Graphical Structured Temporal Programming for Interactive Applications

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ABSTRACT

The development of interactive shows and interactive user interfaces for arts & exhibitions has traditionally been done with tools that pertain to two broad metaphors. Cue-based environments work by making groups of parameters and sending them to remote devices, while more interactive applications are generally written in domain-specific programming environments, like Max/MSP, Processing or OpenFrameworks. In this paper, we argue about the specific issues that arise in such environments, and we present i-score : an extensive and collaborative software suite that bridges the gap between time-based, logic-based and flow-based interactive application authoring tools. This is done in a single cohesive graphical user interface, built upon a few simple and novel primitives. i-score allows the creation of software meant for operation in a large parameter space, and enables artists to express easily both temporal logic and structured programming, with facilities for automating and applying transformations to single and multi-dimensional parameters.

Author Keywords

Guides; instructions; author's kit; conference publications; keywords should be separated by a semi-colon.
Optional section to be included in your final version, but strongly encouraged.

ACM Classification Keywords

H.5.m. Information Interfaces and Presentation (e.g. HCI): Miscellaneous

See: `http://www.acm.org/about/class/1998/` for more information and the full list of ACM classifiers and descriptors.
Optional section to be included in your final version, but strongly encouraged. On the submission page only the classifiers letter-number combination will need to be entered.

INTRODUCTION

This paper presents a paradigm that aims to allow non-programmers to conceive interactive applications easily and execute them in production.

The existing software stack is either oriented too much towards the cue paradigm, which is useful as long as there is no complex logic involved, or towards the programming paradigm, where it is hard to write simple scenarios like "move a spotlight in horizontal oscillation for ten seconds; after the first 5 seconds, if a dancer jumps on the stage, play a sound and increase reverberation steadily as long as the dancer is on stage". interactive applications easily for non-programmers, and

Motivation

The need for authoring software able to operatoe in both the temporal and logical domains arises as soon as an artist wants to set-up a show which may have different outcomes according to the actions of the performer, or even of the participants.

Use cases

To explain properly the kind of artistic demeanors we are working with, there will be three case studies.

The Drop

Stockhausen, Klavierstucke XI

The Runner

This is an actual museum installation that is located in the Futuroscope, at the city of Poitiers in France.

Existing approaches

Content creation

Flash, Processing, OF, domain-specific software...

Flow control models

Max, PureData, React.[...], Integra Live (qui est plutt orient son), Unity & envs de jeu, etc. (revoir slides), Chronic (cf. tlchargements), OpenMusic, Antescofo (et Ascograph), logiciels de la confrence sur appli ractives (cf. slack).

Document models and application description

CORBA, DBus, DOM HTML, DOM Qt, DOM Jamoma...

A MODEL FOR ORCHESTRATION

We will present our constructs by starting with the purely temporal ones, and by extending to the more logical aspects.

Specification of temporal relationships

- Duration - Synchronization

- Mettre le tableau qui montre les problmes avec les graphes qui s'interposent (en partant des petits schmas)

Structured temporal programming

- Conditions and trigger of synchronizations

Building from it : - Loops (because interpreter works like a playhead). -¿ parler des diffrentes possibilits que a ouvre : * Canons * Fractales * etc..

FROM STRUCTURE TO CONTENT

- Processus - Hirarchie (qu'on a dj prsent).

- Paramtres : actuellement, scope global Puis scope local dans la hirarchie ? -¿ rejoint la programmation structure via les donnes

Perspective : transformations appliques une bote

- Questions de synchronisation d'tats (avant / pendant / aprs)

- Passage de messages pour contrle interne ou externe

- Automations

- Mappings 1D

- Mappings n-D

- Conclusion : analogue un petit OS spcialis pour applications multimdia.

SHORTCOMINGS (ET PISTES)

Debugging

- Getting execution traces -¿ How to go at any point in the flow of a software ? The external state might not be correct. (Conoundrum of "instant debugging" but requiring for instance a smoke machine to spit smoke for ten minutes)

- Visualisation / simulation du rsultat ?

EVALUATION

- Time to develop artistic installations greatly reduced.

CONCLUSION