

MaestroGenesis: Computer-Assisted Musical Accompaniment Generation

Paul A. Szerlip, Amy K. Hoover, and Kenneth O. Stanley

Department of Electrical Engineering and Computer Science

University of Central Florida

Orlando, FL 32816-2362 USA

{paul.szerlip@gmail.com, ahoover@eecs.ucf.edu, kstanley@eecs.ucf.edu}

Abstract

This demonstration presents an implementation of a computer-assisted approach to music generation called functional scaffolding for musical composition (FSMC) whose representation facilitates creative combination, exploration, and transformation of musical ideas and spaces. The approach is demonstrated through a program called MaestroGenesis with a convenient GUI that makes it accessible to even non-musicians. Music in FSMC is represented as a functional relationship between an existing human composition, or *scaffold*, and a generated accompaniment. This relationship is represented by a type of artificial neural network called a compositional pattern producing network (CPPN). A human user without any musical expertise can then explore how accompaniment can relate to the scaffold through an interactive evolutionary process akin to animal breeding.

Composing with MaestroGenesis

MaestroGenesis is a program that helps users create complete polyphonic pieces with only the musical expertise necessary to compose a simple, monophonic melody. Users begin creating accompaniments by establishing a *scaffold*, or melody that will provide the initial rhythmic and harmonic seed for the accompaniment. The accompaniment is then represented as a functional transformation of this original scaffold through a method called functional scaffolding for musical composition (FSMC) (Hoover et al. 2012). FSMC exploits the structure already present in the human-composed scaffold by computing a *function* that transforms its structure into the accompaniment.

These FSMC-accompaniments are then bred like animals might be bred. Once the scaffold is chosen, a population of ten accompaniments is displayed. Each is rated as good or bad by pressing the “thumbs-up” button (figure 1). By ratings accompaniments with favorable qualities higher than those without, the next generation of accompaniments tends to possess similar qualities to the well-liked parents. Through interactively evolving these accompaniments, they grow to reflect the personal inclinations of the user.

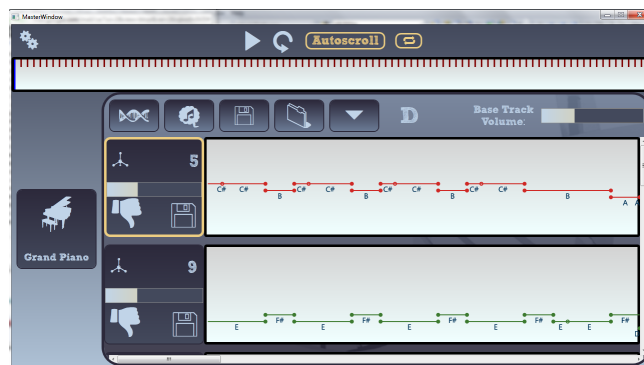


Figure 1: **MaestroGenesis Candidate Accompaniments.** Accompaniments in MaestroGenesis are evolved through a process similar to animal breeding. Candidate accompaniments are evolved ten at a time in an interactive process in which each subsequent generation inherits traits from the previous population.

Conclusion

MaestroGenesis is a program that facilitates creativity in music composition through functional scaffolding for musical composition (FSMC) (Hoover et al. 2012). Accompaniments are evolved through a process similar to animal breeding. The program is available for download at <http://maestrogenesis.org>.

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References

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