

1. Record Nr.	UNISA996601562403316
Autore	Noll Thomas
Titolo	Mathematics and Computation in Music : 9th International Conference, MCM 2024, Coimbra, Portugal, June 18-21, 2024, Proceedings
Pubbl/distr/stampa	Cham : , : Springer, , 2024 ©2024
ISBN	3-031-60638-8
Edizione	[1st ed.]
Descrizione fisica	1 online resource (474 pages)
Collana	Lecture Notes in Computer Science Series ; ; v.14639
Altri autori (Persone)	MontielMariana GómezFrancisco HamidoOmar Costa BesadaJosé Luis MartinsJosé Oliveira
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- Organization -- Contents -- Mathematical Scale Theory and Tuning -- Quarter-Tone Music: A Tuning System Rooted in Natural Harmonic Series -- 1 Introduction -- 2 Quarter-Tones Hidden in Overtones -- 3 A Tuning System Rooted in the 11th Harmonic -- 4 Applications to Maqam Music -- 5 Another Alternative: Non-octave Tuning -- 6 Conclusion -- References -- An Exploration of the Discontinuous-Continuous Fusion in Yuunohui'tlapoa for Keyboard -- 1 Discontinuous and Continuum -- 2 Chromatic Continuum of Scales -- 3 Creation of a Discontinuous-Continuous Macrotimbre -- References -- Rhythm Analysis and Rhythm Generation -- On Brazilian Drum Claves and Generating Rhythm Patterns Out of Them -- 1 Introduction -- 2 Related Work -- 3 Clave -- 4 Generating Method -- 4.1 Genetic Algorithm -- 4.2 Experiment -- 5 Results -- 6 Evaluation -- 7 Discussion -- 8 Conclusions -- References -- What Are "Good" Rhythms? Generating Rhythms Based on the Properties Set Out in The Geometry of Musical Rhythm -- 1 Introduction -- 2 Characterizing the Properties of Good Rhythms -- 2.1 Eveness -- 2.2 Balance -- 2.3 Area -- 2.4 Oddity -- 2.5 Closure -- 2.6 Aperture --

2.7 Deepness -- 2.8 Entropy of Full Histogram -- 2.9 Entropy of Durations -- 2.10 Symmetry -- 2.11 Shadow -- 2.12 Fractal -- 3 Generating Good Rhythms for $k=5$ and $n=16$ -- 4 Generating Good Rhythms for Other Values of k and n -- 5 Conclusion and Future Work -- References -- Euclidean Rhythm with Palindromic Rests -- 1 Introduction -- 2 The Euclidean Rhythms with Palindromic Rests -- 2.1 SubCase 1 -- 2.2 SubCase 2 -- 3 Erdős-Deep -- 4 Almost Winograd-Deep -- 5 Homometric Rhythms -- 6 Constructing New Rhythms -- 7 Arithmetic Progressions -- 8 Applications in Indian Classical Music -- 9 Concluding Remarks -- References -- Categorical and Algebraic Approaches to Music -- Finding Homometric Multiplets. 1 The Z Relation -- 2 Homometric Triples -- 3 Homometric Multiplets -- 4 Musical Applications -- References -- The Sandwich-Lemma: The Recursive Structure of Super-Syntonic and Super-Diatonic Automorphisms -- 1 Introduction: F4-Automorphisms and PWWF Modes -- 2 The Graham Maps and the Kaleidoscope Symmetry -- 2.1 Syntonic and Diatonic Morphisms -- 2.2 The Graham Construction -- 2.3 The Kaleidoscope Maps are Monoid Homomorphisms -- 3 Syn-Diatonic Recursion and the Sandwich-Lemma -- 3.1 Recursive Generation of Syntonic and Diatonic Morphisms -- 3.2 The Sandwich-Lemma -- 4 Outlook -- References -- Hidden Categories: A New Perspective on Lewin's Generalized Interval Systems and Klumpenhouwer Networks -- 1 Introduction -- 2 Revisiting Lewin's Generalized Interval Systems from a Categorical Perspective -- 2.1 Lewin's Generalized Interval Systems -- 2.2 From Lewin's Generalized Interval Systems to Categories, and to Graphs -- 3 A New Definition of Transformational Networks -- 4 Morphisms of CT-Nets -- 5 Conclusions -- References -- Voice and Math: The Art of Singing in Light of Mathematical Music Theory -- 1 Introduction -- 2 The Anatomy of Chest Voice in belcanto Singing -- 3 Mathematical Modeling -- 4 Experiment -- 5 Discussion -- 6 Conclusions -- References -- Structural and Transformational Relations Between Z-Related Hexachords -- 1 Introduction -- 2 The [06] and [016] Subsets in Z-Related Hexachords -- 2.1 Definitions and Preliminaries -- 2.2 Z-Related Hexachords with Two [06] Subsets -- 2.3 Z-Related Hexachords with One [06] Subset -- 3 Z-Related Hexachords and the DFT -- 3.1 Overview of the DFT on Pitch-Class Sets -- 3.2 Application of the DFT to Z-Related Hexachords -- 4 Z-Related Hexachords and Dyad Expansion -- 4.1 Procedure of Dyad Expansion -- 4.2 Visual Representation of the Z-Relation -- 5 Conclusion -- References -- Quantum Music. Quantum Memory and Mathematical Gestures: Two Perspectives on Verdi and Wagner -- 1 Introduction -- 2 Methods -- 2.1 Musical Non-Markovianity -- 2.2 Mathematical Theory of Musical Gestures -- 3 Results -- 3.1 Non-Markovianity Degree for Verdi and Wagner -- 3.2 Gestural Analysis of Verdi and Wagner -- 4 Discussion and Conclusions -- References -- Intro to Quantum Harmony: Chords in Superposition -- 1 Quantum Theory and Music Theory -- 1.1 Superposition -- 1.2 Chord Ambiguity and Equal Temperament -- 2 Superposition and the Diminished Seventh Chord -- 3 Practical Application: Quantum Decision Making -- 4 Future Directions -- References -- Quantum Tonality: A Mathemusical Playground -- 1 Introduction -- 2 Quantum Wave Functions for Gaussian Mixture Models -- 3 Fitting Gaussian Mixture Models for Static Tonal Attraction -- 4 Wave Functions of Static Tonal Attraction as Schematic Stationary Ground States -- 5 Excited States of the Schematic Hamiltonian -- 6 Time Development of Deflected Key Profiles -- 7 Sonification Experiments -- 8 Conclusion -- References -- Theory and Algorithms for Melodic- Harmonic Analysis

and Generation -- Melody and Variation Generation Through KAM Theory -- 1 Introduction -- 2 Some Basic Notions -- 3 Arnold's Theorem -- 4 Algorithm and Implementation Details -- 5 Some Examples -- 6 Conclusions and Future Work -- References --

Modal Pitch Space: A Computational Model of Melodic Pitch Attraction in Folk Music -- 1 Introduction -- 2 From Lerdaahl's Tonal Pitch Space to Tsougras's Modal Pitch Space -- 3 Modal Pitch Space: A Computational Melodic Pitch Attraction Model -- 4 Evaluation -- 5 Results -- 6 Conclusions -- References --

Persistent Homology and Harmonic Analysis -- 1 Introduction -- 2 Persistent Homology and Chord Notation -- 3 Digraph Associated to a Corpus -- 4 Analysis -- 5 Conclusions -- References.

Melodic Contour Generation with Spline Models of Cycles -- 1 Introduction -- 2 Related Work -- 3 Summary of Spline Modeling of Audio Signals -- 4 Melodic Generation with One Sinusoidal Cycle -- 5 Melodic Generation with One Spline Cycle -- 6 Melodic Generation with Several Spline Cycles -- 7 Timbral Model with Splines -- 8 Computation of Fundamental Frequency f_0 -- 9 Future Work -- References --

Geometric Approaches to Musical Algorithms and Microtonality -- I-Shaped Tiles in the Tonnetz -- 1 Introduction -- 2 An I-Shaped Tile: A Music-Theoretic Geometry -- 3 An I-Shaped Tile: Tiling Basics -- 4 Spelled Pitch-Class Space and the Marked I-Shape Tile -- 5 A Brief Comparison: Parallelogram Tiles -- 6 Some Music-Theoretic Features of the I-Shaped Tile -- 7 Music Analysis: "Pure Imagination" by Leslie Bricusse and Anthony Newley (1971) -- 8 Conclusion -- References --

Advanced Polyphonic Music Pattern Matching Algorithms with Timing Invariances -- 1 Introduction -- 2 Time-Warped Problems -- 2.1 Full Pattern Matching -- 2.2 Partial Pattern Matching -- 2.3 Time-Warped vs Plain Problems -- 3 Time-Scaled Problems -- 3.1 Full Pattern Matching -- 3.2 Partial Pattern Matching -- 4 Implementation -- 5 Conclusions -- References --

Tonnetze and Tori for the 19-, 31-, and 53-Tone Equal Temperaments -- 1 Introduction -- 2 The 12-, 19-, 31-, and 53-Tone Equal Temperaments -- 3 Tonnetze for the 19-, 31-, and 53-Tone Equal Temperaments -- 4 Tori for the 19-, 31-, and 53-Tone Equal Temperaments -- 5 Conclusions -- References --

A Model of Scores as Abstract Syntactic Trees -- 1 Introduction -- 2 Harmony, Texture and Instrumentation -- 2.1 Harmony -- 2.2 Texture -- 2.3 Instrumentation -- 3 Composition Operators -- 3.1 Tensor Contraction -- 3.2 Parallelization -- 3.3 Concatenation -- 4 Computational Implementation -- 5 Conclusions and Future Work -- References.

Piston Words -- 1 Introduction and Overview -- 2 Preliminaries -- 3 The Tritone Theorem -- 4 The Language of Atomic Triadic Words -- 5 Conclusion and Discussion -- References --

Fourier Analysis for Music -- DFT and Persistent Homology for Topological Musical Data Analysis -- 1 Context, Definitions and Problematic -- 1.1 Persistent Homology -- 1.2 Topological Data Analysis -- 1.3 General Problematic -- 2 Persistent Homology Using Discrete Fourier Transform -- 2.1 A Model Based on the Two-Dimensional DFT -- 2.2 From the DFT to a Point Cloud -- 2.3 An Illustration of the Model -- 3 Experiment on Artificial Scores -- 3.1 A Point Cloud from the Set of Minor and Major Chords -- 3.2 The Results: PLR-Group and One-Dimensional Cycles -- 3.3 A Study of the Two-Dimensional Tonnetze -- 4 Conclusion and Perspective for Future Work -- References --

Fourier (Common-Tone) Phase Spaces are in Tune with Variational Autoencoders' Latent Space -- 1 Introduction -- 2 MusicVAE -- 3 Pitch Fourier Phase Space -- 4 Experiment -- 5 Results and Discussion -- 6 Conclusions and Future Work -- References --

Fourier Qualia Wavespaces: Hierarchical

Analyses of Set Class Quality and Ambiguity -- 1 Intro: Shedding Light on Wavescapes and the DFT -- 1.1 Hierarchical Music Analysis with Keyscapes -- 1.2 Analysing Pitch-Class Sets with the DFT -- 1.3 Combining Keyscapes and the DFT: Wavescapes -- 2 The Fourier Qualia Space: Definition and Properties -- 2.1 Projecting Set Classes in the FQS -- 2.2 Properties: (Fuzzy) Regions, Convexity, and ``Singularity" -- 3 Qualia Hierarchies in Bach, Debussy, and Webern -- 4 Final Remarks -- References -- Similarity and Distance Measures for Music -- A Fingerprinting-Based Strategy for Musical Genre Similarity -- 1 Introduction -- 2 Audio Fingerprinting -- 2.1 Signal Processing -- 2.2 SpectroMap Algorithm.
3 Musical Similarity Between Audio Fingerprints.
