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Dimitri Bouche, Jean Bresson

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Adaptive lookahead planning for performing music composition

Dimitri Bouche – Jean Bresson
UMR 9912 STMS IRCAM-CNRS-UPMC / Paris, France
{bouche,bresson}@ircam.fr

Context

- Creating music amounts to write (compose) and perform (live)
- Composition can last an indefinite time
- Performance has a timeline defined during composition

Adaptive lookahead (dynamic vs. static)

Dynamic object

Static object

likely to be modified while being rendered

will never change

Planning of a musical object

Dynamic lookahead extension

Plan « just in time » in a time-window

Possibility to extend this time-window

short anticipation

larger anticipation

Planning and scheduling operation scheme

Data structure

Object to plan

Editions

Notifications

Planner

Register playing objects

Store time-windowed plans

Extract new plans from the data structure according to queries or notifications

Scheduler

Synchronously render plans

Query the planner for new plans after depletion

Trigger compositional processes as « tasks »

Time updates (graphics, callbacks etc.)

Environment & Compositional Processes

- Computer-music environment: react to user inputs
- Process tasks: non preemptible, best-effort
- Integrate results in the data structure
- Notify the planner about editions

Example

Tasks triggering compositional processes

1 2 3 : Results of compositional processes

Download OpenMusic : http://repmus.ircam.fr/openmusic/

Efficace ANR-13-JS02-0004-01 : http://repmus.ircam.fr/efficace/