INTRODUCTION

Nuances in the performance of "live" music are very important in determining the quality of sound and music. Although, nuances are also related to the musical composition and instrument, this paper will consider only the nuances which pertain to performance. The nuance variables, such as vibrato, tremolo and dynamics have direct counterparts in signal generation corresponding to frequency modulation, amplitude modulation and intensity. One interpretation of frequency modulation, or more precisely, frequency variation, is pitch variation. Many tones produced by the performers of conventional instruments do not result in "constant pitch tones". A beginner on a brass instrument will sound very much out-of-tune, because he has little control over his lip muscles which form the embouchure. One can observe by inspection the ease with which considerable pitch variation is possible as a function of a very loose embouchure. Training will develop muscle control such that the performer can utilize as much or as little pitch variation as he requires for producing interesting musical results. More subtle frequency variations however are found in attacks and slurs, and in the bulk of the tone due to the non-periodic characteristics of musical sounds. Although these variations are not perceived as pitch variation, they represent important information in synthesizing "live" sounds. In general, nuance algorithms are developed by taking the view that the stylistic properties of performance can be represented by nuances. Specifically, nuance variables are translated to waveform parameters which are modeled by heuristic and statistical data.

Some recorded samples of synthesized sounds will be presented.

OUTLINE OF TALK

A. Description of nuances in the performance of "live" music
B. Heuristic and statistical properties of nuances as related to style and performance
C. Formulation of nuance variables
D. Translation of nuance variables into waveform parameters

DURATION OF TALK

25 Minutes