Machine Learning Approach for Harmonizing Songs

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This research examines the possibility to use computer algorithms to solve problems which involve creativity and artistic skills. In this work machine learning algorithms are applied to a melody harmonization task. I compare the ability to harmonize a melody of popular songs by four algorithms: Gaussian Naive Bayes (GNB), Support Vector Machine (SVM), Decision Treesand Random Forest. Quantitative evaluation of such performance was done with several comparative parameters. Random Forest was the most successful algorithm, slightly ahead of Decision Trees. While this algorithm did not capture high order harmonic relations, I demonstrate an ability of machine learning to perform such a traditionally human function as melody harmonization with a reasonable success. Optimization of the algorithms with respect to a higher level organization of music such as rhytmicity, tonality and stylistic nuances of harmony would bring the harmonization routine to a significantly higher level and presumably resemble human performance.

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