PROGRAMMING MUSIC AND SYNTHESIZERS ON-THE-FLY WITH PHARO

Domenico Cipriani - ADC25

AGENDA

1. Foundations [45 minutes]
2. Rhythm and Melodies (75 minutes]
3. Sound Design with Phausto [75 minutes]
4. Performance [20 minutes]
5. Visual Interface and Control [25 minutes]

PART 1 :
FOUNDATIONS

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What is live coding?

- **Live coding means writing and modifying code in real time to create music, visuals, or performances.**
- **The code itself becomes part of the live performance, often projected for the audience to see.**
- **It’s about improvisation and creativity — composing and changing sounds or visuals on the fly.**
- Common in **electronic music and audiovisual art**, using languages like **SuperCollider, TidalCycles, or Sonic Pi.**
- Focuses on **process over perfection** — the act of coding *is* the art.

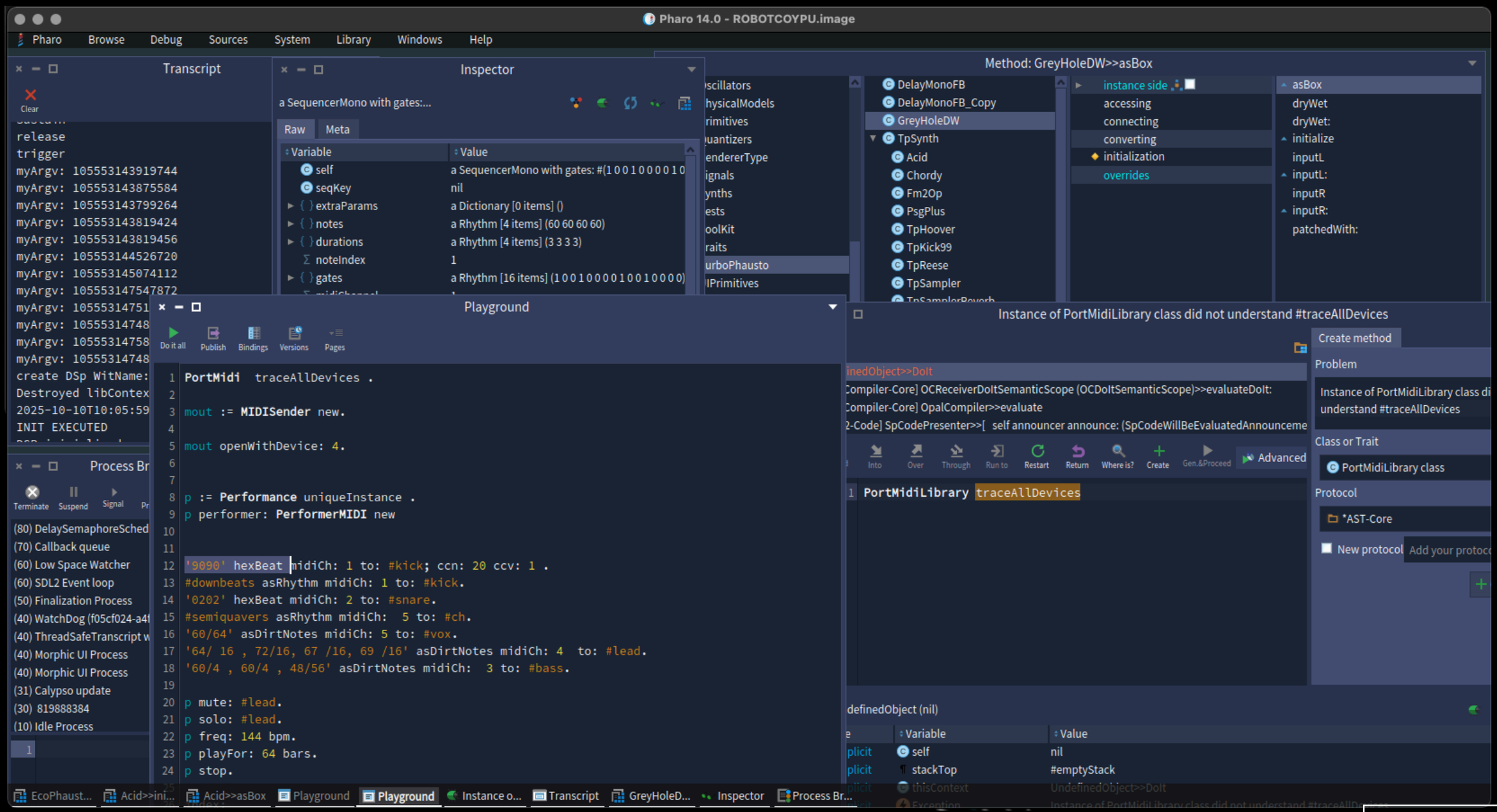
Install Pharo

Download the Pharo Launcher to download a Pharo Image:

https://pharo.org/download

A Pharo image is an object space + Pharo Core Libraries + the virtual machine

The Pharo IDE



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Made FAUST With

Pharo syntax on a postcard

- Everything is an Object.
- Every object is an instance of a class.
- Every class has a superclass.
- Object only communicates between them by sending messages
- Methods look-up follows the inheritance chain.
- The class Object is at the beginning at the inheritance chain and defines almost 400 methods.

Pharo syntax on a postcard

- POSTCARD IMAGE

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Installing Coypu and Phausto

Go to the *Coypu* GitHub repositories:

https://github.com/lucretiomsp/Coypu

Copy the *Metacello* script into your *Playground*.

```
Metacello new
    baseline: 'Coypu';
    repository: 'github://lucretiomsp/coypu:master';
    load
```

Select all the text and evaluate (CMD/CTRL + D).
Coypu* already comes together with *Phausto

PART 1 :
FOUNDATIONS

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Coypu's anatomy

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Connecting with audio servers

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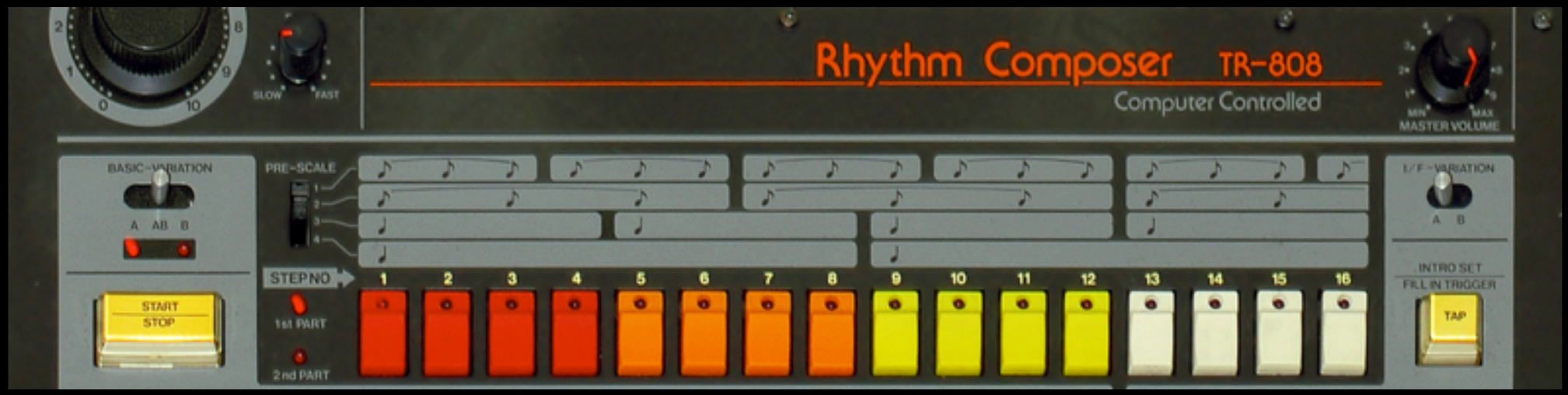
Creating rhythms



A rhythm can be represented as an array of 0s and 1s, where each 1 represents a trigger.

- **BINARY:** 100010001000
- **HEXADECIMAL:** 8888
- **PHARO:** #(1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0)
- **COYPU:** '#downbeats' asRhythm
- **COYPU:** 16 downbeats
- **COYPU:** '8888' hexBeat

Creating rhythms

- #(1 0 0 1 0 0 0 1 0 0 1 0 1 0 0 0)
- #rumba asRhythm
- **LIVECODINGTALK:** ‘9128’ hexBeat

- #(1 0 1 0 1 0 1 0 1 0 1 0 1 1 1)
- 12 quavers, 4 semiquavers
- ‘AAAF’ hexBeat

The ‘musky’ notation

PART 3 :
SOUND DESIGN WITH PHAUSTO

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Start your engine

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Let’s build a synth

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Drive Phausto with Coypu

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Build your own library

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PART 4 :
PERFORMANCE

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PART 5 :
VISUAL INTERFACE

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