology Overview

Rubato, the art of manipulating musical note timings to evoke human emotion, currently lacks a rigorous framework for categorization and analysis. The problem with existing rubato analysis technologies is that they primarily focus on tempo changes and cannot thus precisely analyze and modify individual note timings. This limitation hampers the comprehensive understanding and analysis of rubato, as rubato involves not only overarching tempo variations but also precise modifications to note beginnings and endings. Additionally, current methods do not provide a rigorous mathematical framework to categorize and analyze different types of rubato across musical genres and geographical regions. This lack of a standardized approach makes it challenging to compare and study rubato techniques across different cultures and contexts. Furthermore, the lack of user-friendly software tools restricts the accessibility and ease of exploration for musicians, composers, and researchers, hindering the advancement and widespread adoption of rubato analysis.

Researchers at the University of Minnesota have developed a new software platform called Rubato4Rubato. This software uses a new mathematical language that allows musicians, composers, and researchers to explore and analyze rubato. By mathematically capturing and modifying individual note timings, Rubato4Rubato provides a comprehensive and intuitive approach, enabling users to delve into the nuances of rubato across different musical genres and geographical regions. Unlike existing methods that focus solely on tempo changes,

Technology ID
2023-042

Category
Software & IT/Algorithms
Software & IT/Education & Training
Software & IT/End User Software
Software & IT/Simulation & Modeling

Learn more

Rubato4Rubato allows users to precisely modify note beginnings and endings, unlocking a new level of control and musical expression. The Rubato4Rubato software package incorporates a custom graphical user interface, advanced mathematical analysis using cubic spline interpolations, and user-defined inputs for seamless experimentation. It also offers real-time audio feedback, allowing users to explore the direct effects of tempo modulations and note timing adjustments. Whether one is a composer seeking to add depth and emotion to a composition or a researcher investigating the psychological impact of rubato, Rubato4Rubato provides the tools and insights to push the boundaries of music composition, performance, and music therapy.

Phase of Development

TRL: 4-5
Researchers have developed a functional prototype of Rubato4Rubato and are currently testing its applications.

Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

Please contact our office to share your business' needs and learn more.

Researchers

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