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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

Adaptive lookahead (dynamic vs. static)

Dynamic object
Static object
likely to be modified while being rendered
will never change

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

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