Graphical Temporal Structured Programming

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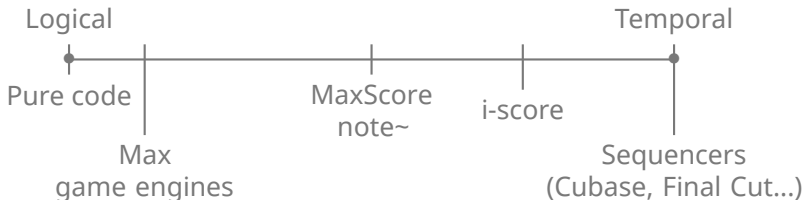
1: Blue Yeti
2: LaBRI
3: PoSET

Position

Authoring **interactivity** ?

When A then B : **programming**

Code-first environments.

Previous i-score version: **interaction points**.

Inspiration

Polyvalent structure:

- **Feldman**
  Intermission
- **Cage**
  Two
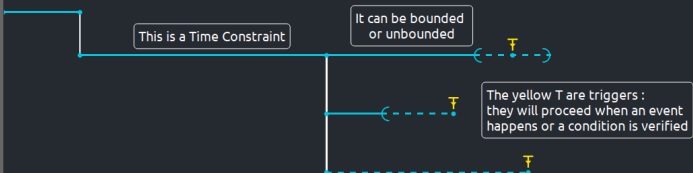- **Stockhausen**
  Klavierstück XI

High-level algorithms for the performer

Vocabulary

| 0:00.0 | 0:01.500 | 0:03.0 | 0:04.500 | 0:06.0 | 0:07.500 | 0:09.0 | 0:10.500 | 0:12.0 | 0:13.500 | 0:15.0 |

This is a Time Constraint

It can be bounded
or unbounded

T

The yellow T are triggers :
they will proceed when an event
happens or a condition is verified

T

T

In white : a Time Event.
Events can carry conditions
on the execution of
their successors.

In yellow, a condition

Both conditions will be evaluated
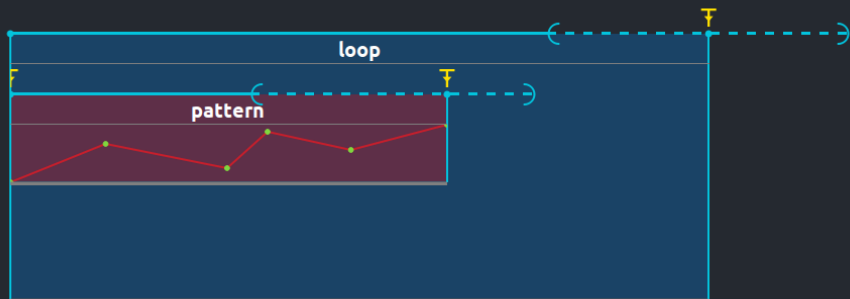at the same time.

In dark gray : a Time Node.
It goes all the way up behind the Time Event.
Everything on a same Time Node is synchronized.

MyConstraint

Inside a Constraint,
can live multiple processes

Loops

- ► Two interaction points.
- ► One time-constraint.
- ► Allows for `while` and `do-while`.

Data tree

Address	Value	Get	Set	Min	Max
▾ OSCdevice					
▾ ui					
focus	1	√	√	1	10
▸ master					
▾ layer					
mediaSet	0	√	√	0	8
media	999	√	√	0	999
▸ auto					
▸ transformer					
▾ transition					
duration...	false	√	√		
type	false	√	√		
duration	0,5	√	√	0	1
soundOutLi...	1	√	√	0	1
soundOutBa...	0,5	√	√	0	1
soundOutLe...	1	√	√	0	1
▸ movie					
▸ color					
▸ scale					
fieldOfView	true	√	√		
▸ rotation					
▸ pixelFX					
blendMode	0	√	√	0	5
record_stop...	false	√	√		
▸ position					
hidden	false	√	√		
alpha	1	√	√	0	1
▾ record					
eraseOn	false	√	√		

- **Abstraction** over multiple protocols.
  OSC, **MIDI**, **Minuit**, **HTTP**, **WebSockets**, **Serial port**, **Local intropsection…**
- **Data model** of (remote) applications.
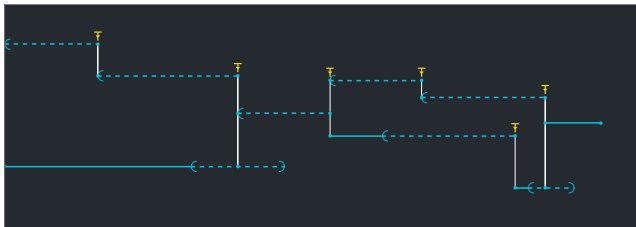- Can also be used as **local memory** for the score.

Code

i-score: **temporal language**.

- ▶ Unable to perform arithmetic computations alone.
- ▶ Only concerned by **temporal structure**.
- ▶ → Introduction of an embedded language to perform this work.
- ▶ Javascript fits the bill.

Imperative vs event-driven
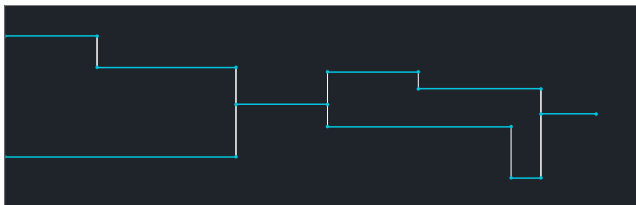
A *then* B

B *when* A

Playhead semantics

Demo

icmc.blueyeti.fr

Future

- ► For the sake of completeness : dynamic allocation primitives.
- ► Integrated input recording.
- ► Real-time audio input delaying and reuse.
- ► Deep MIDI integration, piano roll, etc.
- ► Hierarchic temporal signatures.
- ► Spatialisation ?

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P. Baltazar, T. de la Hogue, and M. Desainte-Catherine, "i-score, an interactive sequencer for the intermedia arts," in *Proceedings of the ICMC - SMC 2014 Joint Conference*, 2014.

S. Letz *et al.*, "The libaudiostream library, 2012."

J.-M. Celerier, P. Baltazar, C. Bossut, N. Vuaille, J.-M. Couturier, and M. Desainte-Catherine, "Ossia : Towards a unified interface for scoring time and interaction," in *TENOR: First International Conference on Technologies for Music Notation and Representation, Paris, France*, 2015.

J. Arias, M. Desainte-Catherine, and S. Dubnov, "Automatic construction of interactive machine improvisation scenarios from audio recordings," in *The Fourth International Workshop on Musical Metacreation (MUME 2016)*, 2016.

T. De La Hogue, J.-M. Celerier, and P. Baltazar, "Présentation d'un formalisme graphique pour l'écriture de scénarios interactifs," in *Journées d'Informatique Musicale*, 2016.

Links

- **i-score** : www.i-score.org

Thanks ! Questions ?

Uses the Beamer 'simple' theme, Facundo Muñoz; and Mozilla's Fira font family