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Dimitri Bouche, Jean Bresson

To cite this version:
Dimitri Bouche, Jean Bresson. Adaptive lookahead planning for performing music composition. The 25th International Conference on Automated Planning and Scheduling (ICAPS), Jun 2015, Jerusalem, Israel. 2015. <hal-01163294>

HAL Id: hal-01163294
https://hal.archives-ouvertes.fr/hal-01163294
Submitted on 12 Jun 2015

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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

Planner

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

Scheduler

• Register playing objects
• Store time-windowed plans
• Extract new plans from the data structure according to queries or notifications

Example

Tasks triggering compositional processes

1 2 3 : Results of compositional processes