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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

![Musical object planning](image)

#### Dynamic lookahead extension

- Plan « just in time » in a time-window
- Possibility to extend this time-window

#### Short anticipation

- Note-on
- Note-off

#### Larger anticipation

- Play-chord
- Play-note

### Planning and scheduling operation scheme

#### Data structure

![Data structure](image)

#### 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

![Example](image)

- Tasks triggering compositional processes
- Results of compositional processes

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