Adaptive lookahead planning for performing music composition

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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
- Likely to be modified while being rendered

Static object
- Will never change

Planning of a musical object
- Play-chord
- Play-note
- Note-on
- Note-off

Dynamic lookahead extension
- Plan "just in time" in a time-window
- Possibility to extend this time-window

Plan « just in time » in a time-window
- Short anticipation
- Larger anticipation

Planning and scheduling operation scheme

Data structure
- Object to plan
- Translation
- Plans

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

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.)

Example
- Tasks triggering compositional processes
- Results of compositional processes

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

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