A Confluence of Computer Music and Ancient Chinese Aesthetics

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The accessibility of performances and recordings of the music of diverse styles and cultures has made it possible for modern composers to be influenced by the philosophical and practical concerns of music in cultures that are not directly related to their own. Such a confluence may be found in the inspiration and influence which computer music today may derive from the aesthetics of the traditions of Chinese poetry and music. This paper reviews aspects of ancient Chinese theories of art which have the potential to influence computer music. The application of these theories to a composition is described.

This paper summarizes my research and creative work, originally proposed in 1982 and carried out between 1987 and 1991, in applying concepts from Chinese poetry and aesthetics to computer music. A confluence of Chinese aesthetics and computer music occurs because in both areas careful attention is accorded to acoustic features and their evolution as elemental components of structure. Aspects of Chinese poetry and music which have the potential to influence computer music are: careful attention to the contour and sculpting of individual sounds, imagistic composition, and attention to resonance and atonality. These concepts have deep roots in the structure of Chinese language and literature and in the two philosophical traditions which have dominated Chinese thought since ancient times, the socially oriented teachings of Confucius and the metaphysics of Taoism (the teachings of Lao Tsu).

On the phonetic level, a syllable in the Chinese language is constructed from an optional initial consonant, a final vowel-consonant unit, and a pitch trajectory called a "tone." The initials, finals, and tones supply the pitch, color, and pitch materials of speech. In Mandarin, there are four tones: (1) level, (2) rising, (3) falling in the low part of the vocal range and then rising, and (4) falling. There is also a half-third tone, in which a syllable is pronounced briefly in the low part of the vocal range. The tones in ancient times were different from those of today, and in other dialects of Chinese there may be more than four tones. Whatever the dialect or time period, each syllable is associated with a Chinese character, and there may be several different characters each having the same sound. In Chinese, the semantic and phonetic boundaries coincide, since the single syllable or character is the normal semantic unit, although two-syllable words also exist. In poetry, disyllabic and trisyllabic phrases are placed in a structural matrix according to conventions for the arrangement of tones and for rhyme schemes.

Chinese poetry is imagistic; sentences are relatively short. The structure makes use of parataxis, the "side by side" arrangement of ideas, as opposed to hypotaxis, the temporal and logical sequence involving connectives. (Kao and Wei, 1970). Responding to paratactic procedures, the reader must actively find the deep underlying relationships among images. Making a similar observation, Cheng [1986] finds in Chinese poetry a "language conceived no longer as a denotative system that 'describes' the world, but as a representation that organizes the connections and provokes the acts of signifying.'"

Many four-line Chinese poems have a three-part structure. The initial question introduces a scene in the external world. In middle couplet, the poet engages in introspection associated with the opening scene. In the final line, reflects on human experience, often in the senses of family, friendship or society. A wide range of human experience is conveyed with only a small number of characters laden with meaning and associations.

In a language which accords attention to the details of contour and articulation in a single sound, and in a poetry which is imagistic rather than syntactic in character, one may discern the roots of those traditions of Asian music which place considerable emphasis on the sculpting of each individual note. Careful production of a single note's continuously changing features is identified by Chou Wen-Chung (1971) as an
important marker which distinguishes Asian music from Western music, the latter tradition turning attention instead to polyphony and harmony. Some aspects of the evolution of the East Asian tradition will now be described.

Confucians lived from 551 to 479 B.C., in an age dominated by primitive fears and superstitions. By redefining the concept of ˇien (harmlessness, humanity, human relations), he greatly increased awareness of the human capacity to control destiny by means of good government, elimination of barbarity, and altruistic human relations. In the Confucian tradition the will is seen as a mobilizing force for the artist's promotion of benevolent government, as well as for the artist's moral introspection and conduct. The extent of Confucian's practical attitude is revealed in his exhortation, "Young men, why do you not study Poetry? It can be used to: inspire, to observe, to make you fit for company, to express grievances, near at hand, [it will teach you] to serve your father, and, [looking] further, (how) to serve your sovereign; it also enabled you to learn the names of many birds, beasts, plants, and trees." [Liu, 1975, p. 109]

The importance of formal musical performance in social organization was described in the essay on music which is included in the Yi-chi (Record of Music) which is a chapter of the Li-chi (Book of Rites), one of the Five Confucian Classics.

"Simplicity and union are the aim of music; difference and distinction, that of ceremony. From union comes mutual affair, from difference, mutual respect, but it is the same feeling of respect (which they express). The styles of musical pieces are different, but it is the same feeling of love (which they promote) ... Music is (an echo of) the harmony between heaven and earth; ceremonies reflect the orderly distinctions (in the operation of) heaven and earth." [Yüeh Chi]

Here music is viewed as an internal manifestation of ancient cosmology, and ritual is viewed as an external representation. The role of music in ritual was to internalize a sense of devotion with respect to one's participation in the social order. The relationship between music and the social order was taken so seriously that musical scales were considered to possess specific correspondence with the physical stability of a society. Tones which deviated from canonical tuning were described by some writers as ˇieh (changed, deviating), a literary term referring to odes written after the period of the virtuous kings of the Chou dynasty, and under tyrannical or weak kings.

The five notes of the ideal pentatonic scale were associated with tradition with corresponding attributes in other realms of experience: the five phases (wood, fire, earth, metal, and water) and their correlates in the domains of "winds, weather phenomena, sensory functions, visceral functions, smells, tastes, colors, emotions, social classes, sage-rulers, planets, creature classes, seasons, directions, trees, and on and on." [DeWoskin, 1982, p. 68]. The sanctity of the scale tones led to extensive research into the perfection of tuning systems.

Given the great significance of the five tones, the tuning of scale pitches became the fixed parameter in ˇieh music, as DeWoskin points out, leaving other areas of sound production as the degrees of freedom: articulation, portamento, color, resonance, and afterwards. The exploration of these parameters as techniques for playing the plucked zither (ˇi ˇia ˇis) resulted in a prescriptive notation system for the instrument. The player is told which string to play, and one of more than a hundred playing techniques (such as pitch bending, scraping on the strings, or harmonics) may be specified. Often, the instrument sounds after the player has come to rest, and the instrument is silent while the hands are in motion in the initial stages of a plucking gesture. The hand positions for the ˇieh ar are stylized and symbolic. Each sound-producing technique is a complicated succession of hand positions and postures, and each has an association, by written tradition, with a poem and image. The poems denote the natural processes such as "Sending a Sound Through an Empty Valley" or "A Secluded Bird Pecks at the Tones" [DeWoskin, 1982, pp. 132-133].

I have just presented an overview of how the relationship of music to society in Confucian thought led to a musical tradition valuing the careful sculpting of sound quality. In considering the Taoist tradition, one leaves the domain of government and society and considers the interior of the self, the idea that the principle of an individual creature is in harmony with the universe. Literally, Tao means "way", and it may be described as the "principle of the universe" or as "the unitary principle of all things and the totality of all being" [Liu, 1975, p. 16]. The philosophy
is embodied in a relatively brief classic text known as the Tao-te ching (Classic of the Way and its Virtue) or as the Lao Tzu, the latter being the name of the author. Historians do not possess information establishing the dates of birth and death of this figure, whose life is known to us in the form of legends. Tradition believes him to have lived early enough to have been twenty years older than Confucius, but many scholars believe that he lived as late as the third century B.C.

The events according to the interior in Taoist thought is shown in Chuang Tzu’s striking account of his butterfly dream [Chan, 1963, p. 190]:

Once, I, Chuang Tzu, dreamed that I was a butterfly and was happy as a butterfly. I was conscious that I was quite pleased with myself, but I did not know that I was Chu. Suddenly I awoke, and there I was, visibly Chu. I do not know whether it was Chu dreaming that he was a butterfly dreaming or the butterfly dreaming that it was Chu. Between Chu and the butterfly there must be some distinction. This is called the transformation of things.

The space and time limitations of this prior prevent an extended discussion of the wealth of terminology and concepts related to Taoist thinking about the arts, a representative concept will be presented here. Perusing almost any treatise on Chinese art, one cannot fail to encounter an instance of the ubiquitous word ch'i. It is usually translated as “vital force” or “confined energy”, but it can also refer to vapor, breath, spirit, and even individual talent [Lin, 1975, p. 5 and p. 70] (but there is another word for “talent”). Kuo writes that “On the level of mental action, it is the ‘intentional force’ which directs the artist to fulfill his plan.” [Kao, 1991, p. 22] Ch'i may be an attribute of the artist, the work of art, the entity depicted in a work of art (even insects or still life), or the activity performed in producing the work of art. As early as the Han period (206 B.C. - 220 A.D.), experimenters in China performed experiments to study the nature of ch'i, “it being the means by which apparently disconnected phenomena were related. Ch'i was the energy that brought the sound from otherwise dead pipes” [DeWoskin, 1983, p. 195] or that brought about many forms of air in motion, such as breaths or wind. Chuang Tzu’s prescription for listening [Lin, 1975, p. 31] offers insight into the centrality of ch' i in aesthetics.

“Don’t listen with the ear, but listen with the mind; [better still], don’t listen with the mind, but listen with the spirit [ch'i]. The car stops at listening, the mind stops at matching [things with concepts], but the spirit is empty and receives all things. Only the Tao will gain insight and emptiness is what means by ‘mind’s abstinence.’”

Chuang Tzu understands that hearing is passive and that a higher level, cognition, exists as a matching process. This passage can be interpreted in two ways, because the word for “mind” is also the word for “heart”, and the mind and heart are fused, rather than separate, in Chinese thought. A matching process related to the heart would imply a corroboration of the cognitive image of the of the sound with outer corporeal states already present in the mind. If “mind” is considered purely as thought, then perhaps Chuang Tzu formulated the concept of expectations, as proposed by Meyer [1956, 1973] in the twentieth century. Whatever type of matching was meant in Chuang Tzu’s prescription to “listen with the mind”, he proposes that there is a level of aesthetic experience beyond perception and cognition.

By means of the concept of ch'i breath and wind are symbols of an artistic mastery so ingrained that it becomes internalized and intuitive. We can procedures associated with inspiration, since both forces are ephemeral and of indeterminate origin. The insistent air and wind are coupled with an interest in the music of the earth, i.e., the sounds from the surrounding natural environment, as in Chuang Tzu’s early observation [Chan, 1963, p. 190]:

“The breath of the earth is called wind,” said Tzu-chi. “At times it is inaudible. But when active, angry sounds come from thousands of holates. Have you ever listened to its prolonged roar? The peaks and heights of mountains and forests, and the hollows and cavities of huge trees many a span in girth are like sources, mouths, ears, beam-sockets, goblets, masts, paddles, and pools. The wind rushes into them, rushing, whistling, making an explosive and rough noise, or a withdrawing and soft one, shouting, wailing, moaning, and crying. The wind that comes about sings ‘yil’ and the wind that follows echoes ‘yung.’ When the winds are gentle, the harmony is small. and when the winds are
vicious, the harmonies are great. When the fierce gusts stop, all hollows become empty and silent. Have you ever witnessed how the strings sweining and bond [after the wind is gone]?"

The persistent importance of zh'i can be heard in zh'i techniques extant today: playing ephemeral passages of harmonies, scowling the strings so that we hear a noise spectrum, letting the strings vibrate, and tapping the instrument to produce resonant percussive sounds. Zh'i remains a guiding principle in East Asian musical thought, as in Takemitsu's [1989] statement that Japanese music is concerned with sound as it travels in air, whereas Western music is concerned with sound at its point of production.

Contour, image, and resonance - concepts from the Chinese tradition - were the guiding principles in the present author's composition entitled Autumn Cove, Spring Night. This work is based on two poems by Li Po (701-762), "Autumn Cove" and "Spring Night in Lo-yang - Hearing a Flute." As source materials for the composition, recordings were made of a recitation of the two poems and of informal performances on the di (transverse flute) and the erhu (two-stringed bowed lute). In addition, sounds of tree branches were recorded. All of the sounds in the piece are the result of applying digital signal processing techniques to the recorded materials, influenced by Koyama's [1982] work with English speech. By means of algorithms such as elliptic filters, linear prediction, the phase vocoder, a room simulator, and a chorus plug-in, it was possible to transform the recorded source materials into textures portraying the imaginative nature of the poetic text while preserving pitch contours when present in speech. Unvoiced consonants could be processed to create wind sounds relating the flute to the voice. In the second poem, having the tripartite structure described above, it was possible to portray the poet's introspection in the middle couplet by enhancing the unvoiced quality of the speech and reducing its intelligibility. In these and other ways, the philosophical aspects of Chinese music and poetry, combined with the phonic structure of Chinese syllables, offer fruitful inspiration for the projection of imagistic texts.

REFERENCES
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