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4aMU5. Complex adaptive systems in music. David Rosenboom (Ctr. for Exp. in Art, Inform. and Technol., School of Music, California Inst. of the Arts, Valencia, CA 91355)

Ways of producing, controlling, and understanding the perception of complexity—particularly as a reflection of natural evolution—is very important in contemporary music composition and is a continuous thread in the author's works. A series of generative models for composition based on characteristics of complex adaptive systems are surveyed. These focus on the creation and organization of musical units in formal, hierarchical structures. Often, these structures contain enfolded shapes or patterns exhibiting properties of self-similarity. Of primary importance in these dynamical models is feedback from either presumed or measured processes in perceptual organization. Various parameter space portraits of their resulting behavior may contain differentiations or separations resembling those of chaotic attractors. Some of the phenomena discussed include: catastrophic bifurcations in perception during continuous transformation of patterns or shapes; pattern attractors in rhythmic organization; iterative transformation with shaping functions producing controlled complexity and enfolded self-similarity; self-organization and spontaneous generation of musical forms; and speculations on the implications of algorithmic information measures for understanding the perception of musical complexity.

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