

Submission for a workshop – Pure Data mini-Conference

Understanding and being creative with Pure Data's data structures

João Pais

Contact address:

João Pais
Friedenstr. 58
10249 Berlin
+49 30 42020091
jmmmp@gmx.net
www.endphase.net

"The original idea in developing Pd was to make a real-time computer music performance environment like Max, but somehow to include also a facility for making computer music scores with user-specifiable graphical representations. ... Pd is designed to offer an extremely unstructured environment for describing data structures and their graphical appearance. The underlying idea is to allow the user to display any kind of data he or she wants to, associating it in any way with the display."

Miller Puckette, *Using Pd as a score language* (2002).

Pure Data's data structures are one of the few core features that distinguish Pd from Max/MSP. Yet, they're also one of the few libraries which are used solely by a small group of users. The main reasons for this would be both the not yet very mature and complete collection of objects, as well as with the not very intuitive implementation in Pd's language. In the end, this very powerful feature becomes (unnecessarily) too complicated to use.

This workshop is dedicated to show the possibilities of Pd's data structures as a fruitful companion to any Pd user interested in a closer and more flexible interaction with the graphical representation of data.

The workshop is divided in two parts. The first part is dedicated to explain how to program with data structures (also covering some of the shortcomings of its implementation). The second part goes through several examples of data structures on "real life" situations, starting with simple display and control examples, and ending with complex patches to control / generate music in realtime (thus fulfilling the objective expressed by M. Puckette in the initial statement).

If time allows, an optional third part would be devoted to working hands-on with data structures: either by adapting the given examples, or by implementing ideas brought by the participants.

After attending this workshop, it should be clear for the participants on how to program with data structures, and how to approach them in a personal way, in order to integrate them in your own patches.

Technical requirements

- Stereo PA System
- Video projector and projection canvas

“Understanding and being creative with Pure Data’s data structures” – Workshop structure

Part 1 – Implementation of data structures in Pd

- basics of the data structures implementation
- list and categories of objects
- how to create a structure and store data
- how to display data
- how to edit data
- managing data: interaction techniques between storage, editing and display
- modularity: dynamic patching, adapting to your needs
- shortcomings of the current implementation of data structures, and techniques to surpass them

Part 2 – Using data structures: analysis and expansion of several “real world” examples

[The following list is a selection of an open list, which is in constant actualisation]

Data structures as a control language

- Display of 1-dimensional parameters (midi faders, sliders, etc.)
- Display of 2-dimensional parameters (space representation, etc.)
- A step sequencer (e.g. for your Monome)
- ...

Data structures as a GUI language

- Expanding your GUI atoms with data structures and GOP
- J. Wilkes: ds-bns abstraction
- J. Pais: A step-limited editable array
- J. Pais: Bezier transform function
- ...

Data structures as a score language and composition tool

- J. Pais: temporal proportion display patch
- M. Puckette: sequencer example patch
- H.-C. Steiner: Solitude
- G. Werner: Weird stave
- J. Pais: Event recorder in score style
- J. Pais: Score composition and performance patch
- ...

Teacher

João Pais studied composition in Lisbon, London and Freiburg (m. spahlinger) as well as electronic music (Mesias Maiguashca and Orm Finnendahl). From 2003–05 he was a tutor in the electronic music studio in the Musikhochschule Freiburg. Pais has continued his education with courses in Lisbon (Emmanuel Nunes), Paris-IRCAM (Salvatore Sciarrino), and Darmstadt (Germany).

Between 1997–2001, with colleagues Diana Ferreira and Luís Antunes Pena, Pais founded and directed the Jornadas Nova Música in Aveiro, Portugal, a festival dedicated to new music.

With Alberto C. Bernal and Johannes Kreidler / Enrique Tomás, Pais plays in the electronic improvisation trio Endphase, which already presented itself in many countries in Europe and China. In the Endphase Workshops Pais uses Pure Data.

Pais is a Pure Data user for many years, and is also active in the development – jmmmp abstractions, embedded in Pd-Extended –, in the documentation – FLOSS Manuals’ object list (among other chapters) –, and in the dissemination –through his Endphase workshops, and through the organisation of the Pd-Berlin user’s group – of Pure Data.

Pais uses Pure Data for his performances, as well as for his everyday sound processing and composing work. Lately he is also involved in developing several tools for both electronic as well as acoustic musicians (audio tester, ardour+jack control patch, Click Cracker, ...).

Pais currently lives in Berlin.

Links

Pais’ Pd page - <http://puredata.info/Members/jmmmp>

Click Tracker software – <http://puredata.info/Members/jmmmp/click-tracker>

Pd-berlin Users Group - <http://puredata.info/community/organization/pd-berlin/pd-berlin-users-group>

Endphase Laptop Trio - <http://www.endphase.net/>

Pure Data FLOSS Manual - <http://en.flossmanuals.net/puredata>

FLOSS Manual object list - <http://en.flossmanuals.net/PureData/ObjListIntroduction>

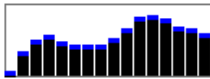
jmmmp abstractions – [pd]/extra/jmmmp in Pd-Extended, or

<https://pure-data.svn.sourceforge.net/svnroot/pure-data/trunk/abstractions/jmmmp/>

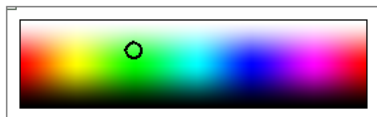
Patch illustrations

Here follows some pictures of my patches to be analysed:

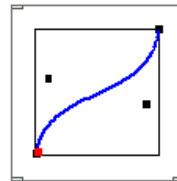
Slider display:



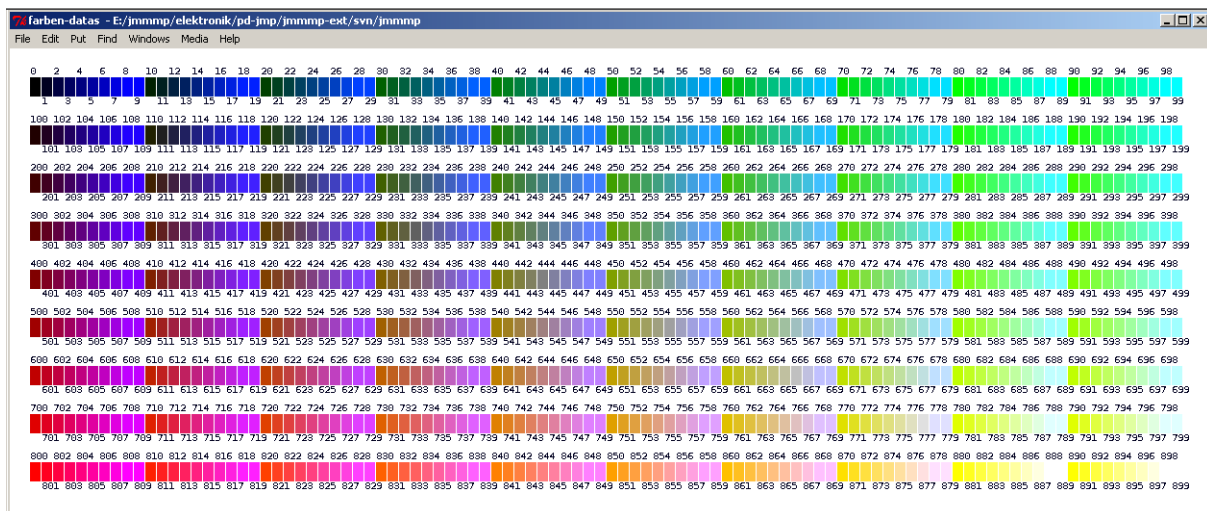
Swatch-style color selector



Bezier transform function

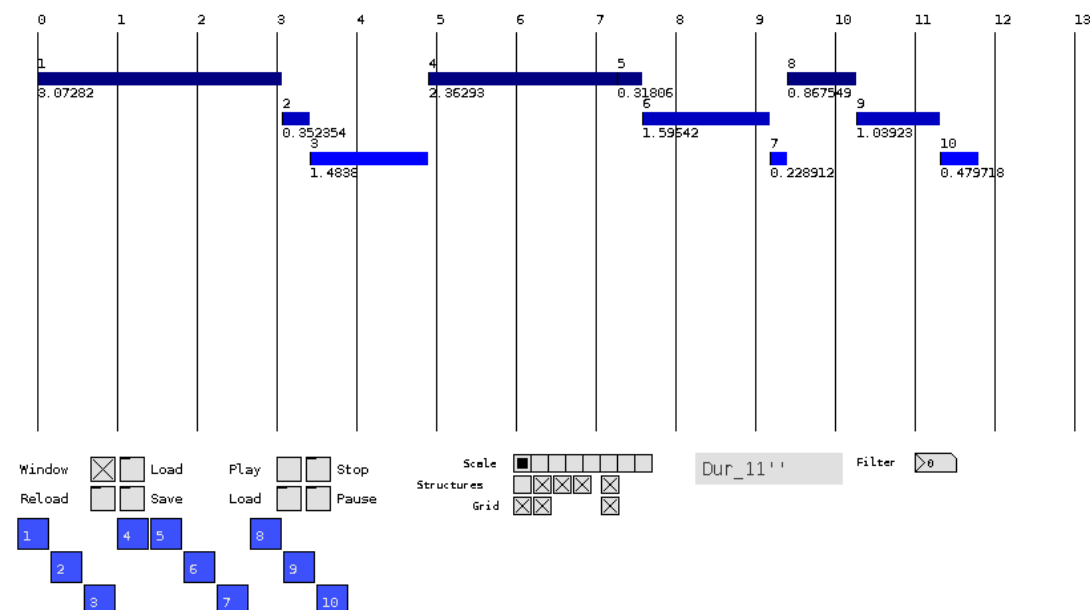


Color palette for data structures

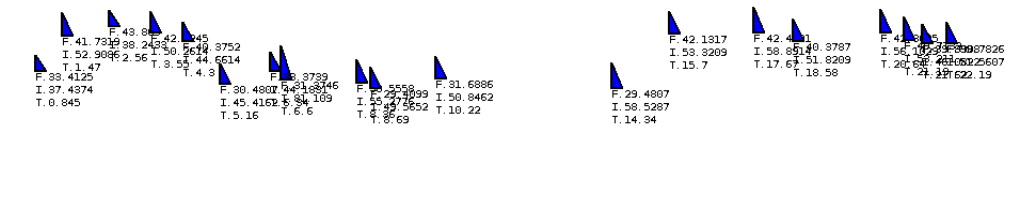


Temporal proportion display patch

form.test



Event recorder in score style



Score composition and performance patch

