



# Tuning, Timbre, Spectrum, Scale

By William A. Sethares

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## Tuning, Timbre, Spectrum, Scale By William A. Sethares

The only things truly universal in music are those that are based on biological and/or perceptual facts. *Tuning Timbre Spectrum Scale* focuses on perceptions of consonance and dissonance, which are defined in the *Harvard Dictionary of Music*: "Consonance is used to describe the agreeable effect produced by certain intervals as against the disagreeable effect produced others. Consonance and dissonance are the very foundation of harmonic music... consonance represents the element of smoothness and repose, while dissonance represents the no less important elements of roughness and irregularity." *TTSS* begins by asking (and answering) the question: How can we build a device to measure consonance and dissonance? The remainder of the book describes the impact of such a "dissonance meter" on music theory, on synthesizer design, on the construction of musical scales and tunings, on the design of musical instruments, and introduces related compositional techniques and new methods of musicological analyses. A new chapter contains a detailed explanation of how the software works. It incorporates several important simplifications over the full presentation in the current Chapter 7 in order to allow it to function in real time. Another new chapter describes the various ways that the software can be used. New sections throughout the book bring it up to date with the current state of the subject. *TTSS* offers a unique analysis of the relationship between the structure of sound and the structure of scale and will be use to musicians and composers who use inharmonic tones and sounds. This includes a large percentage of people composing and performing with modern musical synthesizers. It will be of use to arrangers, musicologists, and others interested in musical analysis. *TTSS* provides a unique approach to working with environmental sounds, and there are clear applications for the use of inharmonic sounds in film scoring. The book will also be of interest to engineers and others interested in the design of audio devices such as musical synthesizers, special effects devices, and keyboards.

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