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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 of a musical object

Dynamic lookahead extension

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

Possibility to extend this time-window
- Larger anticipation

Planning and scheduling operation scheme

Data structure

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

• Synchronously render plans
• Query the planner for new plans after depletion
• Trigger compositional processes as « tasks »
• Time updates (graphics, callbacks etc.)

Planner

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

Example

• Tasks triggering compositional processes
• Results of compositional processes

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