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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

Compositional processes that generate or modify musical structures can be integrated in musical objects, and occur during the performance

Adaptive lookahead (dynamic vs. static)

Dynamic object
- likely to be modified while being rendered

Static object
- will never change

Planning and scheduling operation scheme

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.)

Data structure

Example

Notes: Tasks triggering compositional processes, 1 2 3: Results of compositional processes

Download OpenMusic: http://repmus.ircam.fr/openmusic/
EFFICAC(e) ANR-13-JS02-0004-01: http://repmus.ircam.fr/efficace/