Virtuosic Embodiment of a Modalys String through Color Tracking Technology

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ABSTRACT

This paper introduces the use of Modalys (a physical modeling synthesis tool) String in live settings by utilizing color tracking technology through MaxMSP/Jitter. This essay explores the approach of creating highly detailed and creative sounds by adjusting parameters such as the density, radius, and length of various physical materials. Furthermore, it discusses methods for effectively performing and composing in a live environment.

1. INTRODUCTION

Modalys String is divided into a mono-string object, primarily used for plucking, and a bi-string object, used for bowing. Each object generates sound by receiving values for horizontal and vertical positions, simulating the actual friction between the bow and the string. Additionally, factors such as weight, rosin, and access position significantly influence sound generation.

2. PARAMETERS OF MODALYS STRING FOR GENERATING SOUND

In the experimentation of bowing access points for Modalys String, several parameters were analyzed. The vertical position ranged from -0.001 to 0.001, where values below the minimum (upper side) produced a light, harmonic, sul tasto sound, while values at the maximum (lower side) created a harsh, tough, sul ponticello sound. The horizontal position varied between -4 and 4, determining the lateral smooth movement. Weight was tested between 0.7 and 1.0, affecting the pressure applied to the bow and thereby influencing the dynamics of the sound. Finally, the access position ranged from 0.5 to 0.01, controlling the precise point of contact on the string and significantly impacting the tone quality.

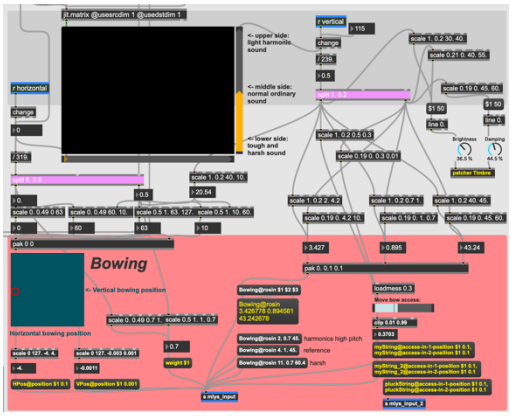

Figure 1. MaxMSP patching for the primary parameters for Modalys.

3. A DIVERSITY OF MATERIALS FOR MODALYS STRING

Modalys creates strings from a variety of materials by adjusting the density and Young's modulus values of different metals, woods, and synthetic materials. The range of material properties studied at IRCAM spans from spider silk to uranium, allowing for extremely nuanced changes in sound. This information can be input into Max/MSP, making it easy to implement and manipulate sounds in real-time.

Physical modeling synthesis with Modalys requires recomputation each time parameters change, which can lead to clicking and other issues. Traditionally, the melt-hybrid object has been effectively used when changing materials or pitches. Therefore, I connected the two strings in a hybrid configuration and implemented a separate mono-string for plucking, thus completing the Modalys coding.

Figure 2. Modalys coding in the Max/MSP environment.

Additionally, materials and pitch changes through the hybrid system are designed so that while String 1 is producing sound, String 2 undergoes modifications over time. These changes and visual information are then patched and displayed to the performer.

Figure 3. Example of the pictures of the pitches and materials in the hybrid object section.

4. COLOR TRACKING APPROACH VIA JITTER

Important parameters of Modalys String are adjusted by tracking colors captured by the camera through Jitter.