

The analysis of algorithmic music generated through physical embodiment

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v0.003

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pdf of the presentation is available at

<http://rheadley.net/presentations>

This presentation concerns creative projects involving the following aspects of the compositional process; in particular when using embodied interaction:

- the analysis of the (results of the) non-physical algorithm
- analysis of the (results of the) physical algorithm
- analysis of global structuring

and investigates the following:

key questions

- what is the level of algorithmic control: one single function or a multiplicity of interacting functions?
- what is the role of human agency?
- how important is it to seek to emulate 'standard' acoustic instruments and methods?
- what are the possibilities for shared or mediated interaction?

Nick Collins

“The Analysis of Generative Music Programs”

Organised Sound 2008

```

(
~synPianoDo = ({
var n;
n = 6; // number of keys playing
n.postln;
~synPiano = ({
  Mix.ar(Array.fill(n, { // mix an array of notes
    var delayTime, pitch, detune, strike, hammerEnv, hammer;
    pitch = (36 + 54.rand); // calculate delay based on a random note
    strike = Impulse.ar(0.1+0.4.rand, 1.0.rand, 0.1); // random period for each key
    hammerEnv = Decay2.ar(strike, 0.008, 0.04); // excitation envelope
    Pan2.ar(
      Mix.ar(Array.fill(3, { arg i; // array of 3 strings per note
        detune = #[-0.05, 0, 0.04].at(i); // detune strings, calculate delay time :
        delayTime = 1 / (pitch + detune).midicps; // each string gets own exciter :
        hammer = LFNoise2.ar(3000, hammerEnv); // 3000 Hz was chosen by ear..
        CombL.ar(hammer, // used as a string resonator
          delayTime, // max delay time
          delayTime, // actual delay time
          6) // decay time of string
      )),
      (pitch - 36)/27 - 1 // pan position: lo notes left, hi notes right
    )
  })
})
}).play
})
)

~synPiano.free; ~synPianoDo.value;
~synPiano.free;

```

- “the clearest expression of this task is to explain a given output (a production) in terms of the originating program (a source)”
- small demonstrations rather than compositions: a phrase, maybe - is this *enough*?
- code, pseudocode and spectrograms are provided, but interestingly no notation, so no explicitly musical analysis (random pitches)?

An alternative approach:

- embraces the complexities involved in human interaction and music (both through composition and performance)
- seeks to investigate these complexities using hybrid algorithmic, or generative methods
- compositional and performative complexities arise from practice and learning

In addition to the 'modalities' that are usually referred to as distinct media streams, for instance, audio and video: is the embodied a different modality as well?

In algorithmic music: how many rules control how many others? How many interleaved processes? What user interaction happens, and when? Are each of these modalities too?

How important is it to feel a strong analogue with reality, for instance with standard acoustic instruments? Much has been made of the 'magical' quality of certain technologies - what should the balance be between predictability and magic?

Examples of work with dancers and interfaces,
exploiting this sort of multi-modal approach:

HCI 2009



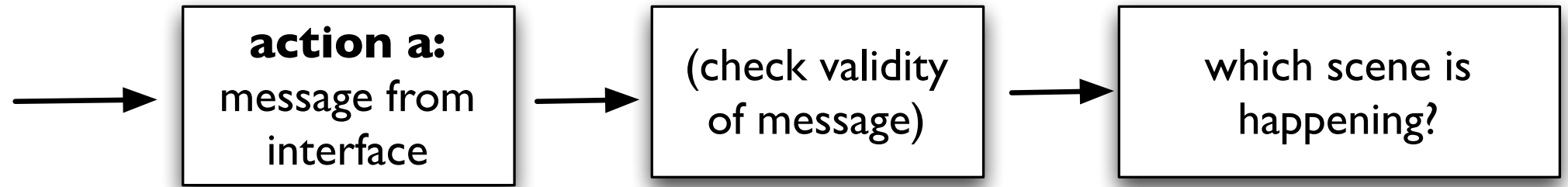
MIST 2010



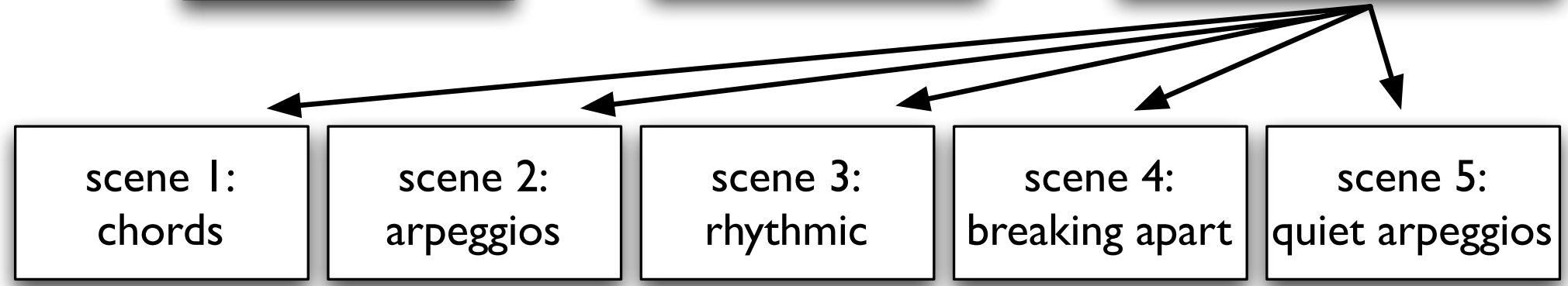
Triggered 2011, metapiano



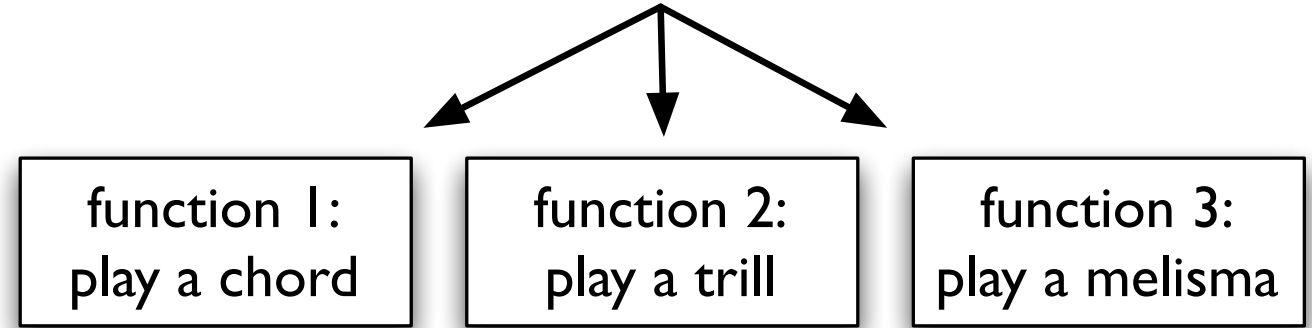
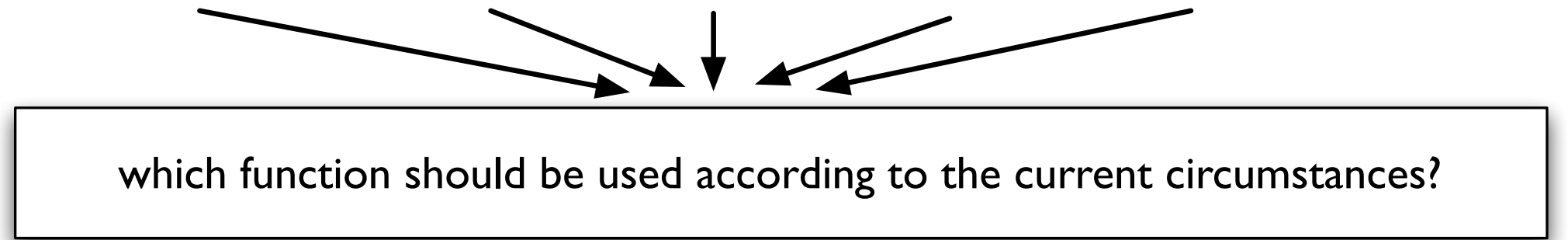
Top Level



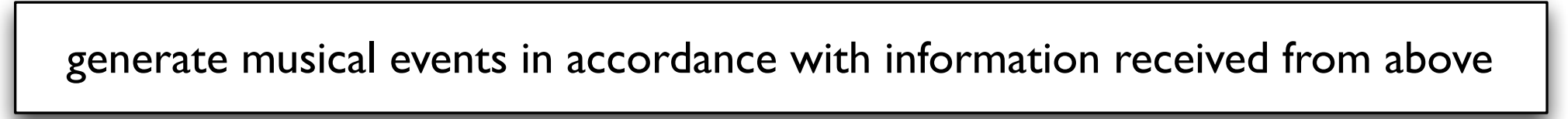
action b:
determines
which scene is
happening



Middle Level



Low Level



Thank you