Live Performance and Virtuosic Pitch-Bend Technique for the Synthesizer.

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Abstract

The Pitch-Bend controller is probably the most widespread commercial ancillary controller found on keyboard synthesizers and controllers. Due to the polyphonic, harmonic nature and the notation of Western Classical music, pitch bend has never been a significant parameter for musical expression. In general, pitchbend controllers are used little or not at all in synthesizer performance. Asian music traditions, such as the South Indian Carnatic and South-central Vietnamese Ca Nhu traditions, demonstrate unique pitch-oriented ornamentation. Accurate, computer-transcriptions of ornamentation have been undertaken and new performance techniques for synthesizer have been developed in order to perform traditional repertoire. This paper presents the basics of Carnatic music and Ca Nhu music ornamentation, in theory and practice, together with a discussion of performance strategies such as controller techniques and instrument configuration.

Introduction

This paper presents the results from a single project of a broader research effort aimed at developing a new music repertoire for live-performance-based synthesizer ensemble. This project aims to adapt virtuosic performance practice and string-instrument instrumental techniques from selected Asian music traditions. These Asian music traditions include the densely ornamented South Indian Carnatic music and South-central Vietnamese Ca Nhu music traditions. Other concurrent areas of research include: a historical survey of synthesizers and synthesizer control interfaces, a study into the aesthetic symbolism, iconography and design of the South Indian vina, the development of the LDR controller, the construction of ensemble of LDR control interfaces (2 LightFingers & a LaserLyre) and the development of notation for the ensemble. Private vocal and instrumental tuton was also undertaken on a regular basis in Carnatic vocal, Vietnamese-Dan tranh (a 17 stringed Vietnamese zither) and Dan bão (an unusual Vietnamese monochord zither).

Karnatic music

The South Indian Karnatic Music tradition is very rich in ornamentation and the music lacks true vibrato or modulation (Deva, 1981). The tradition boasts the existence of over three thousand different nagas or melodic sets of swaras (swaras; a pitch combined with ornament). Often nagas with exactly the same pitches are distinguished by ornamentation or gawai. Gawai is a comprehensive term and includes all slides, glides, trills, swings, stresses, cuts and jerks (Kumar, 1997). With the exception of cuts, swara, all of these ornamentations are pitch-bend type gestures. Gawai performs an integral, rather than just a decorative function in Karnatic music. Gawai is pitch specific and in addition have specific ascending (swaras-f) and descending (gawai-b) forms. Pitch-bend is also used to define the note and beat structure through sung vowels while other gawai are related to pitches, melodic cadences and virtuosic performance practice within range extrapolation.

The study focused on three main systems of contemporary gawai: the "Panchahita" vocal and vina gawai, the instrumental system of ten gawai and Subramaniam Dikshitar's system of "fifteen gawai". Gawai included in the study are: swaras, jhumki, lalita, anubhava, pancha, aadadha, pratyangur, tampa, ahuta, nookka, khandirupu, wan, jervi, kavula, ahuta, khandirupu, wan, jervi, kavula, ahuta, khandirupu, wan, jervi, kavula, ahuta, khandirupu, wan, jervi, kavula, ahuta, khandirupu, wan, jervi, kavula, ahuta, khandirupu, wan, jervi, kavula, ahuta, khandirupu, wan, jervi, kavula, ahuta, khandirupu, wan, jervi, kavula, ahuta, khandirupu, wan, jervi, kavula, ahuta. Although ahuta, pratyangur, nookka and khandirupu are all similar stress type gawai they are differentiated by their technical execution on the vina and violin, (Swift, 1990), (Viswanathan, 1977).

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Vietnamese Ca Hue

The art of musical ornamentation in Ca Hue music is known as hoa riñe, which can be translated as meaning “artistic flowers”; (hoa –flowers; riñe- as in MY riñe a term meaning the “Arts”). Another term for ornamentation is layeflèdy. This term literally means “bending” and is similar to the Karnatic term gamaaka. Layeflèdy is also used as a term to describe the groupings and combination patterns of smaller specific ornaments some of which are instrument specific, (Nguyen, 1984), (Hung, 1990). The melodic inflections found in the spoken Vietnamese language also form an important source for the creation of musical ornamentation.

There are two ornaments that are common to both vocal and instrumental traditions, rung and road, (Hung, 1990). The term rung, is sometimes used in conjunction with these other terms and translates as meaning pressure. Rung is a pitch based oscillatory ornament which demonstrates a uniform oscillatory speed. Unlike Indian music gamaakus, oscillations in Vietnamese music are not further subclassed by their pitch compass and speed. The ornament rung is best described as a “perk” or stress, (Hung, 1990). It is performed on the dàn tranh by bouncing the finger of the left hand on the string resulting in a sharp rise and fall in pitch. Perks can be played singularly or repeatedly, like sakhurita gamaaka on the vina in Karnatic Indian music. MB and rung can be combined to form ornamentation aggregates or white layeflèdy, (Hai, 1984). Ornaments specific to the dàn tranh are the terms vọt and nhày. Vọt, means sliding and could be best described as a slur or slow bend to reveal a higher tone. Nhày means jumping and is a faster accented slur to a higher note, (Hai, 1984).

Transcription and Synthesizer technique

Data was collected in the form of recordings made of Melbourne based musicians. Performances were recorded and then digitized and analysed by a Macintosh computer. An analyses program was used to determine the fundamental frequency and transcriptions of the ornaments were obtained. Ornaments were studied first in isolation and then in the context of traditional repertoire and improvisation. Microtonal tuning systems were programmed directly into the synthesizer and via computer using the program MAX.

It was found that Karnatic music could be adapted to synthesizer quite successfully. In order to do this however, the use of a breath controller (to control volume) and the use of a pitchbend wheel-extension proved to be necessary. The best form of pitchbend extension was found to be a 4-5 inch section of lightweight bamboo. A pitchbend range of +/- 5 semitones was found to be adequate for the execution of nearly all the gamakas with the exception of jerec, slides. It was found that the performance of jerec (slides) could be accomplished by the use of synthesizer portaments. Complex and virtuosic strum and speed phrases were adapted to synthesizer in mono-mode while others could be played entirely on pitchbend controllers.

Adapting Vietnamese ornamentation and instrumental techniques proved to be more difficult. Firstly, ornamentation associated with the monochordal zither, the dàn bò, proved to be very intricate and virtuosic. The use of synthesizer modulation for rung ornamentation was soon abandoned due to the subtlety and variation of these ornaments. Negotiating the dead-spot of commercial synthesizer controllers was also difficult. Some success was obtained using a magnetic proximity controller to effect pitchbend but a great deal of practice is required to master this. Dàn tranh techniques were harder to translate to the synthesizer due to the use of polyphonic pitchbend. Polyphonic pressure and the use of multi-simular setups, proved to be the most successful approaches to dealing with this issue. Designs for a specialized LaserZither synthesizer controller are in progress to deal more specifically with this issue.

References:


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