Algorithmic Composition of Classical Music through Data Mining

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**Abstract**

The desire to teach a computer how to algorithmically compose music has been a hot topic in the world of computer science since the 1950’s, with roots of computer-less algorithmic composition dating back to the days of Mozart and a pair of dice. One of the biggest limitations of algorithmically composing music to date has been the difficulty of limiting the amount of human intervention required to achieve a musically homogenous, computer-generated composition. We attempt to remedy this issue by teaching a computer how the rules of composition differ between the six distinct eras of classical music by having it examine a dataset of musical scores, rather than explicitly telling the computer the formal rules of composition. To pursue this automation of the algorithmic composition process, we examined the intersectionality of algorithmic composition with the machine learning concept of classification. Using a Naïve Bayes classifier system, the computer learns to classify pieces of classical music into their respective musical era based upon a number of explicit attributes extracted from the data. It then attempts to primitively recreate each of these six musical styles using a technique inspired by cellular-automata, with rules informed by the output of the classifier. The success of this process is twofold determined by feeding samples of its compositions as a test set into a number of classifiers deemed to have a high success rate among a training set of traditionally composed pieces, as well as by analysis of the pieces performed by studied musicians. We concluded that the process adequately replicates the attributes on which the classifier focuses. It shows the potential of further hybridization of classification techniques – ones which focus on different attributes within classical music – with composition techniques. This hybridization could potentially further remove human intervention from the process, and result in more wholly homogenous generated pieces of music.

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