

## Psychoacoustic thinking and the compositional process

Several physicists and psychology/perception oriented research scientists have been concerned with and analyzed sound from the perspective of the listener. The results of their studies have been indeed very insightful, and the composer can only be enlightened and inspired by such research. Most of this research actually traces evidence that composers have been thinking about sound and its perception far more than one might assume, even as far back as the baroque, and beyond.

Trying to reverse the research process however, and find a way that such insight can be used by the composer in his everyday work finds him facing issues. Firstly, there is yet to be found a precise way of planning sound efficiently beyond traditional western notation. Many composers have worked out individual notational systems that go beyond pitches and durations, but there is still no way of factoring in perceived passage of time, or musical time, and precise movement of sound masses, or even perceived or not brightness of sound. My ideal model of such a system would be a 3D computer animation program that lets the composer create sound sculptures in time, and then be able to view and manipulate the structure from any angle he wishes, all in strict time ratios. Such a model would include a complete spectral profile of the sound as it's being molded, and would be able to break the sound down into its components, and reconstruct it with different available instrumental timbres. That way fusion would be able to be carefully designed and controlled, and streaming effects would be able to be designed in a much more subtle way, making possible much more intelligent games with the listener's perception.

This of course, would create the need for a new notational system for the performer, who would need more information than pitch, duration and relative dynamics to achieve precision in this kind of sound thinking. It would involve the player being able to play into an analysis system that gives him real time sound information that he can react to and manipulate as he shapes his sound, and the composer would give him precise instructions in relation to that system, so that dynamics, brightness, vibrato, pitch and temporal and spatial relations would be precise and codified. This would leave very little room for error in rehearsal, and the composer's intentions would not be lost in the codification/de-codification vicious circle of our present notational system.

I couldn't be sure, but I think that the technology is there for such a task, and steps have been taken in that direction. It would take a fruitful collaboration between composers, psychoacousticians, physicists and computer scientists to create such a model, and it probably would take a lot of interdisciplinary research, but I think its time has come.