

# Approaching Musical Actions

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Abstract

How can we model the kind of musical action taken by an agent such as an improviser or composer? I want to recontextualize toward a representation of music which is more temporal, more complex, and located firmly within musical action. We can just begin by thinking about mathematical action, which in fact does model Lewin's thing-to-thing transformational idea pretty well. You take one thing and transform it into another similar thing. But can't be the whole story. We need to follow up our idea of how to grow a piece larger from some representation of its earlier stage. For this, we need at least a representation that is complex enough to characterize a moment of music-til-now

First we define semigroup and monoidal actions and their relations to automata and to Lewin nets. We develop actions on Knets in detail, eventually presenting a full table of actions within the T/M group. The development generalizes to any modulus = ETS, and to actions on polysemic and non-commutative Nets.

We then develop an Eight-fold Way typology of different kinds of layered actions on different kinds of simple or complex objects; recursive actions are a special case of these. We briefly discuss some properties of the different kinds of layered action.

We end with some remarks tying together Nets, graphs, relations, spaces, and grammars, with a beginning of a formal semantics. (Left implicit are categories.) We illustrate how Isobel, our prototypical composer, could run the grammar machine and its submachine, the metagrammar of a particular proof-sequence within the grammar, to grow a piece larger in clear but nonobvious ways.