

ISE575c paper review (week 8)

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Iannis Xenakis's *Achorripsis*: The Matrix Game, Linda M, Arsenault

Iannis Xenakis is one of the greatest composers in the twentieth century. He was famous for composing music with the theories of mathematics and physics. *Achorripsis* (meaning the jets of sound) is composed in 1957 following the distributions of Poisson's law.

Basic $28 \times 7 = 196$ blocks is the blank chart. 7 rows means 7 different musical instruments used, and 28 columns is 28 times of time block. The chart was filled with events followed by the equation $P_k = \frac{\lambda^k}{k!} \cdot \exp^{-\lambda}$. So 107, 65, 19, 4, 1 events were linked with P_0, P_1, \dots, P_4 . For instance, # of 'no events' is 107, and # of '1 event' is 65, etc. Mathematically, $107 \cdot 0 + 65 \cdot 1 + 19 \cdot 2 + 4 \cdot 3 + 1 \cdot 4 = 119$ events were scattered in 196 blocks. He tried to make distribution equally and tried to follow Poisson's law strictly, but aesthetic changes were allowed. One event has 2.5~6.5 sounds per measure, so 32.5 sounds were played averagely in 1 block. The author commented Xenakis's way of altering # of events corresponding to the probability P_k , and she preferred her way because it was simpler and well-distributed. But I can't tell which is better mathematically or aesthetically. First, the author explained how to generate the number of columns. The generation of the rows is the same way as that of the columns.

I understand that Xenakis's chart can be explained well through this process. But how will be the music? After many trials, I finally made mp3 file from the borrowed LP. The first impression of the song *Achorripsis* was weird. Keeping track of the number of events, the song was 'correct'. But it was not beautiful. It sounded like background music for a SF movie. But later on, after repeatedly listening to *Achorripsis*, I realized I am getting used to it and liked it! Most of all, the tracking of the chart made me realized how the tension of *Achorripsis* leads motives. For example, the big two blank columns and the next column (25th)'s busiest playing gave a contrast and anticipation. Timber choice was crucial in *Achorripsis*. Glissando of strings and simple repetitive percussion sounds also gives some great contrast to me as well. Aesthetically, his song seems too high to understand and enjoy it. Musically, it is interesting to generate tensional variations. I am sure that it is the perfect example that mathematically stable structure can give some great musical environment. Because we all know music is number.