

# Pharo news

Consortium.pharo.org

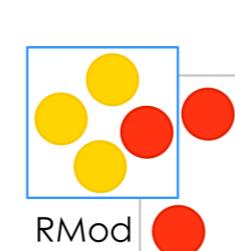
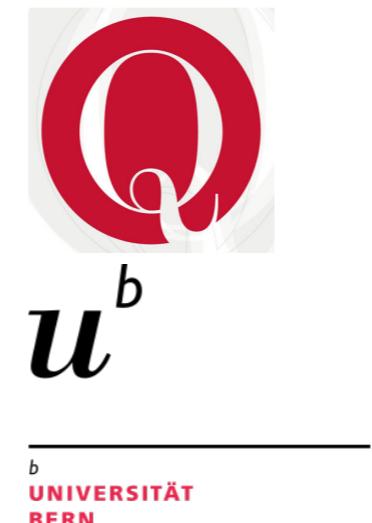
<http://www.pharo.org>



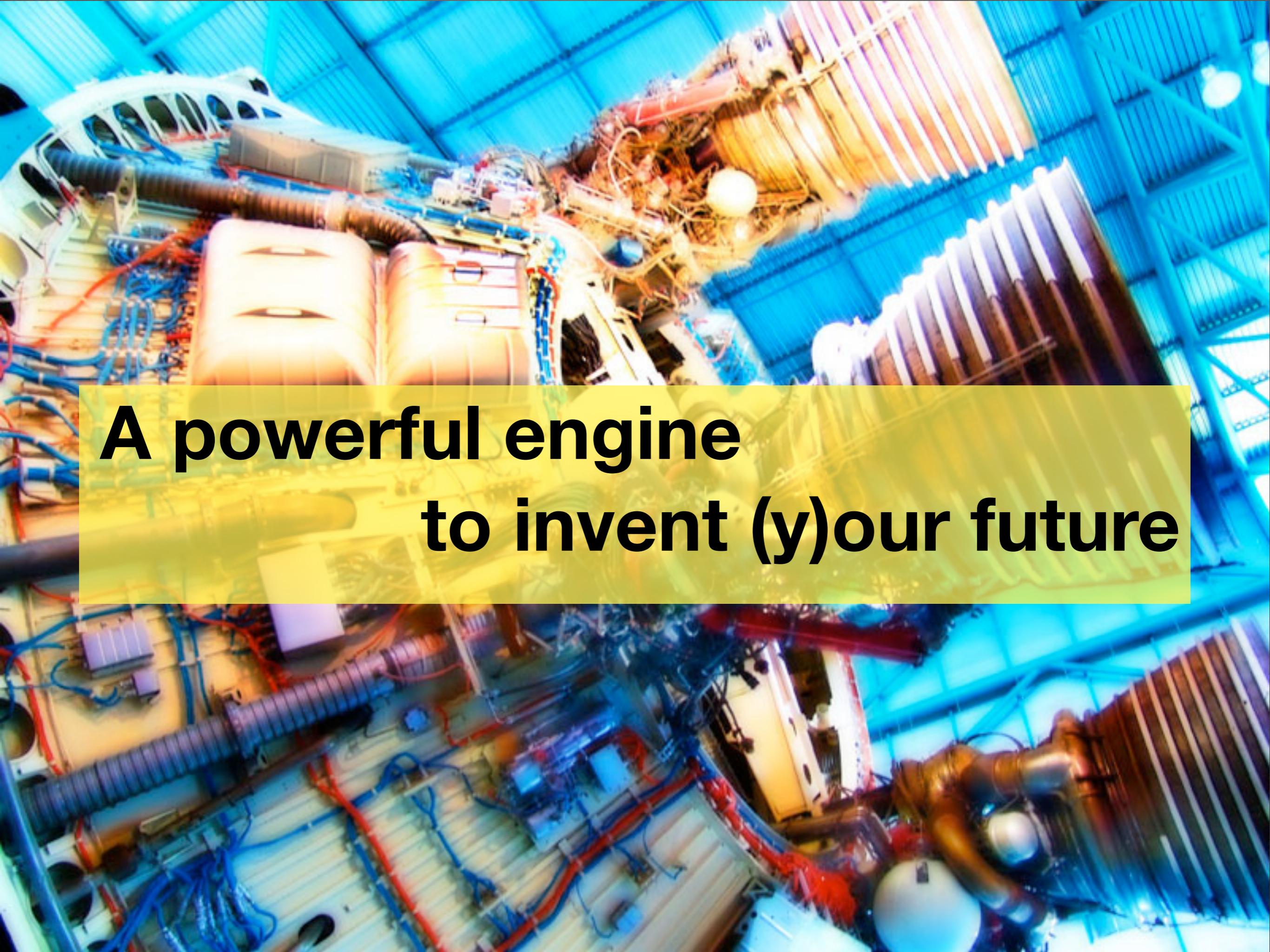
inspired!



feenk



You may remember...



A powerful engine  
to invent (y)our future



An ecosystem where  
innovation/business bloom

# More Pharo's Teachers

- Uni. of Buenos Aires • Uni. of Bern • Uni. of Maroua • Uni. of Brussels • Ecole des Mines de Douai • Uni. de Savoie • Ivan Franko Nat. Uni. • Czech Technical Uni. • CULS Prague
- Uni. of Quilmes • Uni. of La Plata • Northern Michigan Uni. • Uni. Technologica Nacional (UTN) • Uni. Catholic of Argentina • Uni. of Santiago • Uni. Policnica de Catalunya • Uni. de Bretagne Occidentale • Uni. of Tomsk • Uni. of Fernhagen • IT University of Copenhagen • Uni. Cat del Sacro Cuore of Brescia • Uni. of Yaounde • Uni. of Saint-Louis • Uni. of Lomé • INFI • Uni. of Lyon • Uni. of Cagliari • Uni. of Cordoba



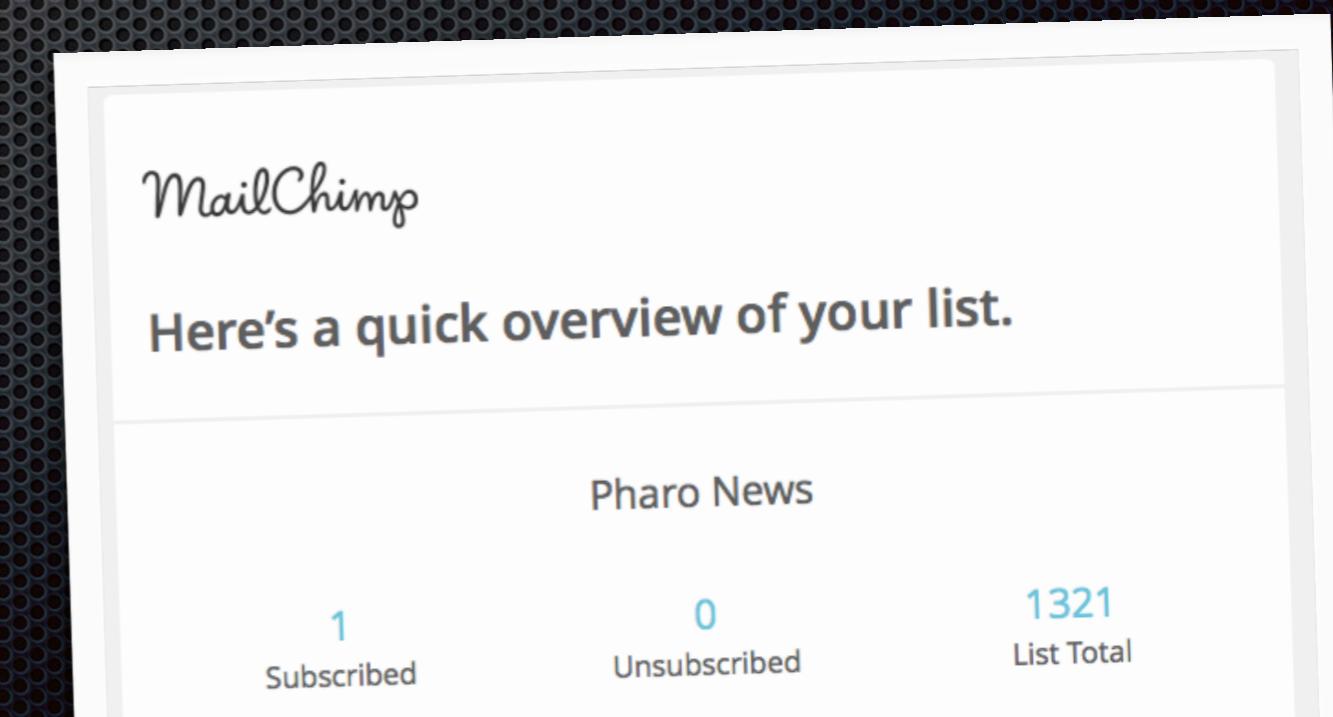
# More Tweets, blogs, buzz

- Pharo 3,904 tweets / 1,485 followers
- S. Ducasse tweets 1265 / 1083 followers
- S. Stinckwich 15.7K / 1506 followers
- Moose 998 tweets / 506 followers
- Youtube Pharo smalltalk: about 1540 videos!

# Kind of a dream

Only one mail per month!

1300 happy subscribers



# Blogs

- <http://pharo.org/blogs>
- <http://astares.blogspot.co.uk>
- <http://clementbera.wordpress.com>
- <http://pharoweekly.wordpress.com>
  - Guille Polito, [Playing with Objects](#)
  - Mariano Martinez Peck, [Sending messages](#)
  - Igor Stasenko, [Computer Adventures](#)
  - Laurent Laffont, [MaGaLoMa](#)
  - Esteban Lorenzano, [The Martian Chronicles](#)
  - Tudor Girba, [Humane assessment](#)

# More Contributors

Over 100 contributors  
for Pharo 5.0

**\*\*THANK\*\* YOU ALL !!!**

There are more and more people that we  
never met!

We need to drink a beer with you:)

# More Research Groups

Lafhis (AR)

Software Composition

Group (CH)

CAR (FR)

RMOD (FR)

Ummisco (IRD)

Reveal (CH)

CEA-List (FR)

Uqbar (AR)

Lab-STICC (FR)

IGEVET (AR)

Pleiad (CL)

Rych (CL)

OC (FR)

CCMI-FIT (CZ)

ASERG (BR)

AgileGroup (IT)

# LabWare Consortium Matching Campaign

Any participation to the consortium will  
be doubled by LabWare, Feenk,  
ObjectProfile!

[http://consortium.pharo.org/web/  
Membership](http://consortium.pharo.org/web/Membership)

[ You may remember... ]



Pharo is (y)our vehicle

Pharo is  
yours



Pharo is not perfect

But \*\*every\*\* single day we improve it

Yes you can have an  
impact in 1h per week

# New books!!!

- Numerical Methods in Pharo Tx D. Besset
- Entreprise Pharo: a Web Perspective
- Soon “Updated Pharo by Example”
- Soon TinyBlog : a Web Tutorial (FR/EN)

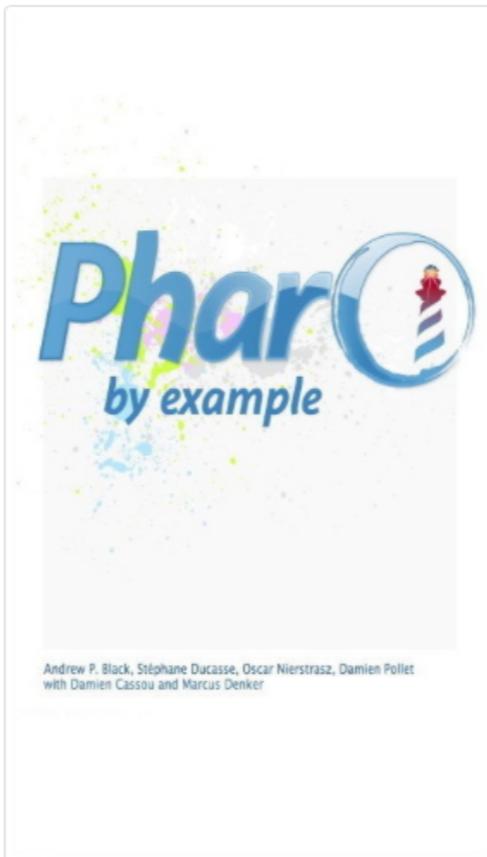
<http://books.pharo.org>

# Pharo Books

Pharo is a clean, innovative, open-source, live-programming environment.

Contribute to the SquareBracketsAssociates community free books  
<https://github.com/SquareBracketAssociates/>

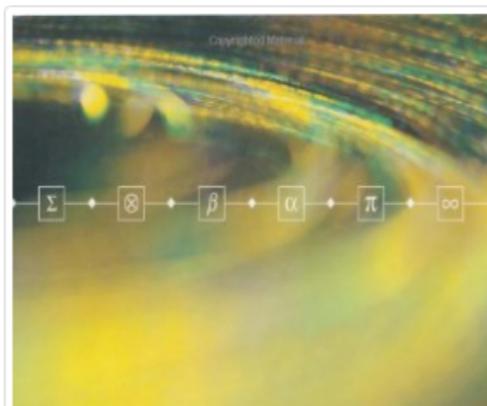
Access the book compilation farm!



Andrew P. Black, Stéphane Ducasse, Oscar Nierstrasz, Damien Pollet  
with Damien Cassou and Marcus Denker

*Pharo by Example*, intended for both students and developers, will guide you gently through the Pharo language and environment by means of a series of examples and exercises.

[View details »](#)



*Deep into Pharo* is the second volume of a series of books covering Pharo. Whereas the first volume is intended for newcomers, this second volume covers deeper topics.

[View details »](#)



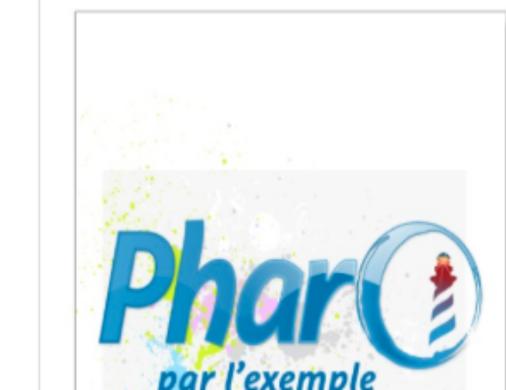
Damien Cassou  
Stéphane Ducasse  
Luc Fabresse  
Johan Fabry  
Sven Van Caekenbergh  
and many others

**a WEB perspective**

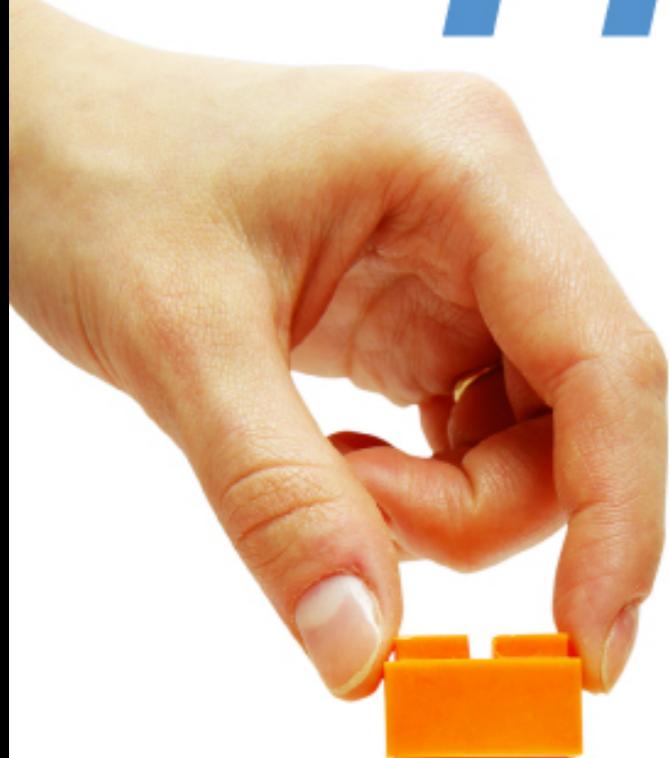
*Enterprise Pharo* is the third volume of the series. This book covers libraries and frameworks for enterprises, and in particular those doing web development.

[View details »](#)

TinyBlog: Un Tutorial Web en Pharo



# ENTERPRISE Phar



*Damien Cassou  
Stéphane Ducasse  
Luc Fabresse  
Johan Fabry  
Sven Van Caekenbergh  
and many others*

a WEB  
perspective

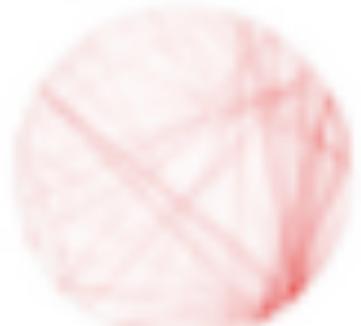
on Sale @ ESUG

## Agile Visualization

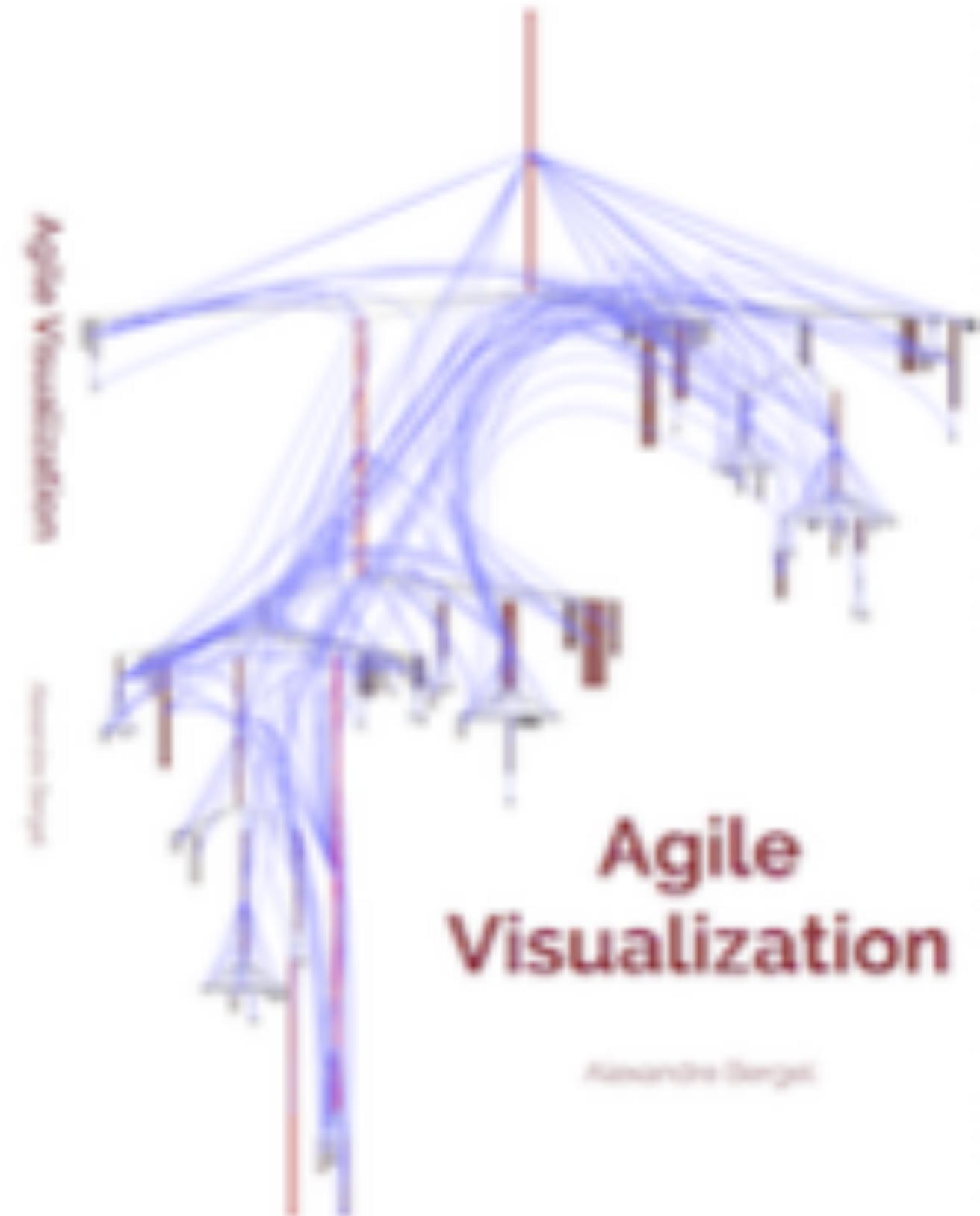
Creating a visualization requires short and incremental developments, often carried both in time and after. Agile visualization provides the use of the Scrum and Kanban iterative development environments to significantly reduce the creation of a visualization. Hence, significantly reducing a visualization development against traditional modeling frameworks and tools.

On Sale @ ESUG

Agile Visualization allows analysts that are relevant to practitioners, students and researchers to successfully design and implement a visualization.



Agile Visualization is focused on the analysis and visualization of the elements of data. Agile Visualization also has the ability to analyze and measure the different stages of creating and defining visualizations, such as planning, prototyping, testing and data validation.



# Pharo MOOC on FUN

- 3000 registered people
- Around 300 finished all the exercises and got a credit
- Not sure we will do another iteration

<http://MOOC.Pharo.org>

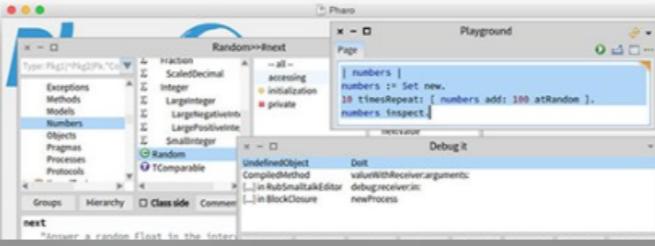
- Everything is in Creative Commons
- 7 weeks / 1h videos a week
- 60 lectures/videos + 30 interactive videos
- Exercises + Challenges + Mini Projects
- subtitle: eng/french/(spanish we are looking for subwriters)

# <http://MOOC.Pharo.org>

The Pharo MOOC

The immersive programming experience

Pharo is a pure object-oriented programming language *and* a powerful environment, focused on simplicity and immediate feedback (think IDE and OS rolled into one).



00:00 -0:34

## About this course

If you are either a beginner or an expert in object-oriented programming, this MOOC will change the way you program with objects: come and learn or rediscover object-oriented programming with Pharo! [more...](#)

## Download Pharo

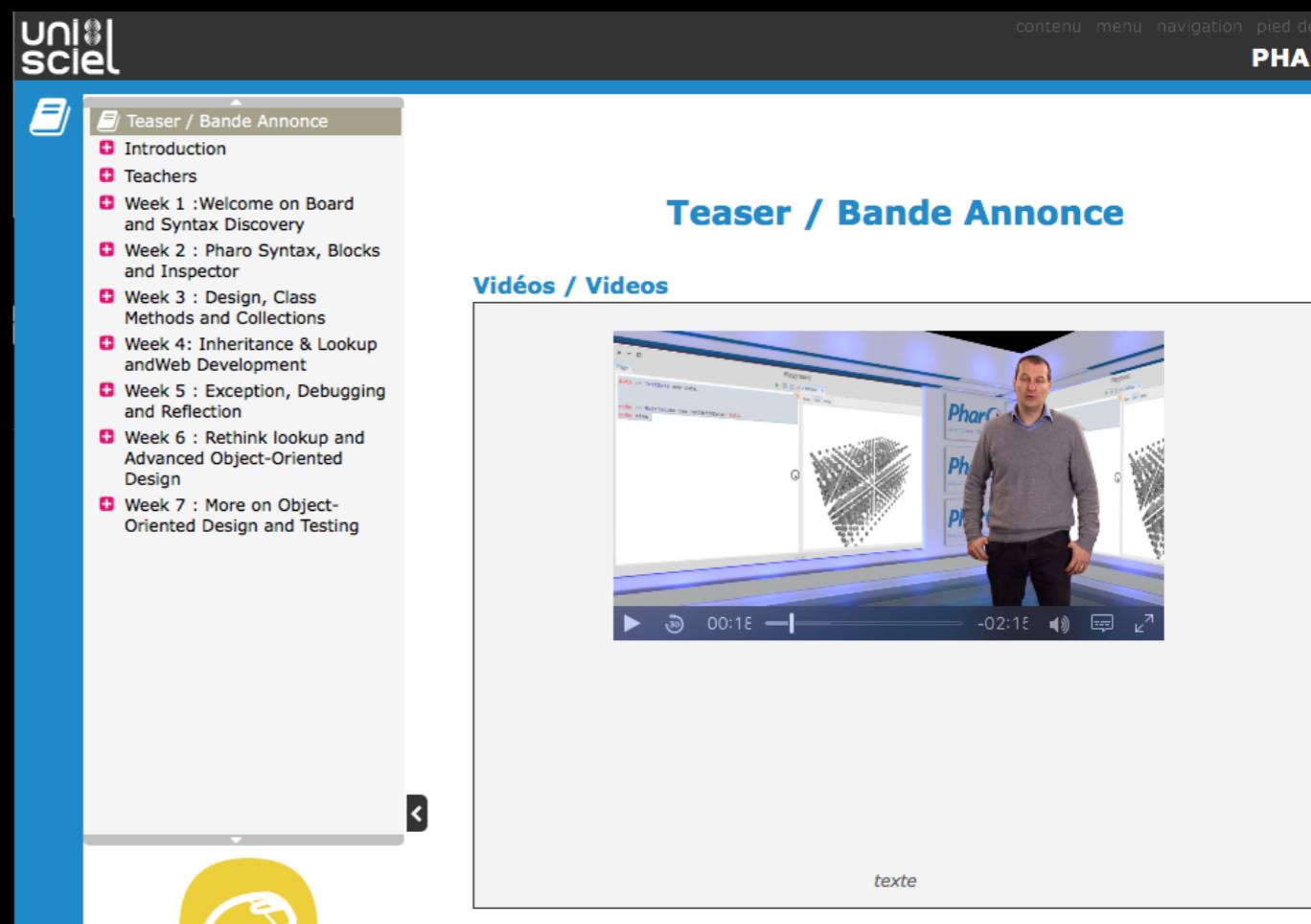
To get a version of Pharo ready for the MOOC, please follow these steps:

1. Download and install the [Pharo Virtual Machine \(VM\)](#)  
Only for **linux users** (tested on Unbutu 16.04):  

```
sudo dpkg --add-architecture i386
sudo apt-get update
sudo apt-get install libx11-6:i386 libgl1-mesa-glx:i386 libfontconfig1:i386 libssl1.0.0:i386
curl http://get.pharo.org/vm50 | bash
# you now have a pharo-ui script in the current folder to launch pharo images
```

# Pharo Starter Kit

- One USB Stick
- \*\*EVERYTHING\*\* packaged and ready



# Pharo5.0



A Major Release

# A Major Release

- Cog + Spur
- Complete New uFFI (compatible with NB)
- Many improvements
- New tools
- Massive cleaning

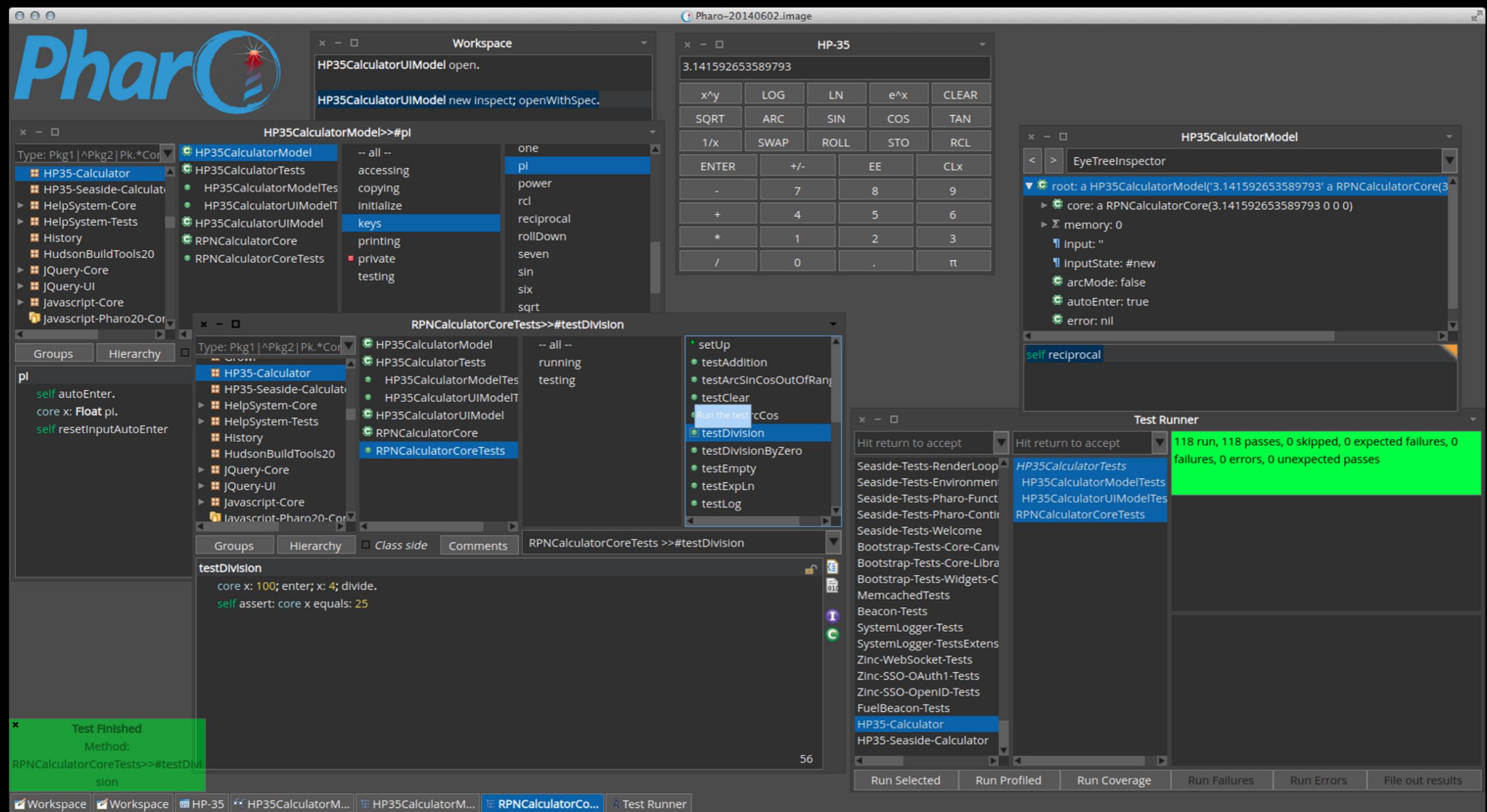
# Pharo5.0

- Released Spring 2016
- >1700 Issues closed

# ‘Small’ stuff... Updates

- Improved Refactorings (Tx Mark)
- OSSubprocess (Tx Mariano)
- Quality Assistant (Tx Yuriy)
- Breakpoints (Tx Marcus)
- Rubric for Text (as a way to go to TxText (Tx Alain))
- 6MB Deployment Image (Tx Pavel/Guille)
- Browser and Tool cleanups (Tx Nicolai)
- New bytecode set (Tx Clément/Eliot)
- Compiler enhancements (Tx Marcus/Clement)

# Dark Theme2

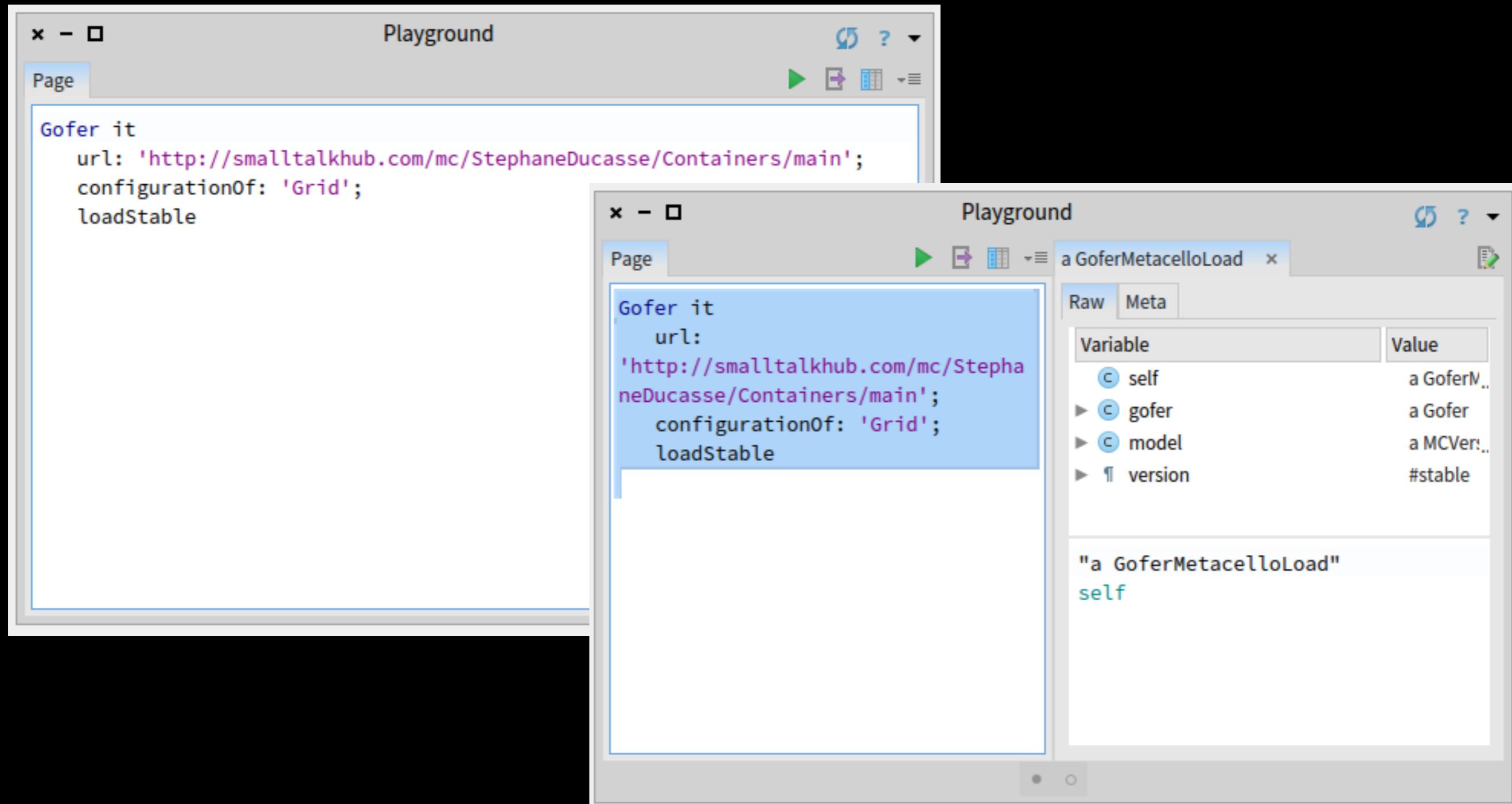


# GT Tools

- Start to replace old tools
- Workspace + Inspector + Spotter

<http://gt.moosetechnology.org>

# Playground: Workspace on steroids



GTInspector:  
empower you to revisit your  
interaction with your objects

x - □

## Inspector on a Point class (Point)

✖

a MethodDictionary [99 items] (#\*-&gt;Point&gt;...)



Items Raw Meta

Key	Value
#x	Point>>#x
#theta	Point>>#theta
#quadrantOf:	Point>>#quadrantOf
#onLineFrom:to:within:	Point>>#onLineFrom:to:within:
#bitShiftPoint:	Point>>#bitShiftPoint:
#<	Point>>#<
#scaleFrom:to:	Point>>#scaleFrom:to:
#sideOf:	Point>>#sideOf:
#'\\'	Point>>#'\\'
#scaleTo:	Point>>#scaleTo:
#grid:	Point>>#grid:
#'//'	Point>>#'//'
#asIntegerPoint	Point>>#asIntegerPoint
#directionToLineFrom:to:	Point>>#directionToLineFrom:to:
#r	Point>>#r
#angleWith:	Point>>#angleWith:
#isInsideCircle:with:with:	Point>>#isInsideCircle:with:with:
#'>='	Point>>#'>=
#negated	Point>>#negated
#translateBy:	Point>>#translateBy:
#squaredDistanceTo:	Point>>#squaredDistanceTo:
#flipBy:centerAt:	Point>>#flipBy:centerAt:
#octantOf:	Point>>#octantOf:

50 / 99

enter search query

a CompiledMethod (Point&gt;&gt;#scaleTo:) ×

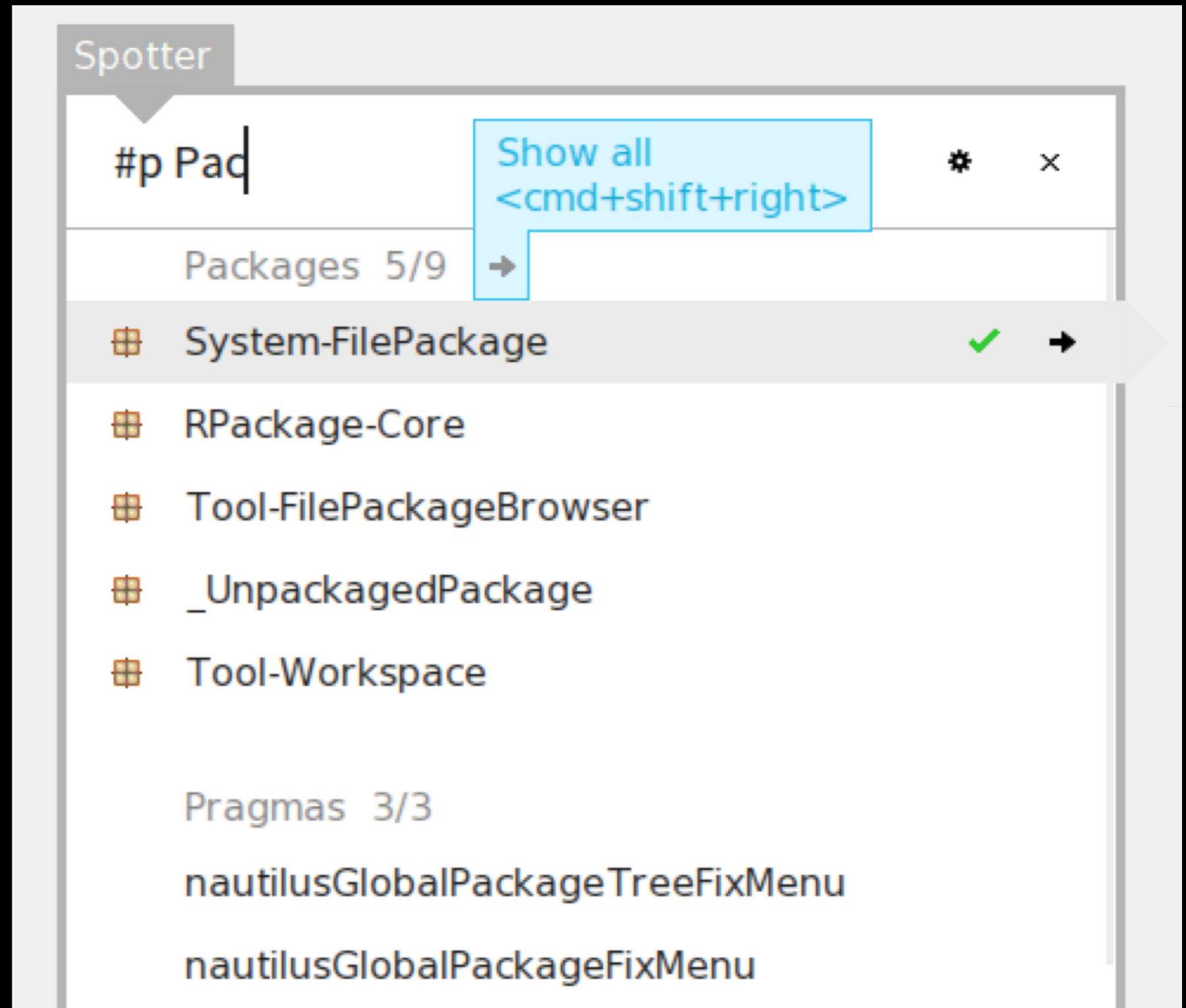


I...	E...	S...	A...	Ir...	De...	He...	Met...
37 <20> pushConstant: 3.0							
38 <D1> send: reciprocal							
39 <69> popIntoTemp: 1							
40 <10> pushTemp: 0							
41 <CE> send: x							
42 <70> self							
43 <CE> send: x							
44 <D2> send: asFloat							
45 <B9> send: /							
46 <6A> popIntoTemp: 2							
47 <10> pushTemp: 0							
48 <CF> send: y							
49 <70> self							
50 <CF> send: y							
51 <D2> send: asFloat							
52 <B9> send: /							
53 <6B> popIntoTemp: 3							
54 <12> pushTemp: 2							
55 <13> pushTemp: 3							
56 <B6> send: =							
57 <9B> jumpFalse: 62							
58 <12> pushTemp: 2							

# GTInspector is the killer inspector!



# Finding revisited



# Soon Faster Than VW :)

- Now Cog+Spur is in par with VisualWorks :)
- Soon with Sista even a lot “more faster”
- Tx Eliot and Clement (and RMoD) for all this!!

# A new GC: Spur

- New Object Layout
  - e.g. faster instantiation, larger hash
- Ephemeros, Fast Become:, Pinned Objects
- Immutable
- Double Performance

# Yet easy to adopt

- Moose (152 packages) switched in two afternoons (two people)
- Others: "I just loaded my packages"

Pharo 6.0 in one  
word!

A photograph of a white lighthouse with a dark lantern room and a red band near the top, situated on a dark, craggy rock formation. The lighthouse is surrounded by a thick, grey mist or fog that obscures the sky and the horizon. In the foreground, the dark silhouette of a shoreline with low-lying vegetation is visible.

Stabilisation

# Stabilisation



A photograph of a lighthouse at dusk or dawn. The lighthouse has a dark top section and a white middle section with horizontal stripes. Its beam is visible against a sky with orange and pink clouds. In the background, there's a body of water and distant lights from buildings.

Stabilisation

# Epicea

- Replace .changes
- High level model:
  - aggregate changes (refactoring)
  - serialized to disk independent of source model

**Epicea Log Browser**

Prior+Trigger view      Expand all

Event

more

Undo 24/1/2014 10:34  
ExampleClass >> #fortyTwo 24/1/2014 10:34

Undo 24/1/2014 11:06  
ExampleClass >> #fortyTwo 24/1/2014 11:06

#fortyTwo --> #forty2 24/1/2014 11:07  
ExampleClass >> #forty2 24/1/2014 11:07 This is a comment

ExampleClass >> #fortyThree 24/1/2014 11:07

ExampleClass >> #fortyTwo 24/1/2014 11:07

'I didn't like the name' 24/1/2014 11:08

" 24/1/2014 11:09

comment " trim' 24/1/2014 12:52

EpEntryItem >> #displayWidget 24/1/2014 12:53

MC save: Epicea-MartinDias.470 on: http://smalltalkhub.com/mc/MartinDias/Epicea/main/ 24/1/2014 12:55

Snapshot: /Users/tinchodias/Downloads/Epicea/Epicea-1.image 24/1/2014 12:55

'312312321' 24/1/2014 13:41

Content      Filters

"protocol: #example"	"protocol: #example"
fortyThree ^ self fortyTwo + 1	fortyThree ^ self forty2 + 1

# sampleInstance and example reconciled

CTGrid class >> grid22  
<sampleInstance>

```
I grid1 |  
grid1 := self new: 2.  
grid1 atRow: 1 atColumn: 1 put: 1.  
grid1 atRow: 1 atColumn: 2 put: 3.  
grid1 atRow: 2 atColumn: 1 put: 2.  
grid1 atRow: 2 atColumn: 2 put: 4.  
^ grid1
```

**Reuse**

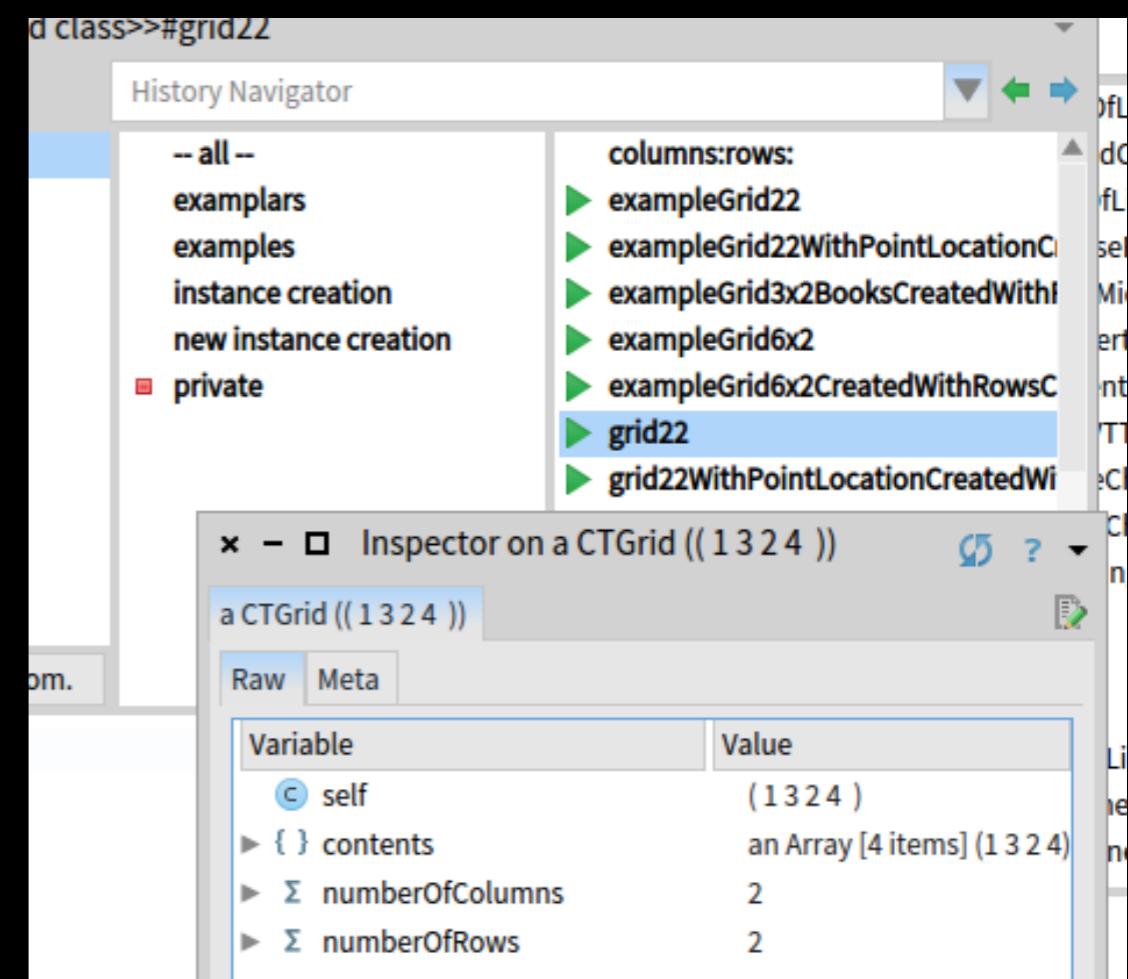
**Exploration**

CTGridTest >> grid22IsGreat

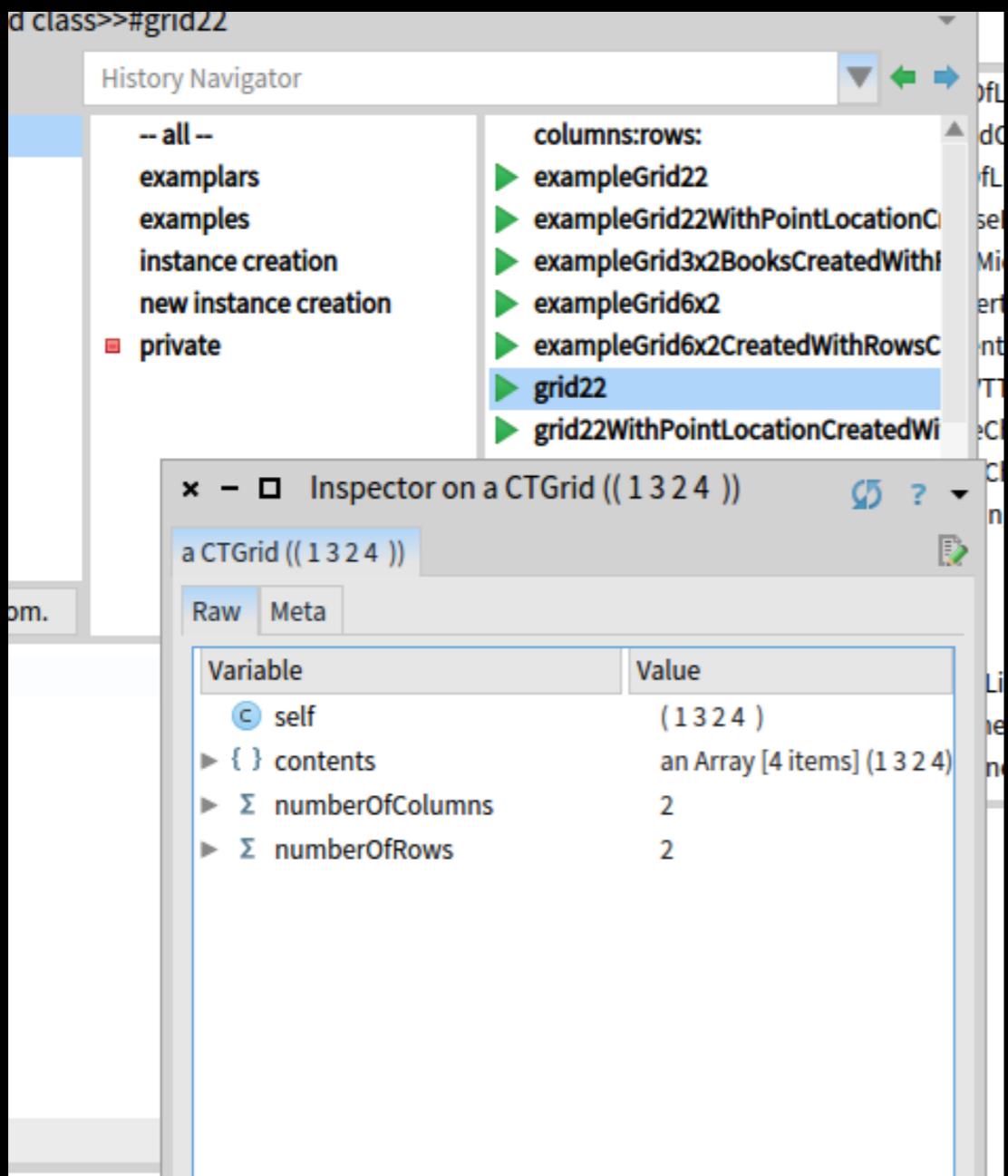
```
self assert: CTGrid grid22 isGreat
```

CTGrid class >> exampleFoo

Do whatever you want  
Display whatever you want



# sampleInstance and example reconciled

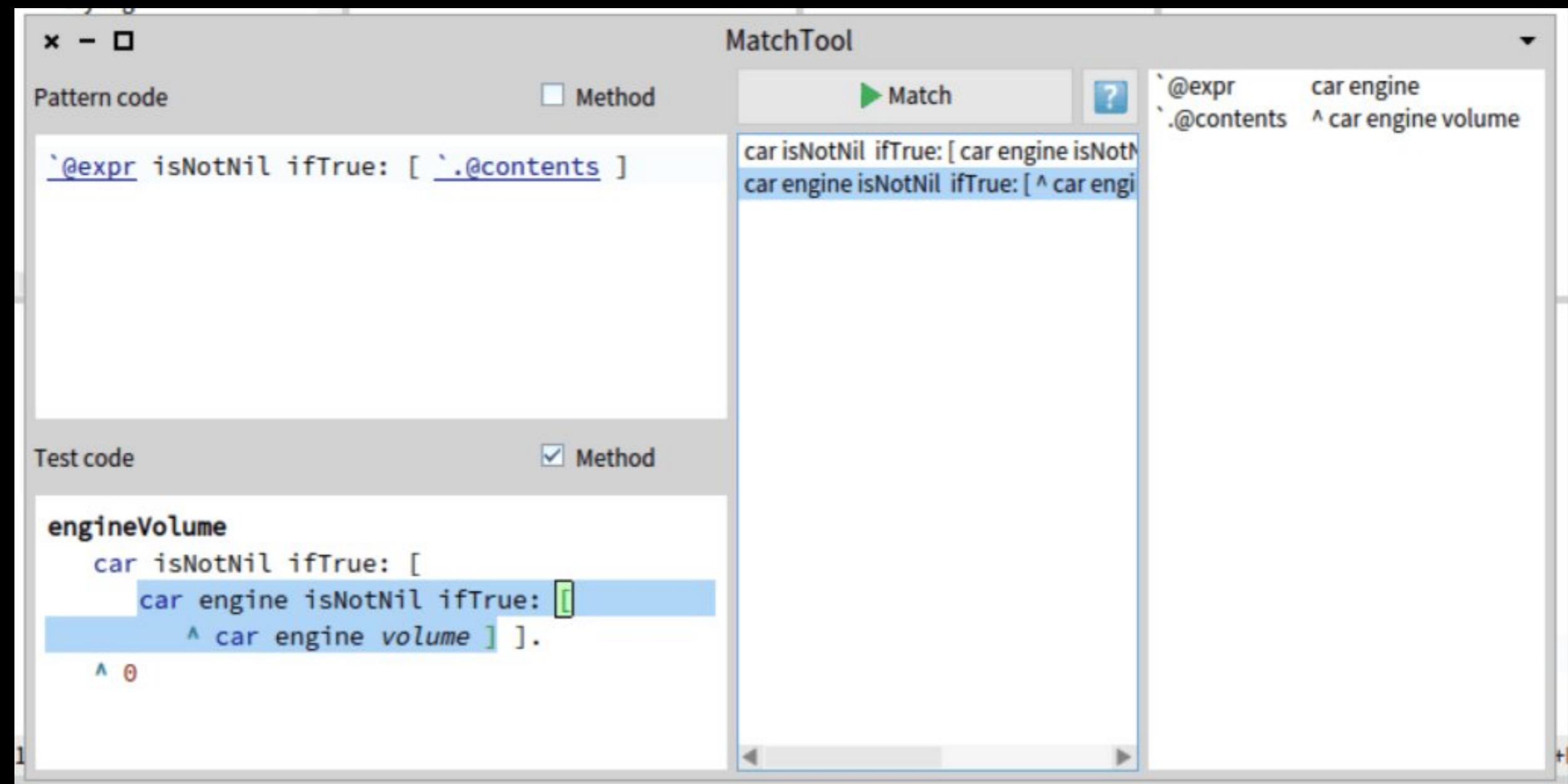


**Exploration**

**Documentation**

**Access**

# New Match tool



# New Quality Model

Renaku

More rules

Better rules

Tx Yuriiy

Ongoing Progress...

# 64 bits COG VM

- 64 bits in development
  - already working for linux and mac (it will be released in September for Pharo)
  - work in progress for windows
- Thanks Eliot and "all vm-dev team"

# Bootstrap

- Define Pharo in Pharo with Pharo (not C)
- Rebuild the kernel from this definition
- Reload all the rest

# Bootstrap in production

- Massive :)
- Massive improvements in quality (deadcode, hidden dependencies, modularity)
- Open the door to many improvements
- No more shrinking :)
- Tx Guille, Christophe and Pavel

# Modern Version Control

- Iceberg
  - Git but not only
  - Pull Request

# Cargo

- Package management system
- Meta data at the package level
- Support for package distribution (npm, ...)

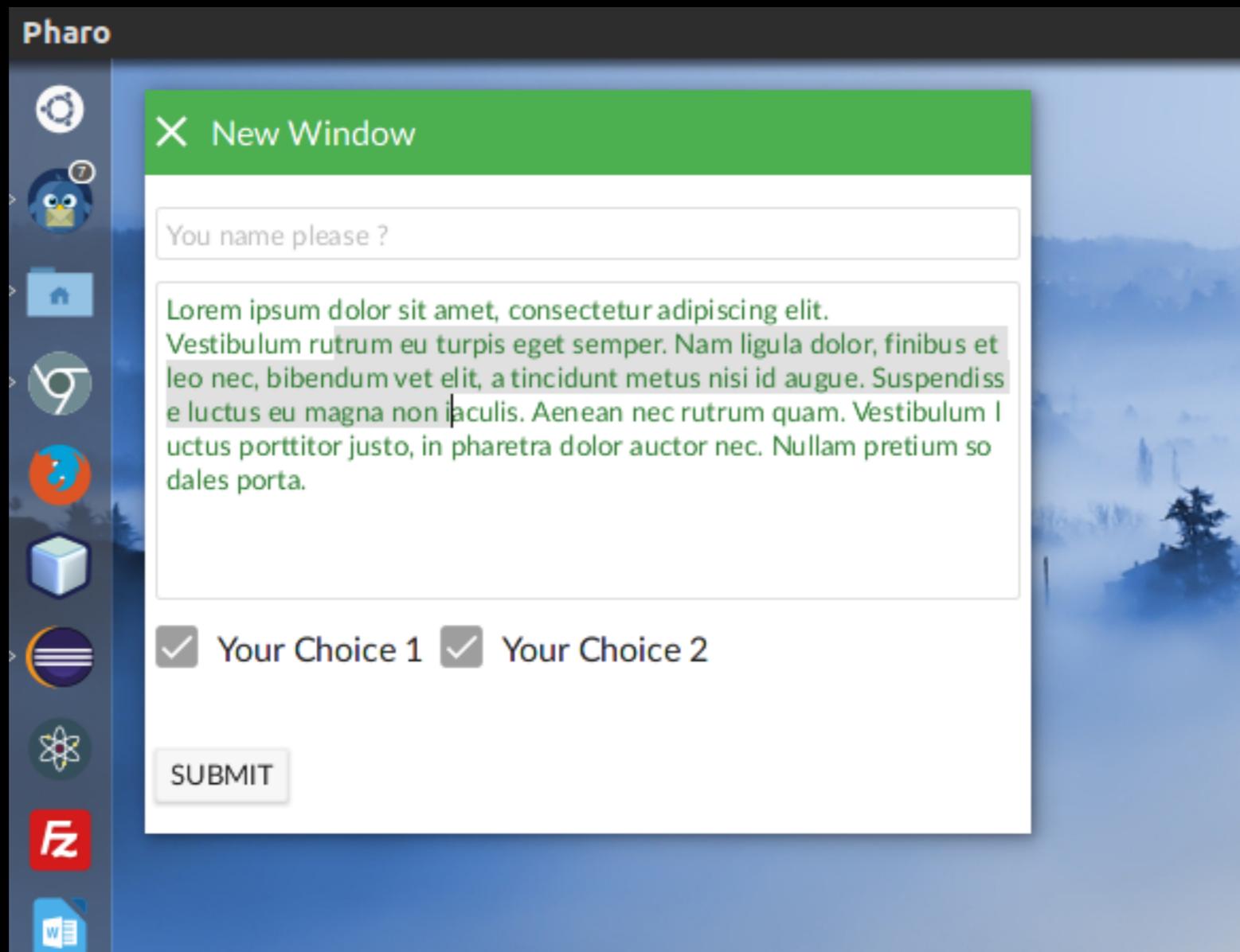
# The Future is Bright

- Sista
- Bloc
- Brick
- ThreadedFFI

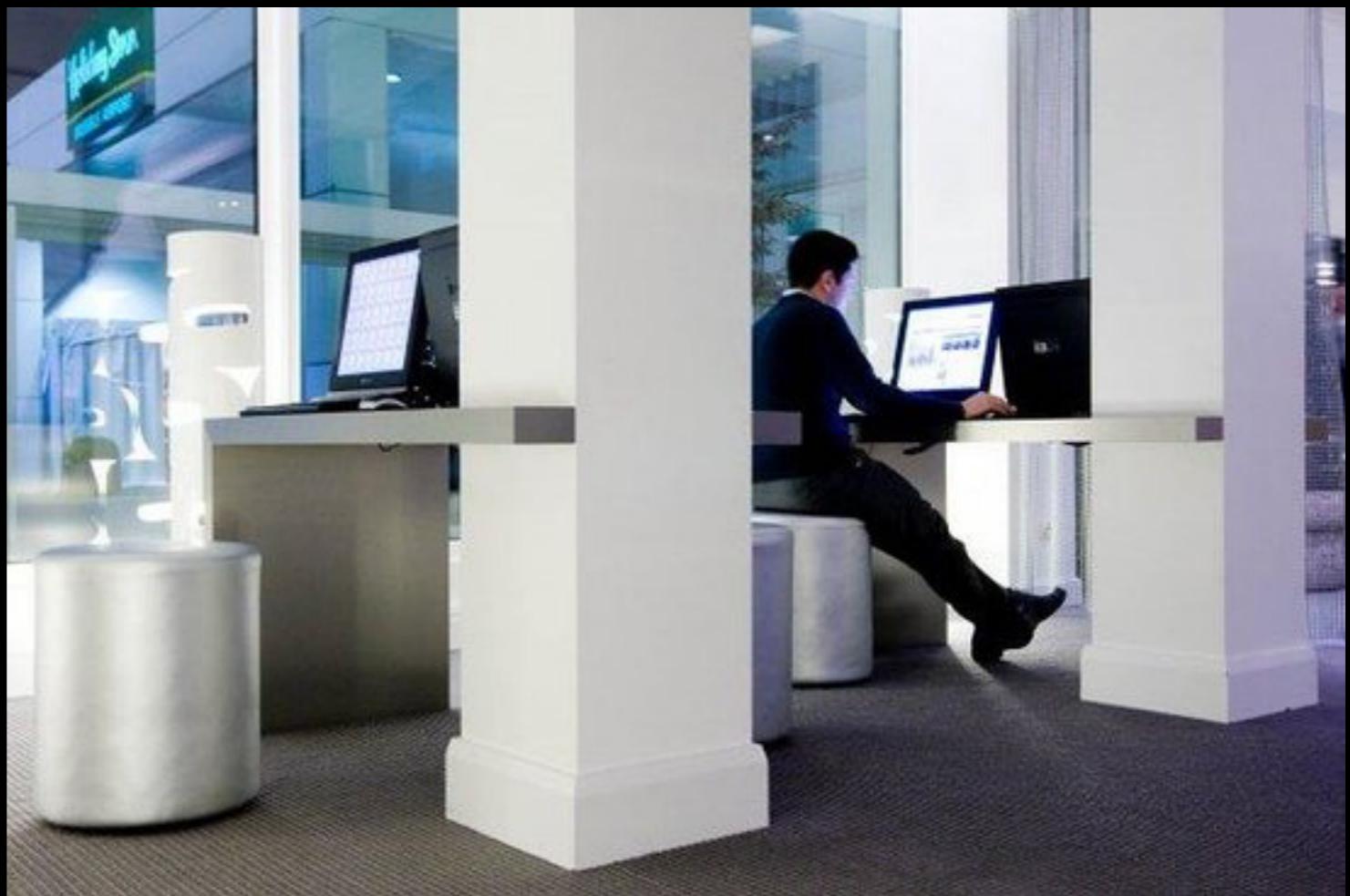
# Sista: Runtime Optimizer is stabilizing :)

- Current JIT work per method
- Sista: detect hotspots, collect type info ==> Optimize
- Support 4th level optimisation of modern VMs (V8, Java)
- Bytecode-2-Bytecode
- Optimizer implemented in Pharo Image

# Block[2] := Bloc anotherSpin



# The Business corner





Nos enfocamos en lo que importa del negocio  
sin perder de vista los detalles de su implementación.



Centramos nuestras soluciones en la experiencia móvil.

Aplicaciones nativas para el sistema operativo que cuenta con más de 900 millones de dispositivos activados.

Soluciones que escalan de manera robusta y eficiente de acuerdo a la demanda de uso.

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Pharo platform as a Service: put your Smalltalk web-application online at Pharocloud in just 3 clicks

Try it for FREE Watch how it works

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Wind Energy Pioneering new ways of maximising sustainable wind energy yields. Our products and services optimise asset availability, wind turbine performance and drivetrain reliability. We work with owners, operators, manufacturers, insurers and service providers worldwide.

Get in touch We provide services and software to a range of industries ENQUIRE TODAY >

Home > Industries > Wind Energy

Related links InSight WindVND Butterfly platform Forensic engineering Analysis service Monitoring service

Overview Why we are specialists Who we work with

Wind Energy Pioneering new ways of maximising sustainable wind energy yields

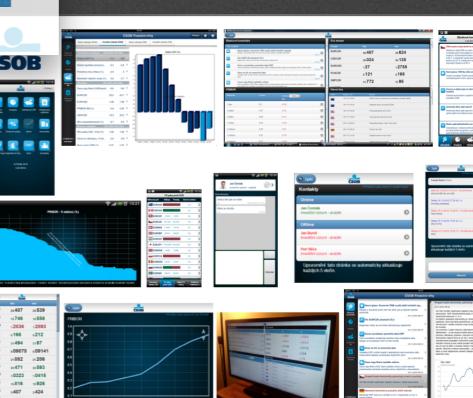
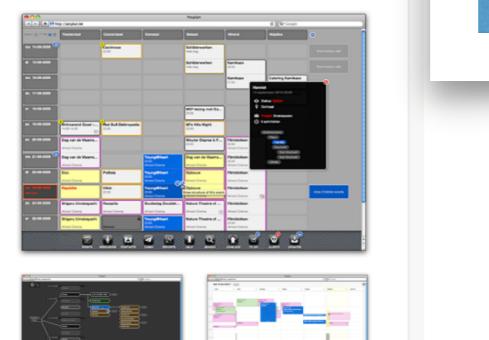
## WEBDRUCK.CH Web-To-Print Solution

- Design and create individual printed matter
- eShop with credit card payment
- High quality PDF output with Printing Process integration
- Thousands of orders for seven Swiss printing companies

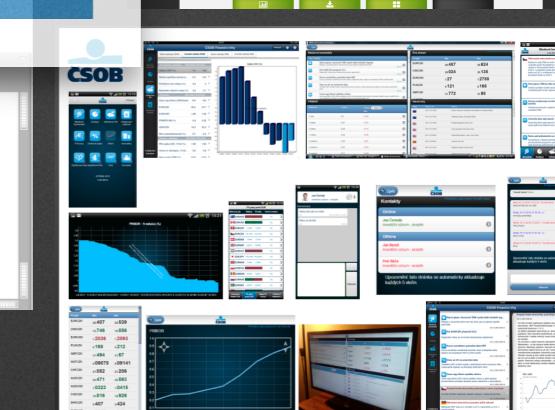
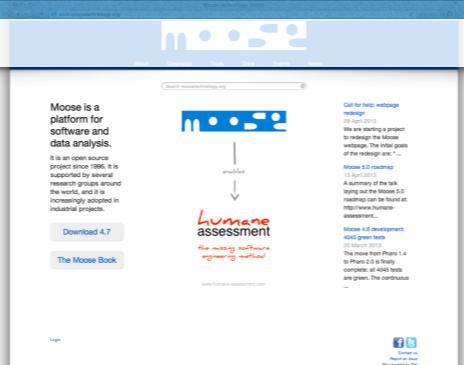
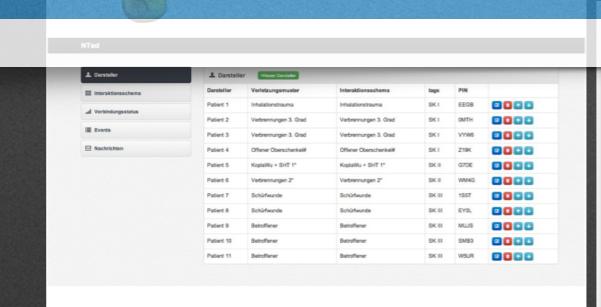


### Yesplan is veelzijdige software voor het efficiënt plannen van evenementen.

Yesplan is uiterst gebruiksvriendelijk, flexibel en makkelijk te koppelen met andere software.



# Some Success Stories



airflowing the essential source to flow

Organize your creative work

Sales, tasks and finances: your team and all that's essential in one place

Plans and Pricing 14-day free trial for all plans sign up in 60 seconds

Manage your simple way Questions? Click here to chat with us!

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Drag & Drop Handlich: Boxen und Elemente frei auf der Seite positionieren, mail@cmsbox.com

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Eigene Bilder und Videos direkt auf die Webseite laden

Suchen... CMSBOX GMBH - TERRASSENWEG 18 - CH-3012 BERN - +41 (0)31 356 822

Continuous API Testing  
keep your services under control 24/7

t3

# Pharo is ATM Like Device in Moscow

**Вклады**  
выгодно    быстро    удобно

Вклады застрахованы

МТС

Яндекс-деньги

коммунальные платежи  
Москва

ЖКУ-Москва

Ростелеком

Сотовая связь

ЖКХ услуги

Оплата кредитов

Интернет Телефония

Электронная коммерция

Денежные переводы

Телевидение

РАЗВЛЕЧЕНИЯ и досуг  
игры - соцсети - знакомства

Другие услуги

О банке | копия ЧЕКА | Статус платежа

ПОИСК  
найди своего провайдера

MobileTerminated ForwardSM

```

plan: SCCPGlobalTitle npISDN;
addr: destGT;
translation: 0;
yourself);

forwardSM := ASN1Dictionary new
at: 'sm-RP-DA' put: (ASN1Dictionary new
at: 'imsi' put: destIMSI toTBCD;
yourself);
at: 'sm-RP-OA' put: (ASN1Dictionary new
at: 'serviceCentreAddressOA' put: sourceSMSC toE164;
yourself);
at: 'sm-RP-UI' put: (ByteArray readHexFrom: '240c9194814813654200005110712195534010c8329hfd0699e5ef3'
yourself.
operationName := 'forwardSM'.

dialogue := ZHLR endPoint newDialogue.

invoke := dialogue
requestTcInvokeNamed: operationName parameters: for
class: 1 timeout: 500.
invoke
onReturn: [];
onError: [];
onReject: [];
onReturnLast: [:result | ].

dialogue
requestTcBeginDestinationAddress: imsiAddr
originatingAddress: mscAddr
applicationContextName: '0.4.0.0.1.0.25.2' asAsn1Oid .

```

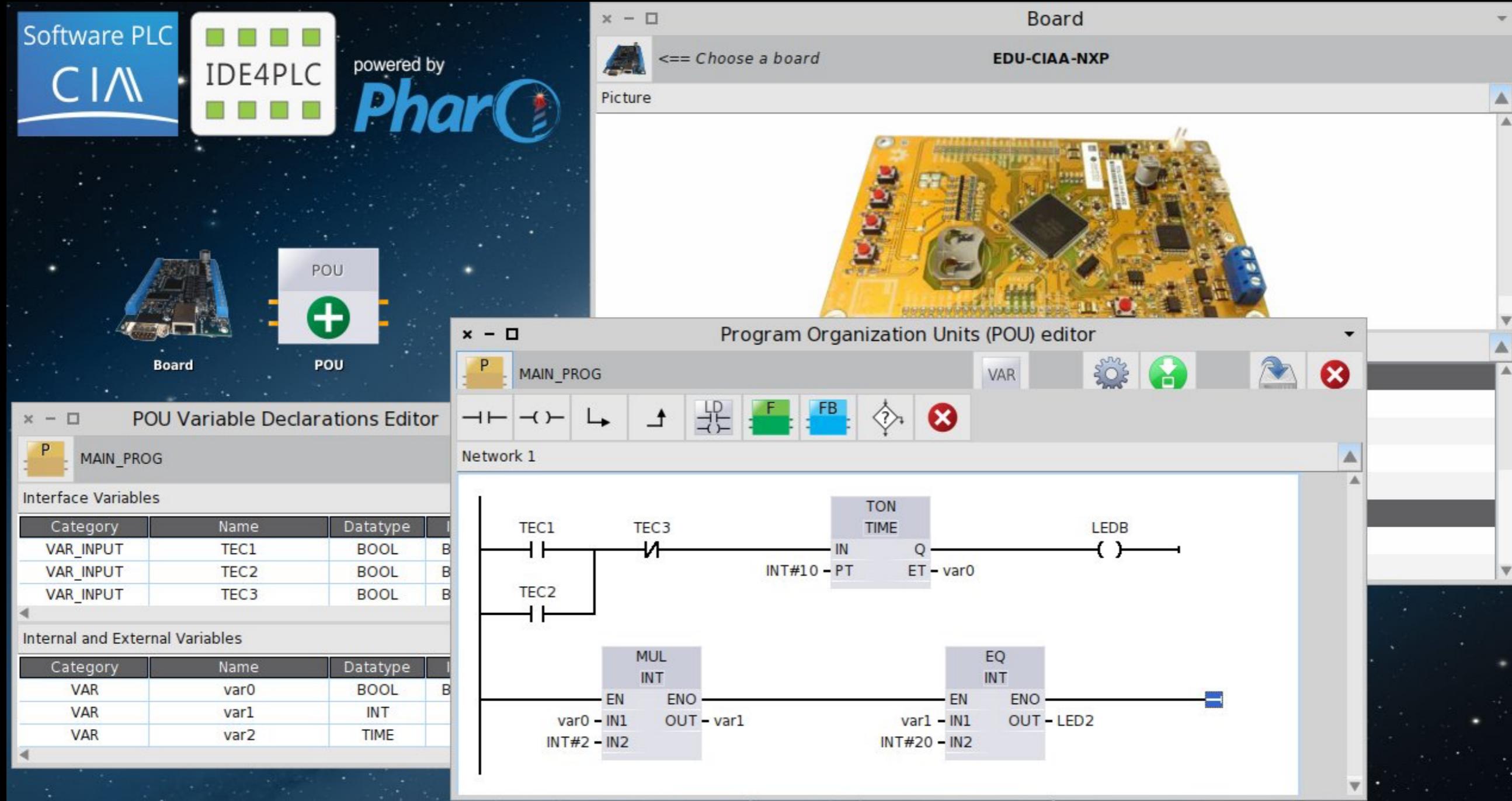
Do it    Print it    Inspect it    Explore it    Debug it    Profile it  
 Find...    Find again    Extended search...  
 Do again    Undo

No.	Time	Source	Destination	Protocol	Length	Info
1	8.000000	6	2008	GSM S...	236	invoke forwardSM

Frame 1: 236 bytes on wire (1888 bits), 236 bytes captured (1888 bits)  
Linux cooked capture  
Internet Protocol Version 4, Src: 208.208.208.208, Ost: 208.208.208.208  
Stream Control Transmission Protocol, Src Port: 2985 (2985), Ost Port: 2985 (2985)  
MTP 3 User Adaptation Layer  
Signalling Connection Control Part  
Transaction Capabilities Application Part  
GSM Mobile Application  
GSM SMS TPDU (GSM 03.48) SMS-DELIVER  
0.... .... = TP-RP: TP Reply Path parameter is not set in this SMS SUBMIT/DELIVER  
0... .... = TP-UDHI: The TP UD field contains only the short message  
..1. .... = TP-SRI: A status report shall be returned to the SNSF  
.... 0... = TP-LP: The message has not been forwarded and is not a spawned message  
.... .1.. = TP-MHS: No more messages are waiting for the MS in this SC  
.... ..00 = TP-MTI: SMS-DELIVER (0)  
> TP-Originating-Address - (491884315624)  
> TP-PID: 8  
> TP-DCS: 8  
> TP-Service-Centre-Time-Stamp  
TP-User-Data-Length: [16] depends on Data-Coding-Scheme  
TP-User-Data  
SMS text: Hello from Pharo

0000	62	69	48	04	01	00	00	89	6b	1e	20	1c	06	07	00	11	bf	....	k.(....
0008	85	85	81	01	01	a8	11	60	0f	88	82	87	80	a1	00	86	.....	.....	.....
0008	07	84	88	00	01	00	19	02	6c	41	a1	3f	02	01	01	02	.....	.....	IA.?
0008	01	2e	30	37	80	00	02	43	68	18	91	50	19	84	08	..07..b.	Ch...	...	
0008	91	94	51	97	10	00	00	88	04	21	24	8c	91	94	81	48	..0.....	..!S.....!!	
0008	13	85	42	88	00	51	18	71	21	95	53	48	10	c8	32	9b	..eB..U.q	1.58.-2,	
0008	fd	86	99	e5	ef	36	80	8a	8e	cb	df	88	.....	.....	.....	.....	.....	.....	....

# Sysmocom: Free Software for Mobile Communication



# Programmable Logic Controllers

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Our Clients

The image displays a collage of screenshots from the CableExpertise software interface, illustrating its comprehensive monitoring and management capabilities:

- Dashboard:** Shows a map of a network area with a red marker, a red circular progress bar indicating "Utilisation Downlink" at 95% (Capacity: 500 Mbps), and a line graph titled "Traffic CMDS vers uplink" showing fluctuating traffic levels over time.
- Operations:** A section with four cards: "CMTS" (red, with an exclamation mark and "CMTS\_STRING\_défaillante"), "Switch" (green, "Tout est en ordre avec SWITCH"), "Modems connectés" (green, "99% 1545/1550"), and "Routeur" (green, "Tout est en ordre avec ROUTEUR").
- Network IP:** A tree view of network components under "CMTS".
- Temperature Monitoring:** A table showing temperatures for various CMTS components (NPE Inlet, NPE Outlet, NPF Inlet, NPF Outlet, MPP Inlet, MPP Outlet, CPU Inlet) across multiple slots.
- Mobile App:** A Samsung smartphone displaying the CableExpertise mobile application interface.
- Supervision HFC:** A list of HFC supervision tasks including "Supervision Talange", "Supervision Creutzwald", "Supervision Rombas", and "Supervision SVOM".
- Supervision Talange:** A green card stating "Tout est en ordre avec Supervision Talange".
- CMDS Details:** A table showing CMDS details like Alias, ID, Type, Condition, and Status.
- CMDS Performance:** A table showing CMDS performance metrics such as Traffic Min. VO (Mbps), Peak VO (Mbps), Min. Reception VO (Mbps), Max VO (Mbps), Peak VO (Mbps), and Min. Reception VO (Mbps).
- CMDS Facade:** A diagram showing the front panel of a CMDS unit with various ports and indicators.

# CableExpertise

MULTICITY-PARTNER-PROGRAMM ADMIN

mc-partner.2denker.de

McDonald's ▾

Neues Location Bases Advertisement

Push

Ticketing

**Location**

**PUSH TEXT**

**Push Text**

Thanks for your rental. Here is a voucher from  
McCafe.

Dieser Text wird auf dem Home-Screen als Vorschautext angezeigt

**Anzeigentext**

Dieser Text wird in der Detailansicht angezeigt

**Link zur Webseite**

<http://www.2denker.de/voucher>

Dieser Weblink wird unter der Anzeige angezeigt.

**Longitude**

13.4

**Latitude**

52.52

Cancel Save

Neue Anzeige

STANDORT

17:19  
38 % geladen

Multicity jetzt

Thanks for your rental.  
Here is a voucher from McCafe

# MultiCity

# SORABITO

「世界中の明日をつくる」それがSORABITO株式会社の想いだ。SORABITOは、働く機械の国際オンライン取引所『ALLSTOCKER』を運営する。



『ALLSTOCKER』は、建設機械や農業機械を中心とした産業機械の取引ができる業界唯一の中古産業機器のグローバルマーケットプレイス。メガバンク等との連携により実現した独自の決済機能、売り手の保管場所からDoor-to-Doorで世界中に機械を運送する物流機能、全国統一鑑定基準に基づき出張鑑定をする鑑定機能を一括で提供することで、これまで年に数回の限られた機会でしか売買取引ができなかった上、タイミングのマッチングが起こりづらかった産業機械流通の効率化を実現する。

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**PharC** Pro

# Pharo Pro

- Managed by the Pharo Consortium
- Professional Support

# Pharo Pro Services

- Long Term Support (LTS)
- Supporting different platforms
- Supporting migration
- Specific development (libraries, bindings)

# Pharo Pro

- Talk to us :)
- Esteban and me are here to talk to you

# External projects

- ✿ Far too many to list them :)

# Better Database support

- Garage provides a unified API
- Glorp up to date.

# More support for NoSQL

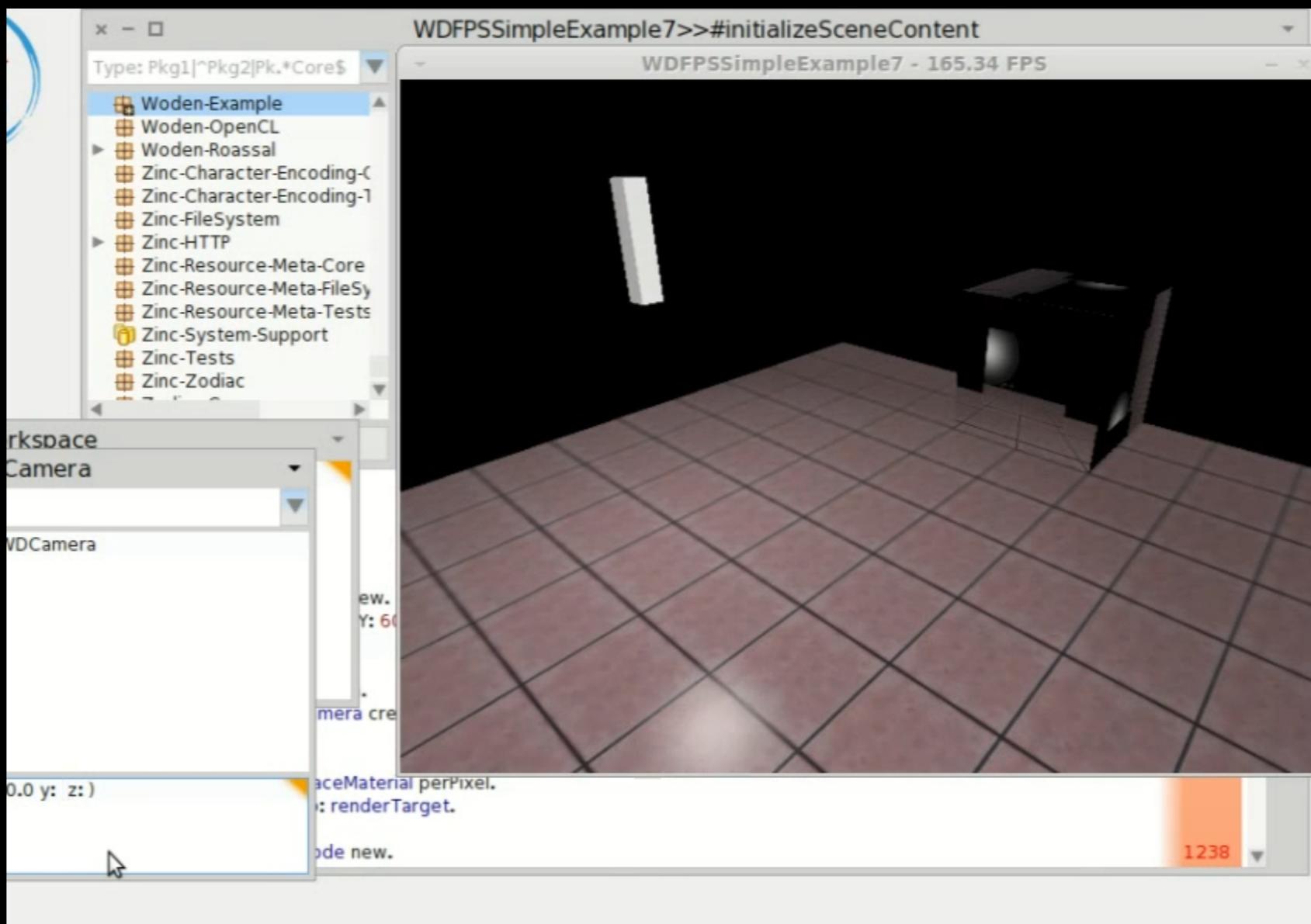
- Towards Voyage 2
  - PunQLite
  - Bug fixes

# Pillar

- Epub, HTML, LaTeX, Markdown
- Books, slides, tutorials
- Tx Cyril, Yann, Thibault, Damien

# Woden 3D ++

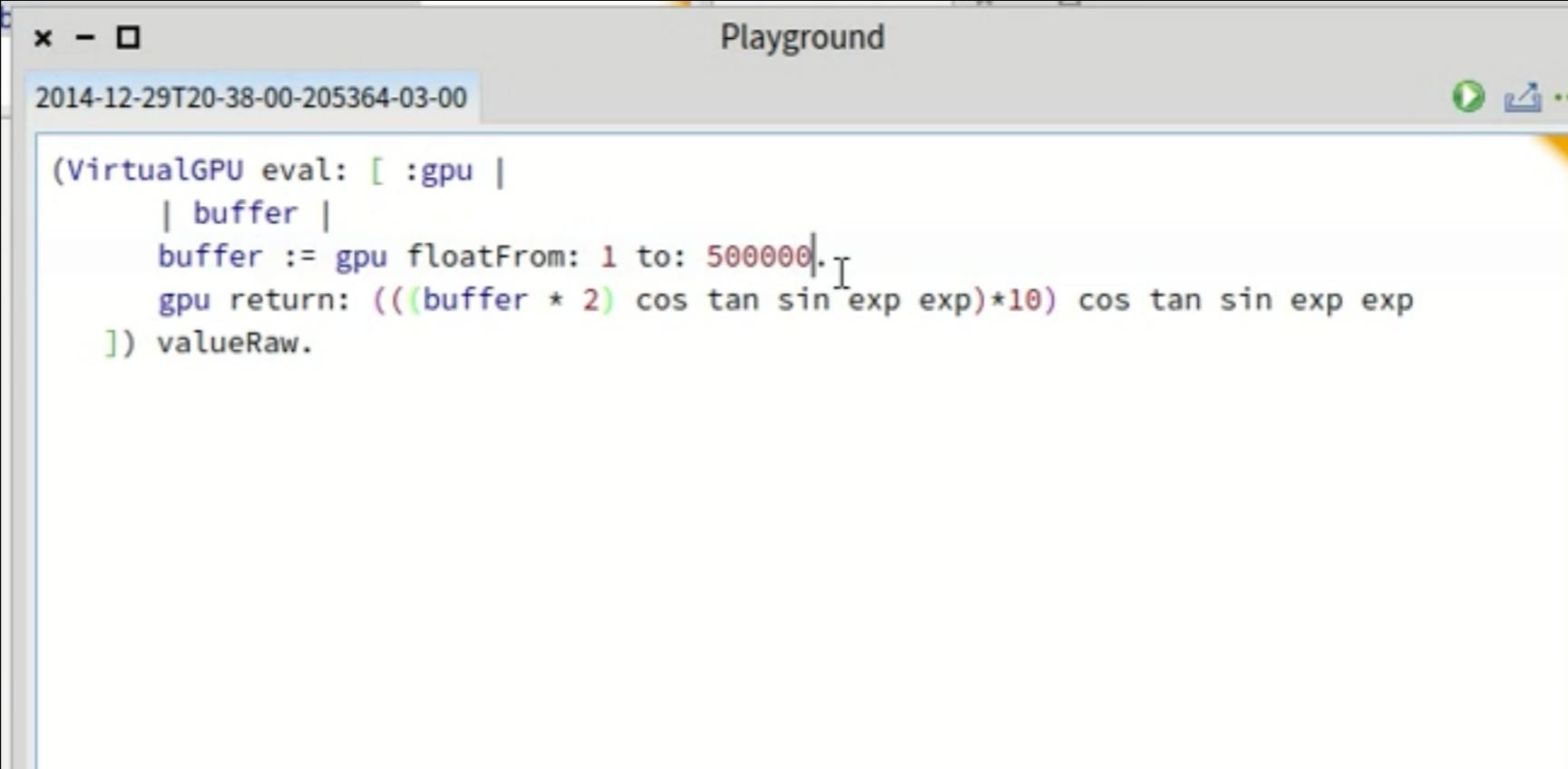
Vulkan  
Metal  
Direct3D



<https://www.youtube.com/watch?v=1Nze9tnwYxY>

# Virtual GPU

- The VirtualGPU is a simple DSL/framework for parallel algorithms.



The screenshot shows a Java IDE window titled "Playground". The code editor displays a file named "2014-12-29T20-38-00-205364-03-00.java". The code is a snippet of the VirtualGPU framework:

```
(VirtualGPU eval: [ :gpu |  
    | buffer |  
    buffer := gpu floatFrom: 1 to: 500000.  
    gpu return: (((buffer * 2) cos tan sin exp exp)*10) cos tan sin exp exp  
]) valueRaw.
```

<https://www.youtube.com/watch?v=6xrq4OkvSi4>



inspired!



feenk



http://  
pharo.org

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