

#1...

Ircam Conference
Sunday, March 13

10:15 AM:

Gilles Dowek Ecole Polytechnique :

He's basically an engineering, and seemed to approach everything musical from the standpoint of engineering. Began by talking about the construction of instruments that could play a 53-tone scale , thereby combining the violin with the piano. Evidently knew nothing of the work of Charles Ives, Harry Partch and I'm sure an equal number of French composers and instrument makers.

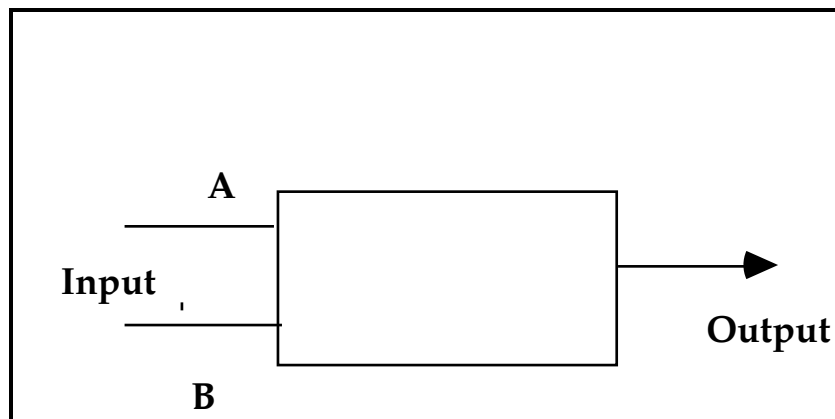
Kolmogorov definition of "complexity". Defined in terms of the size of the description (or the generating algorithm) rather than the size of the text. Interested in the "shortest description " needed to describe a musical composition.

Total randomness is reached when Kolmogorov complexity equals the length of the entire text!

Data; Lists = sequences of data; A string is an infinite list;

Functions map strings onto strings.

Automata: Black boxes with states:



#2...

One can mix the inputs A and B by some algorithm and assemble complex boxes. Application to music? Scores are discrete.

He's building a program for generating a score which is very long, of extremely low Kolmogorov complexity, and very boring. Beat patterns alternating in periods of 60:61.

Daniel Schell:

An American composer living in France for many years. His talk was a good deal more interesting. He's applying ideas of Operations Research to musical composition.

Uses Gaussian distributions of intervals to generate classes of "melodies". He then arranges them harmonically by vertical distributions which appear to be pervasively diatonic. He had an assistant with him who plays a very beautiful Indian flute.

Connections of voices are achieved through Operations Research: "Minimizing energy under constraints"

His pieces include A Traveling Musician; 10 Optimal Studies, and something that was played for us on the flute with recorded background: "Vocareaux", which sounded a bit like Messiah's flute piece, Corbeau Noir

Charlotte Truchet:

Introduced us to the methods of "Constraint Programming" which can be used to make software that is useful to composers.

"Non-parity rhythms". Binary rhythms with deviations in the cycle. Related to interesting musical patterns in musical of primitive societies

#3...

Example of constraint programming. A composer is writing a piece for guitar. He has in mind a certain chord and wants to know all the possible ways in which it can be fingered. As we know this is a difficult and frequently encountered problem. There are 3 constraints:

- (1) Is a certain chord playable at all?
- (2) How many ways are there if playing it?
- (3) Slow versus rapid chord changes, and what is possible.

Frank D. Valencia :

More on constraint programming, process calculus. Notation "P || G" : "P runs parallel with G" Thus, concurrent activities of the sort one finds in all the performing arts but mostly in musical counterpoint. His "process calculus" is designed to synchronize time constraints. (I gather that he's trying to generalize the concepts underlying harmony and counterpoint for more general purposes).

Elaine Chew Alexandre Francois, University of Southern California:

They've built a sort of computerized Helmholtz-type chord sensing instrument that in theory, can identify triads in a composition and represent them as colored geometric figures. We were given several demonstrations. It seems to have too great a delay time, and lingers on previous triads while a new one is being played. The instrument shown to us is a prototype only. More information about the ongoing status of their work can be found at:

<<http://www-rct.usc.edu/~mucoaco/MuSA.RT>

