

Parsimonious voice-leading spaces for tetrachordal, pentachordal and hexachordal K-net graph configurations

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Abstract

In his article entitled "Measuring K-net Distance: Parallels Between Perle and Lewin, and a Generalized Representation of Sum-and-Difference Space" (2009), Michael Callahan developed a parsimonious voice-leading space for trichordal K-families. Using Callahan's research as a springboard this paper seeks to develop similar types of parsimonious voice-leading spaces for K-net graph configurations of all remaining cardinalities.

In order to do so we must first determine the total number of well-formed K-net graph configurations possible and to this end, a graph coloring algorithm is introduced that determines the number of unique coloring schemes available for K-net graph configurations of any cardinality.

Once done, sample parsimonious voice-leading spaces for each distinct K-net graph configuration will be demonstrated. The final section of the paper will adapt similar types of voice-leading models to illustrate transformational voice-leading pathways in inversional-sums as opposed to isographic spaces. Brief analytical examples will include short excerpts from Bartok and Stravinsky.

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Lawrence Shuster received his doctoral degree in music theory from the City University of New York Graduate Center with a dissertation entitled "Transformational Harmony and Voice-Leading: Analytical Applications and Methodological Extensions of Klumpenhouwer Network Theory" completed under the supervision of Philip Lambert. Mr. Shuster has taught previously at the Contemporary Institute of Music in Beijing, China; Brooklyn College (CUNY); Hunter College (CUNY); and the University of Georgia, Athens. His research interests include theories of musical transformation; theories of musical time and jazz theory and analysis. Mr. Shuster has presented papers at numerous international, national and regional conferences including the Society of Music Theory and the International Society for Mathematics and Computation in Music. For the past several years, Mr. Shuster has been conducting interdisciplinary research with the mathematician Jerry G. Ianni. Their joint publication entitled "Groups of Symmetries for Tetrachordal K-classes" has been recently published as part of the selected conference proceedings from the First Annual Meeting of the Society for Mathematics and Computation in Music. In addition to his activities as music theorist, Mr. Shuster is also active as an electric bassist and performs regularly at various venues in New York City.