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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

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

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

Data structure

Planning of a musical object

Dynamic lookahead extension

Plan "just in time" in a time-window

Possibility to extend this time-window

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Example

1 2 3 : Results of compositional processes

Tasks triggering compositional processes

Example