

A master class: “Live objects for complex projects with Pharo”

<http://stephane.ducasse.free.fr>

<http://www.pharo.org>





Yesplan
Let's make it happen



feenk

inspired!

BetaNine
software engineering

 **Sensus**
Systems that make sense

 **MINES**
Douai
IA
Informatique
et Automatique

Pleiad project 

THALES ZWEIDENKER



projector
software



telna

HRworks

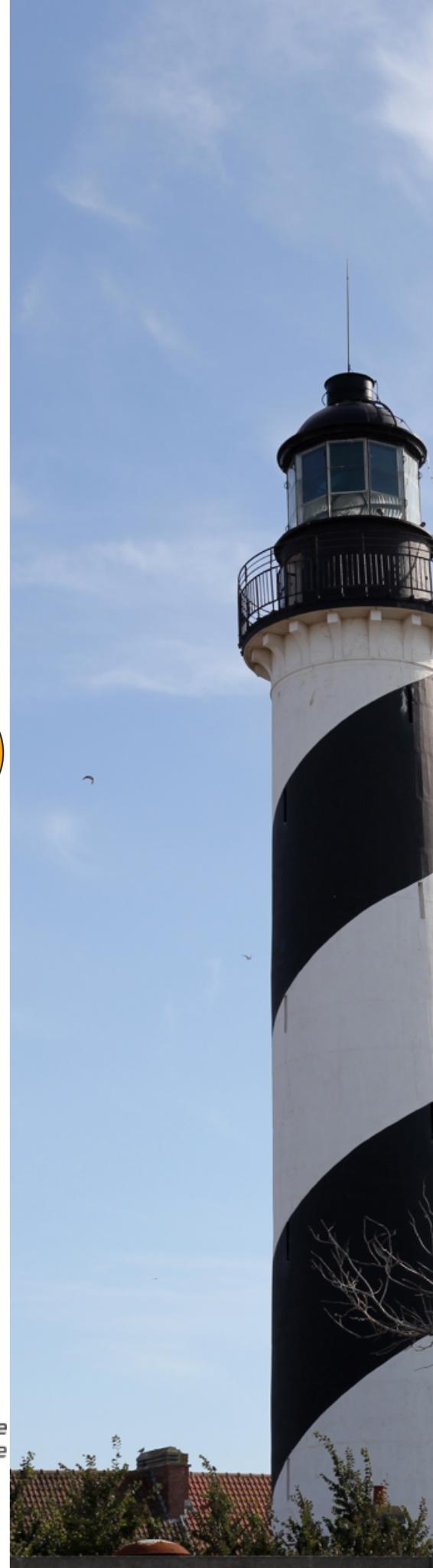
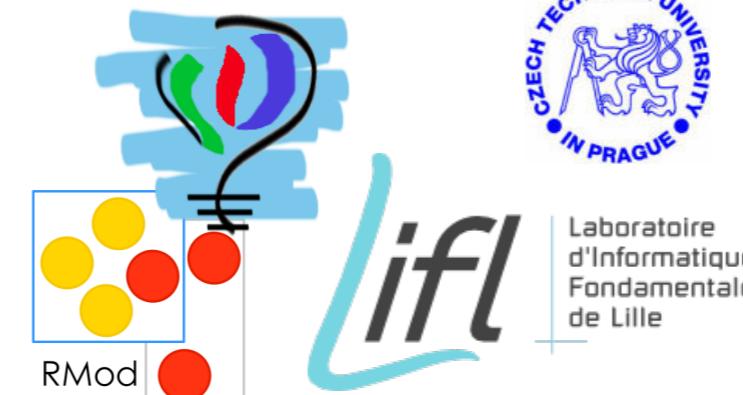




TA MÈRE
SCRL
BADASS MOBILE DEVELOPMENT


FAST
Fundación Argentina de Smalltalk


u^b
UNIVERSITÄT
BERN



Pharo!

- System: Pure object language + full IDE
- Powerful, elegant and fun to program
- Great community
- Living system under your fingers
- Works on Mac OSX, Linux(es), iOS, Windows, Pi, and “android”
- 100% MIT

Elegant!

- Full syntax on a postcard
- Simple and powerful objet model

Leuchttürme

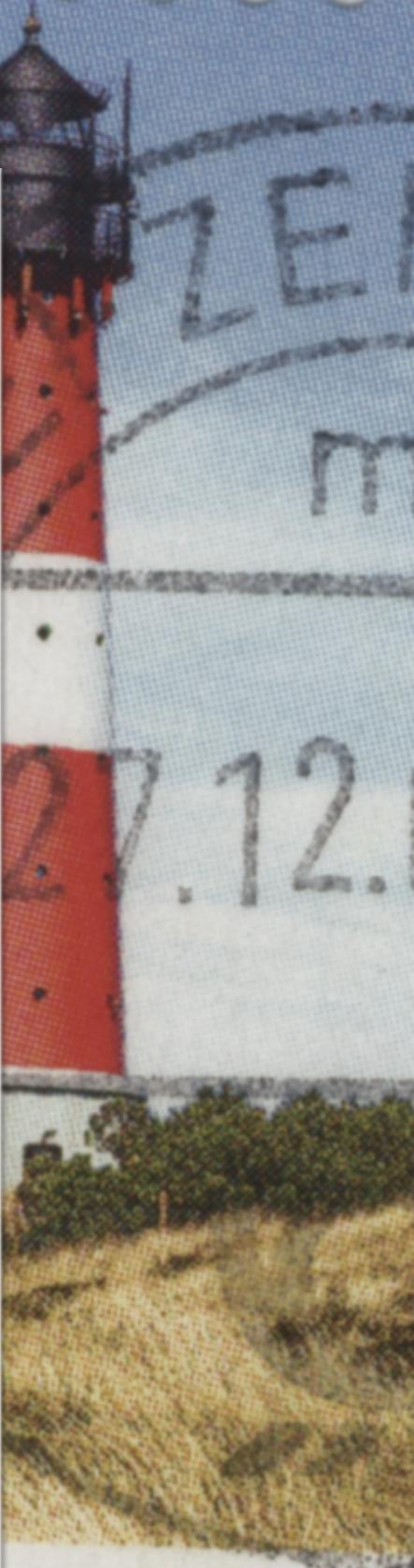


```
method name           parameter
exampleWithNumber: x

<syntaxOn: #postcard> pragma
"A ""complete"" Pharo syntax"
| y | local variable
boolean literals      binary message   unary message
true & false not & (nil isNil) nil literal
ifFalse: [ self perform: #add: with: x ]. block
assignment           keyword message
y := thisContext stack size + super size.
instance variable     integer literals
byteArray := #[2 2r100 8r20 16rFF]. byte array
array generated at runtime
{ -42 . #($a #a #'I'm' 'a' 1.0 1.23e2 3.14s2 1) }
do: [ :each | symbols
local block variable   character
| var | global variable
var := Transcript
show: each class name; cascade
show: each printString ].
keyword message
^ x < y return instruction
```

<https://www.pharo.org>

PLACE
STAMP
HERE

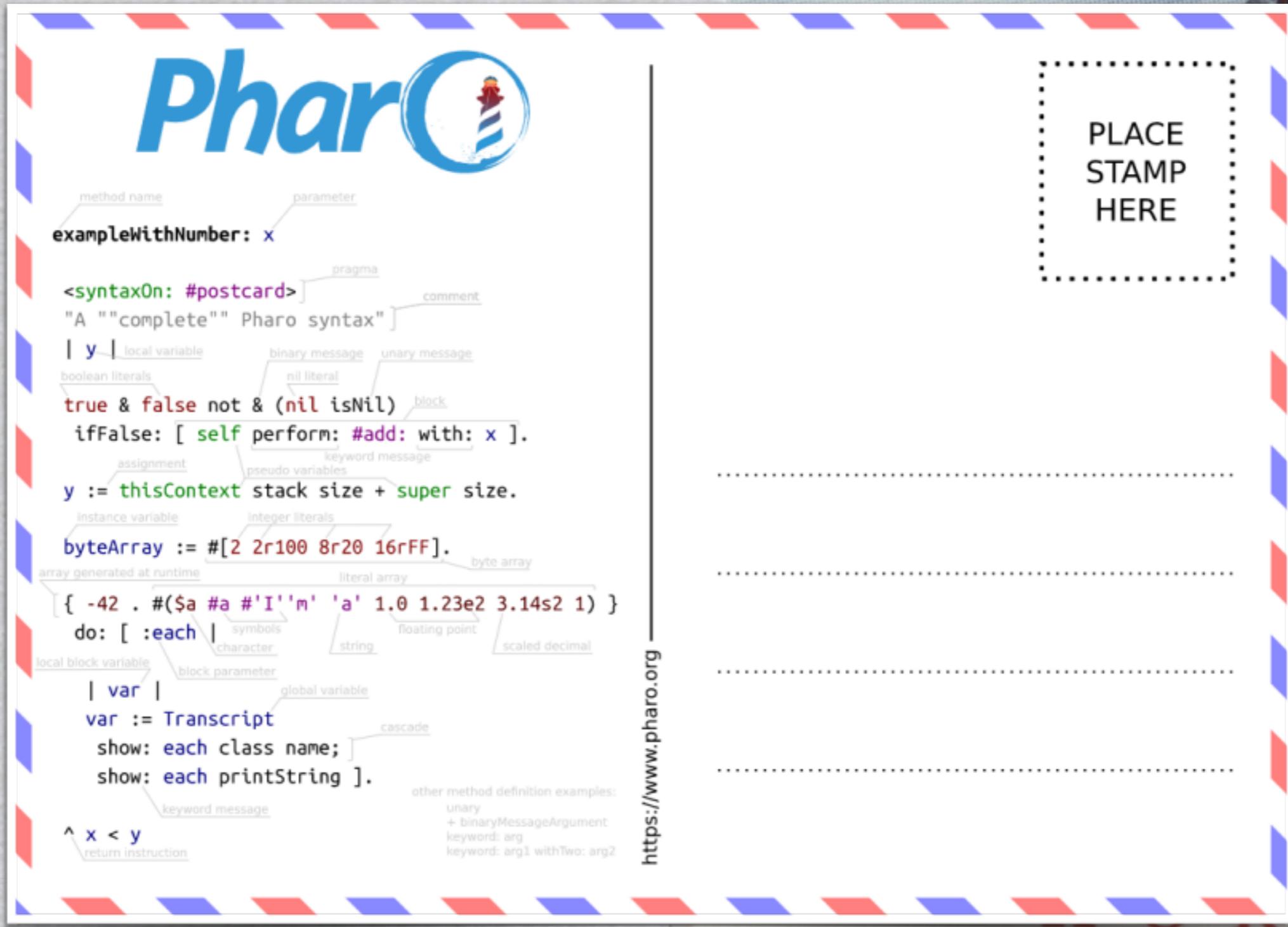


N U M

Yes the full Syntax!

Yes there is nothing else...

Leuchttürme



N U M

```
exampleWithNumber: x

<syntaxOn: #postcard>
"A ""complete"" Pharo syntax"
| y | local variable
true & false not & (nil isNil)
ifFalse: [ self perform: #add: with: x ].

y := thisContext stack size + super size.

byteArray := #[2 2r100 8r20 16rFF].
{ -42 . #($a #a #'I''m' 'a' 1.0 1.23e2 3.14s2 1) }
do: [ :each |
| var | global variable
var := Transcript
show: each class name;
show: each printString ].^ x < y
```

method annotation

```
exampleWithNumber: x parameter
<syntaxOn: #postcard>
"A ""complete"" Pharo syntax" comment
| y | local variable
true & false not & (nil isNil)
ifFalse: [ self perform: #add: with: x ].

y := thisContext stack size + super size.

byteArray := #[2 2r100 8r20 16rFF].
{ -42 . #($a #a #'I''m' 'a' 1.0 1.23e2 3.14s2 1) }
do: [ :each |
| var | global variable
var := Transcript
show: each class name;
show: each printString ].
```

return

exampleWithNumber: x parameter

local var

```
<syntaxOn: #postcard>
"A ""complete"" Pharo syntax"
| y | local variable
true & false not & (nil isNil)
ifFalse: [ self perform: #add: with: x ].
```

affectation

```
y := thisContext stack size + super size.
```

instance var

```
byteArray := #[2 2r100 8r20 16rFF].
```

local var

```
{ -42 . #($a #a #'I''m' 'a' 1.0 1.23e2 3.14s2 1) }
do: [ :each |
| var | global variable
var := Transcript
show: each class name;
show: each printString ].

^ x < y
```

```
exampleWithNumber: x

<syntaxOn: #postcard>
"A ""complete"" Pharo syntax"
| y | local variable
true & false not & (nil isNil)
ifFalse: [ self perform: #add: with: x ].  

closure
y := thisContext stack size + super size.

byteArray := #[2 2r100 8r20 16rFF].  

byt array

{ -42 . #($a #a #'I''m' 'a' 1.0 1.23e2 3.14s2 1) }
do: [ :each |  

arg closure
| var | global variable
var := Transcript
show: each class name;
show: each printString ].  

byt array

^ x < y
return instruction
```

```
exampleWithNumber: x

<syntaxOn: #postcard>
"A ""complete"" Pharo syntax"
| y | binary msg
true & false not & (nil isNil)
ifFalse: [ self perform: #add: with: x ].  
keyword msg
y := thisContext stack size + super size.  
unary msg
byteArray := #[2 2r100 8r20 16rFF].  

{ -42 . #($a #a #'I''m' 'a' 1.0 1.23e2 3.14s2 1) }
do: [ :each |  

| var |  

var := Transcript  

show: each class name;  

show: each printString ].  
cascade separator  
binary msg
^ x < y
```

exampleWithNumber: x

```
<syntaxOn: #postcard>
"A ""complete"" Pharo syntax"
| y |
```

true & false not & (nil isNil)

ifFalse: [self perform: #add: with: x].

y := thisContext stack size + super size.

byteArray := #[2 2r100 8r20 16rFF].

array character
{ -42 . #(\$a #a #'I''m' 'a' 1.0 1.23e2 3.14s2 1) }

do: [:each | **symbol**
string

| var |

var := Transcript

show: each class name;

show: each printString].

number

^ x < y

M

A Pure World of Objects

Only objects +
messages + closures!

mouse, booleans, arrays, numbers, strings, windows, scrollbars, canvas, files, trees, compilers, sound, url, socket, fonts, text, collections, stack, shortcut, streams, ...

A Full Uniform Model

- Dynamically typed
- Everything is an object instance of a class
- All methods are public virtual
- All attributes are (C++) protected
- Single inheritance with traits

Less is more!

No constructors, no static methods, no operators

No type declaration, no primitive types,

No interfaces, no need for factory

No packages/private/protected modifiers

No parametrized types

No boxing/unboxing

Still powerful



"Now! ... That should clear up
a few things around here!"

A black and white photograph of a person's hand holding a red pencil, writing on a yellow surface. The hand is shown from the side, with the pencil angled downwards. The yellow surface has some red ink or paint on it, suggesting a drawing or sketch. The background is plain white.

Fully Written in Itself

- Everything is written in Pharo
- One simple syntax/model to access everything

Pharo is highly immersive

Immersing...

- * Pharo is not a blackbox
- * Pharo is **fully inspectable** and
reflective
- * but there is more

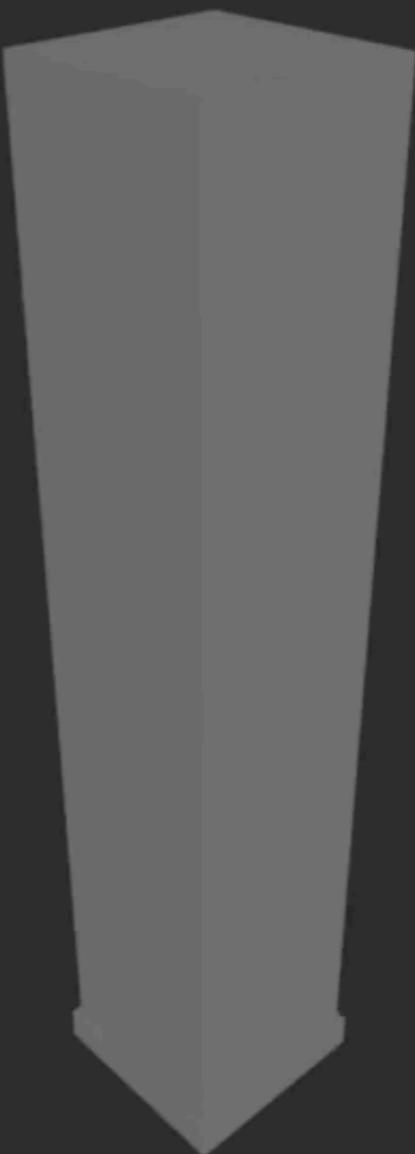
A photograph of a scuba diver in full gear, including a tank labeled "CANADA", interacting with a group of stingrays on a sandy ocean floor. The diver is positioned centrally, facing towards the right. In the background, a large school of small fish swims through the water. The overall scene is set in a deep blue underwater environment.

Immersed and interacting
with live objects

Workspace

```
| elements lay |  
  
elements := (1 to: 5) collect: [ :ob |  
  (R3CubeShape new) elementOn: ob ].  
    
lay := R3WallLayout new.  
lay on: elements.  
  
UberPresenter present: elements
```

Uber Presenter



We can do the same with
web app, sockets, networks,
sensors, living programing....

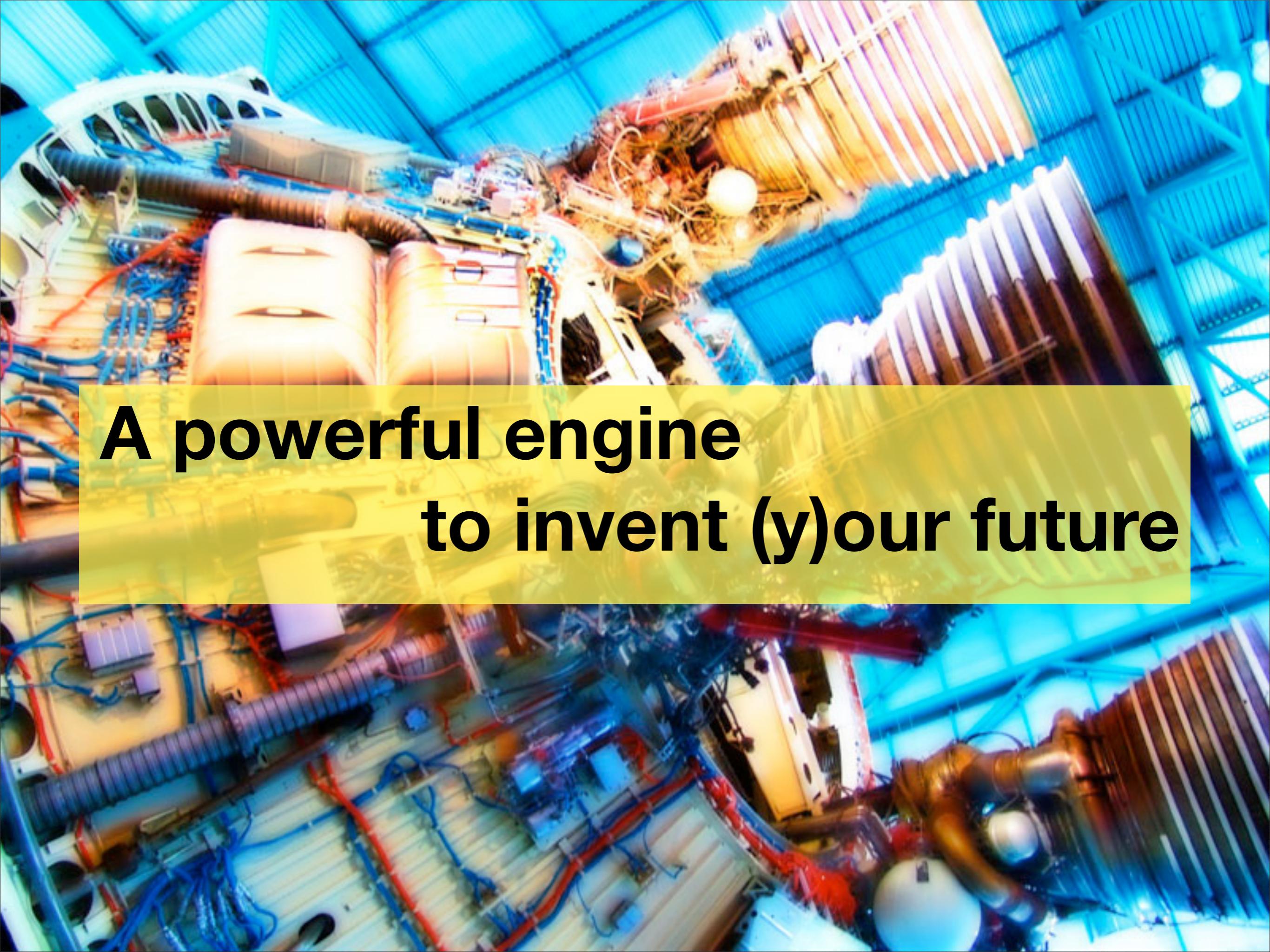
Hackers scripting live the coffee machine



Hackers @ work



Our goal...



A powerful engine
to invent (y)our future

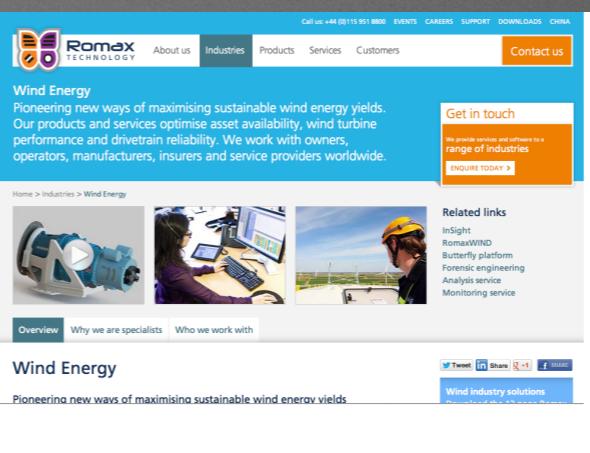
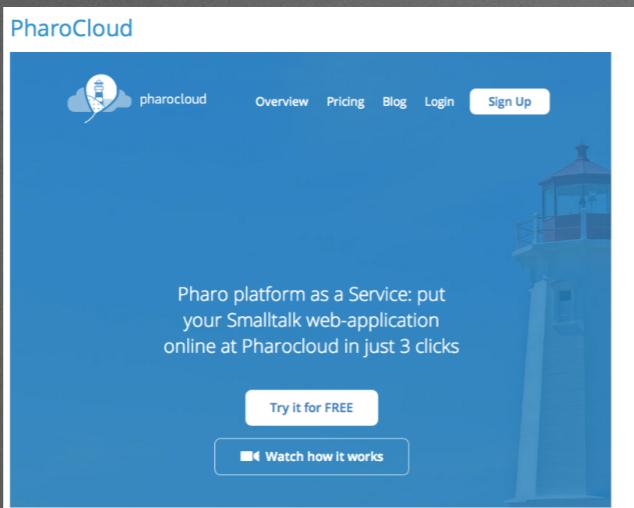


**An ecosystem where
innovation/business bloom**

... that ****you**** can make money with Pharo.

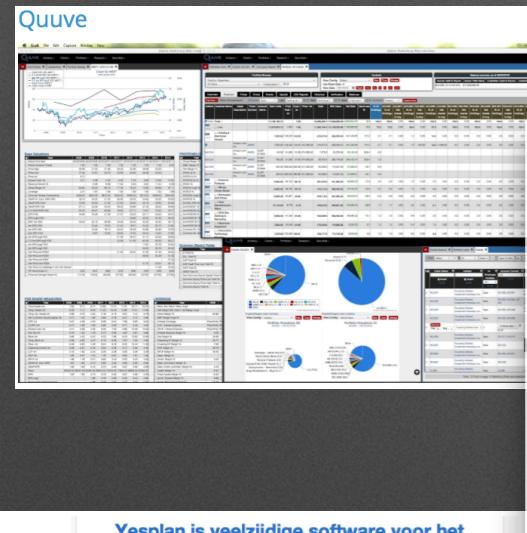
... to be able to invent solutions to existing problems.

... a powerful **innovative dynamic** language where we can build (y)our future.

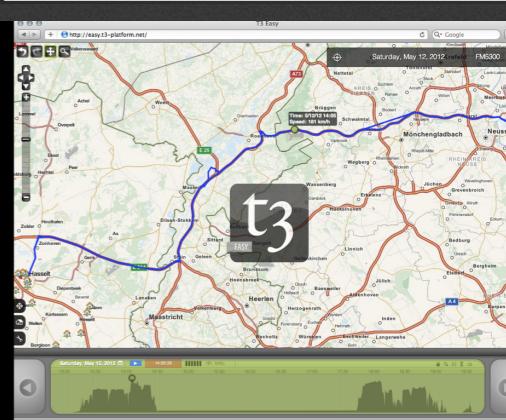
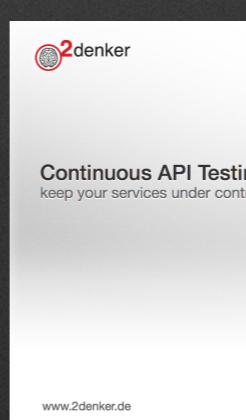
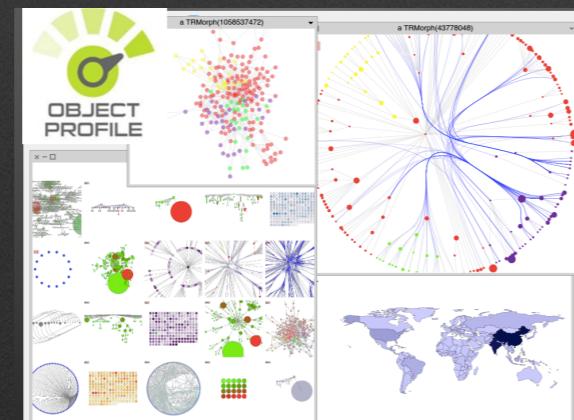
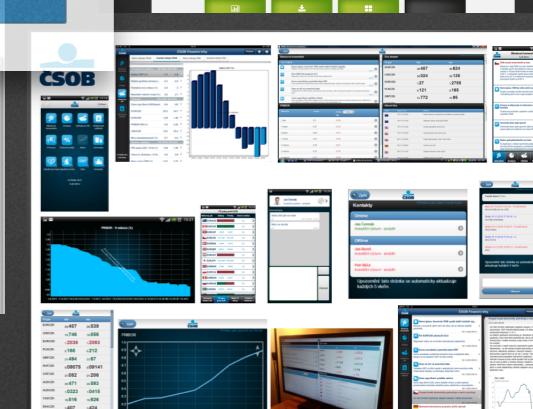
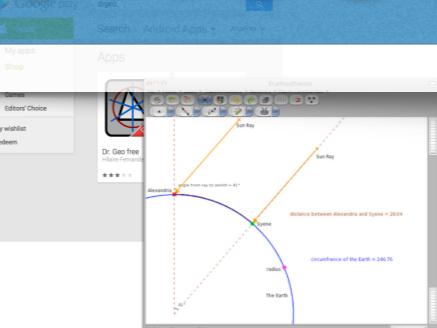
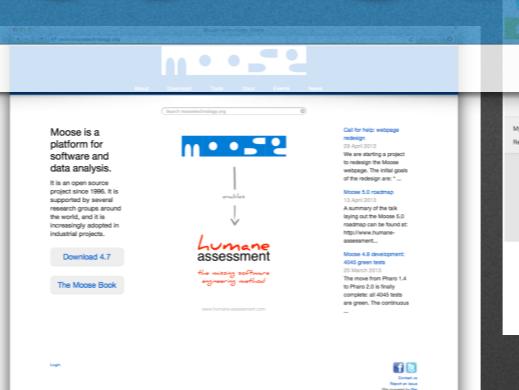
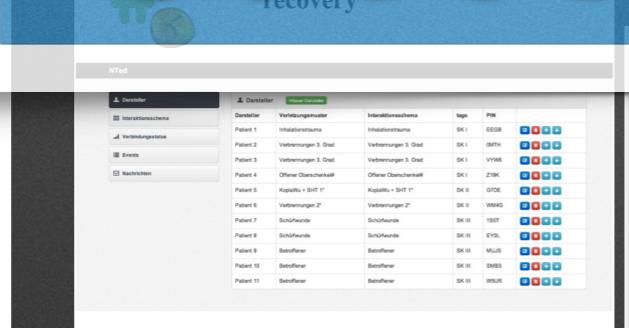
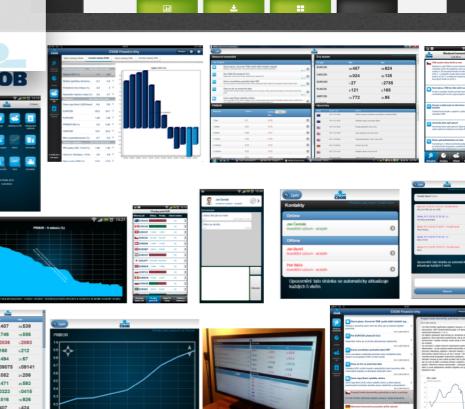


erstyle.ch

- 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



Some Success Stories



ALLSTOCKER

We find machines for you

+81-3-5847-8994

Asia's Largest Online Marketplace for Big Ma

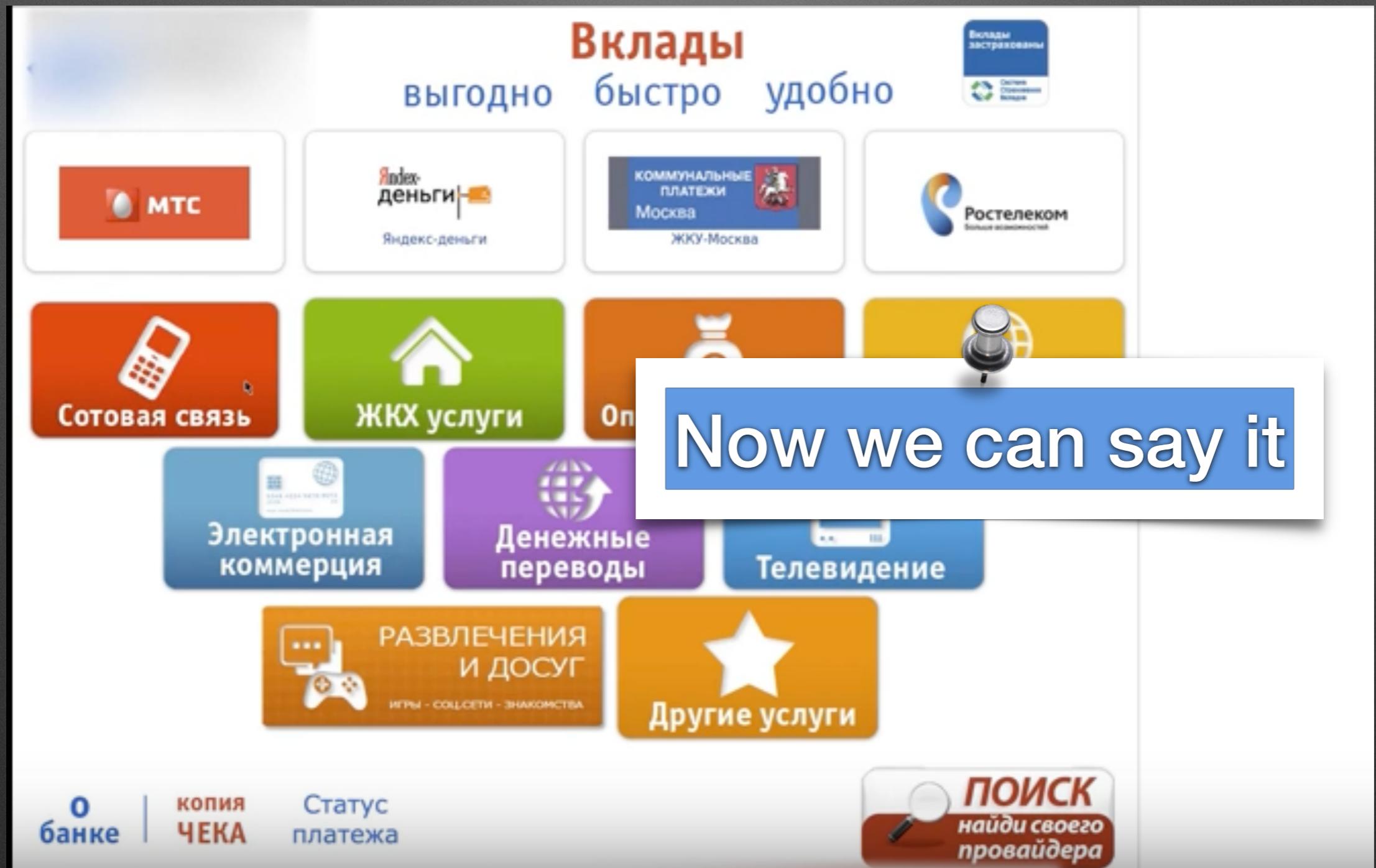
Used by over **30,000** Companies Mo

Online marketplace
raised 4.7 M\$
Find Machines **Search by Category****Construction Machinery****Material Handling****Farm Machinery****Vehicles****Others** **Search by Keyword**

Enter a keyword (e.g. KOMATSU PC200)

Search**New Machines** Updated on: 2016/09/13 17:46:18 (JST)[See More >](#)

Pharo in ATM like Device in Moscow



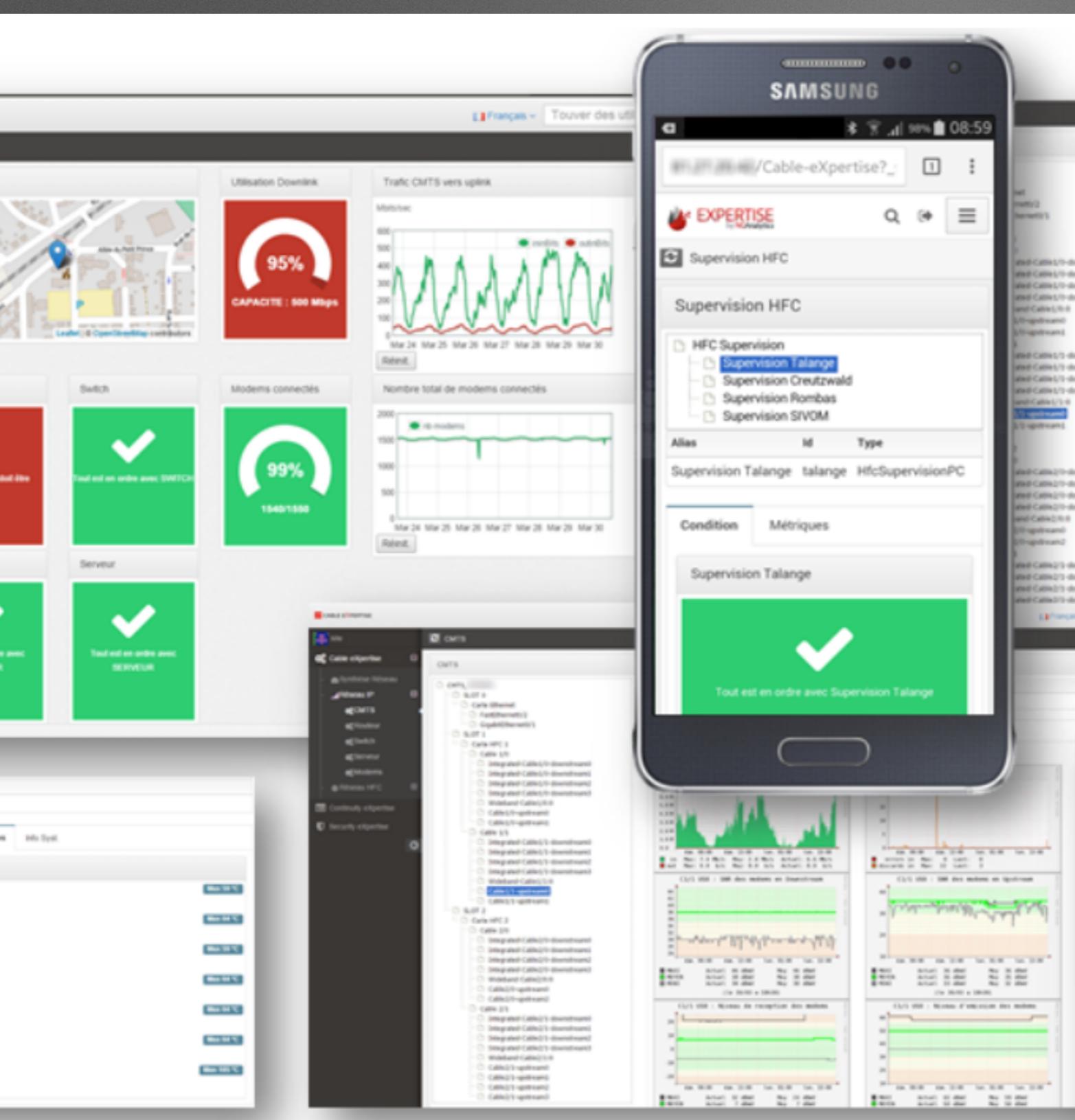


Saturday, May 12, 2012 14:05:29 181 km/u

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Network Monitoring for small ISPs

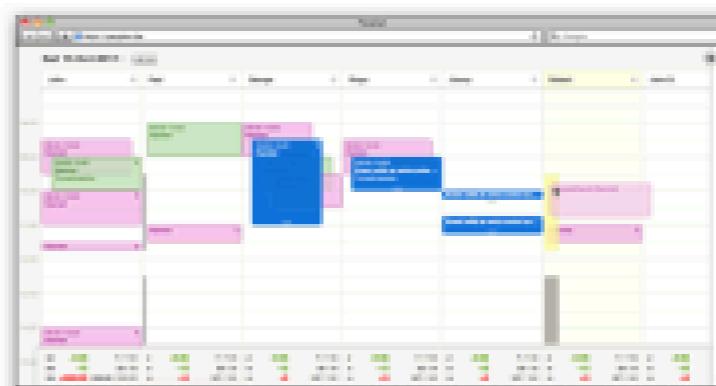
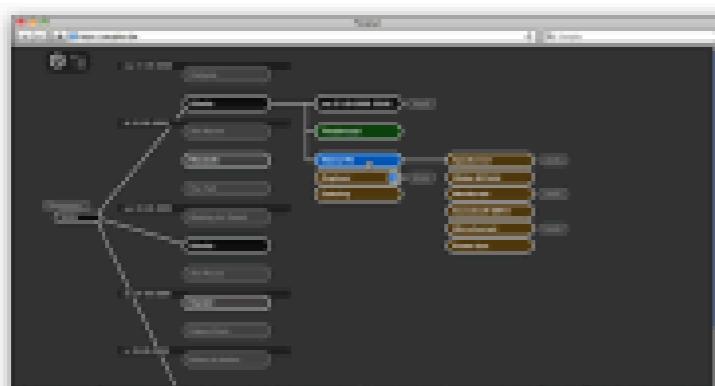
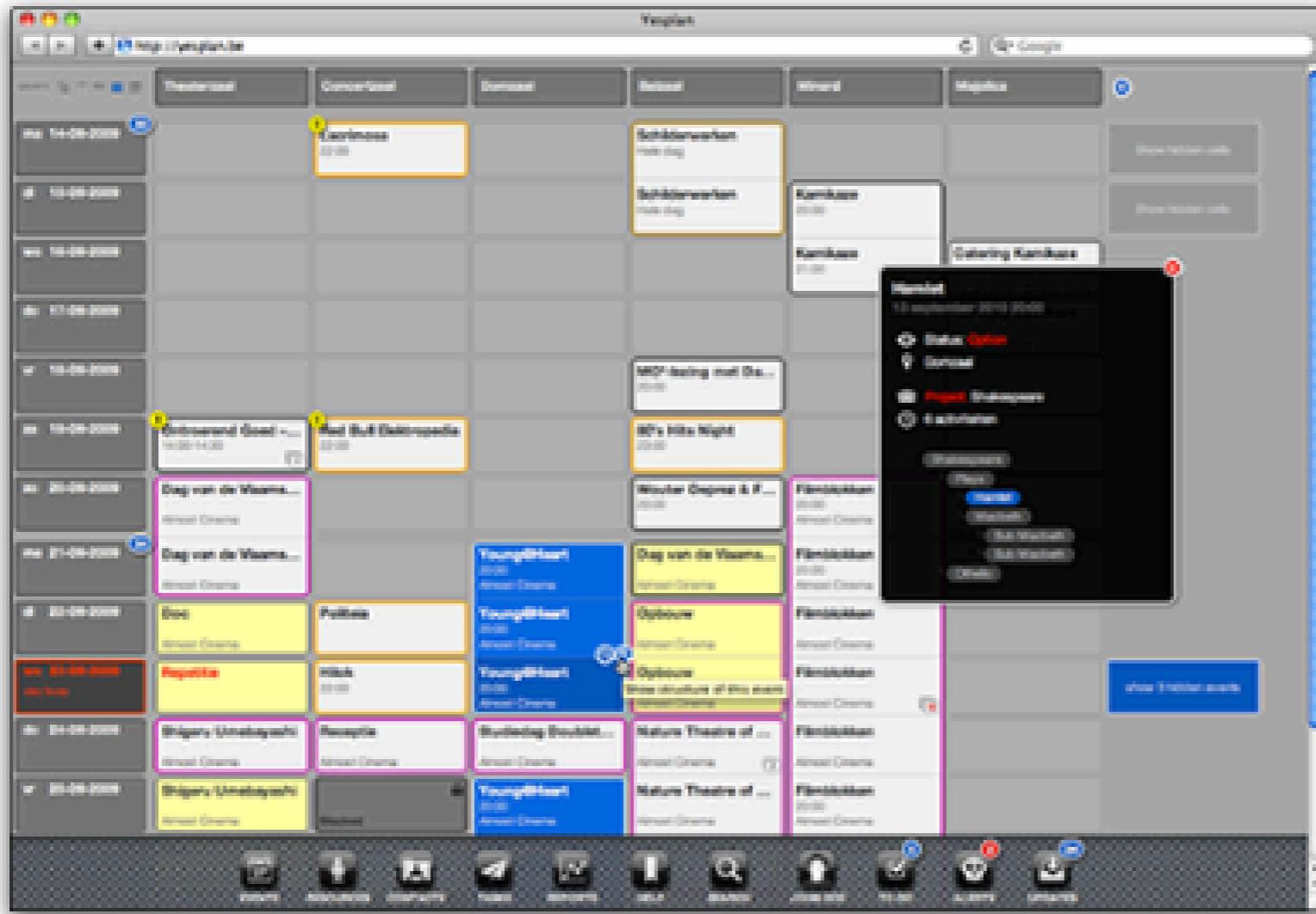


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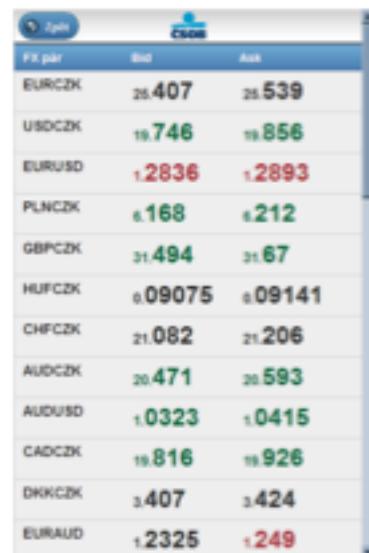
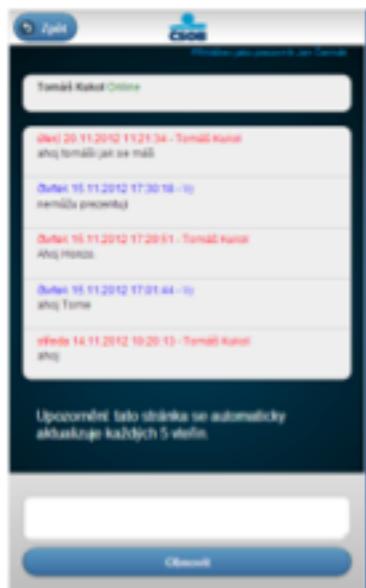
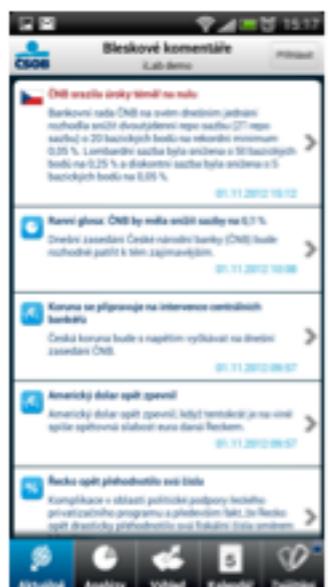
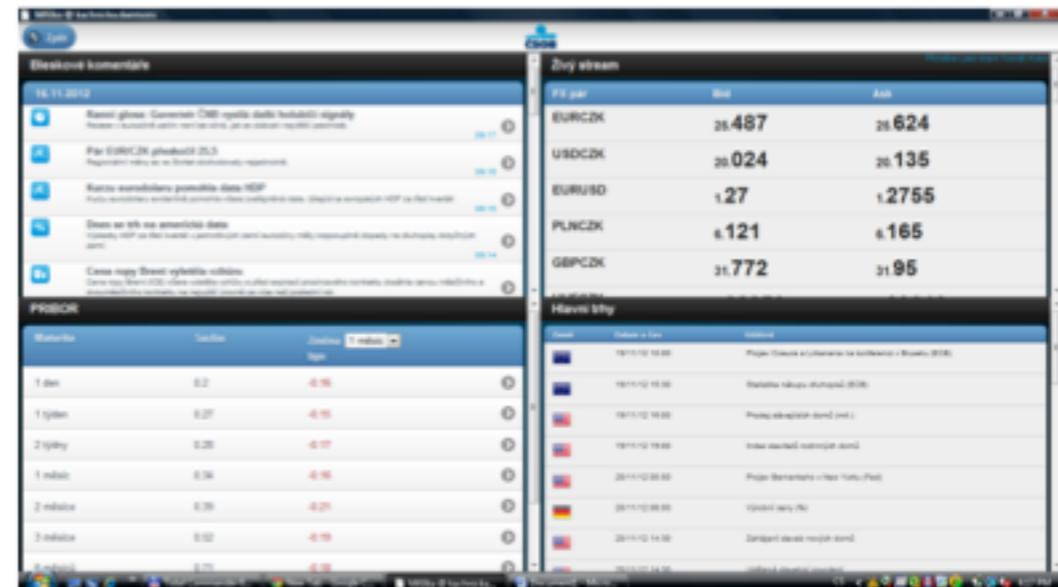
CMTS			
	Alias	N°	Type
CMTS_000000	CMTS_000000	SB-CMHS-02	Cmts
	Condition	Etat	Face Avant/Arière
			Températures
			Info Syst.
Façade de l'Équipement			
			
			

Yesplan is veelzijdige software voor het efficiënt plannen van evenementen.

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



Distributed
Resources
Management



Developed in 3 months one dev
Sold to another bank
Java team estimated 2 years

MobileTerminated ForwardSM

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

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 .
```

Free Software Mobile Communication solutions

Do it Print it

Extended search...
Do again
Undo

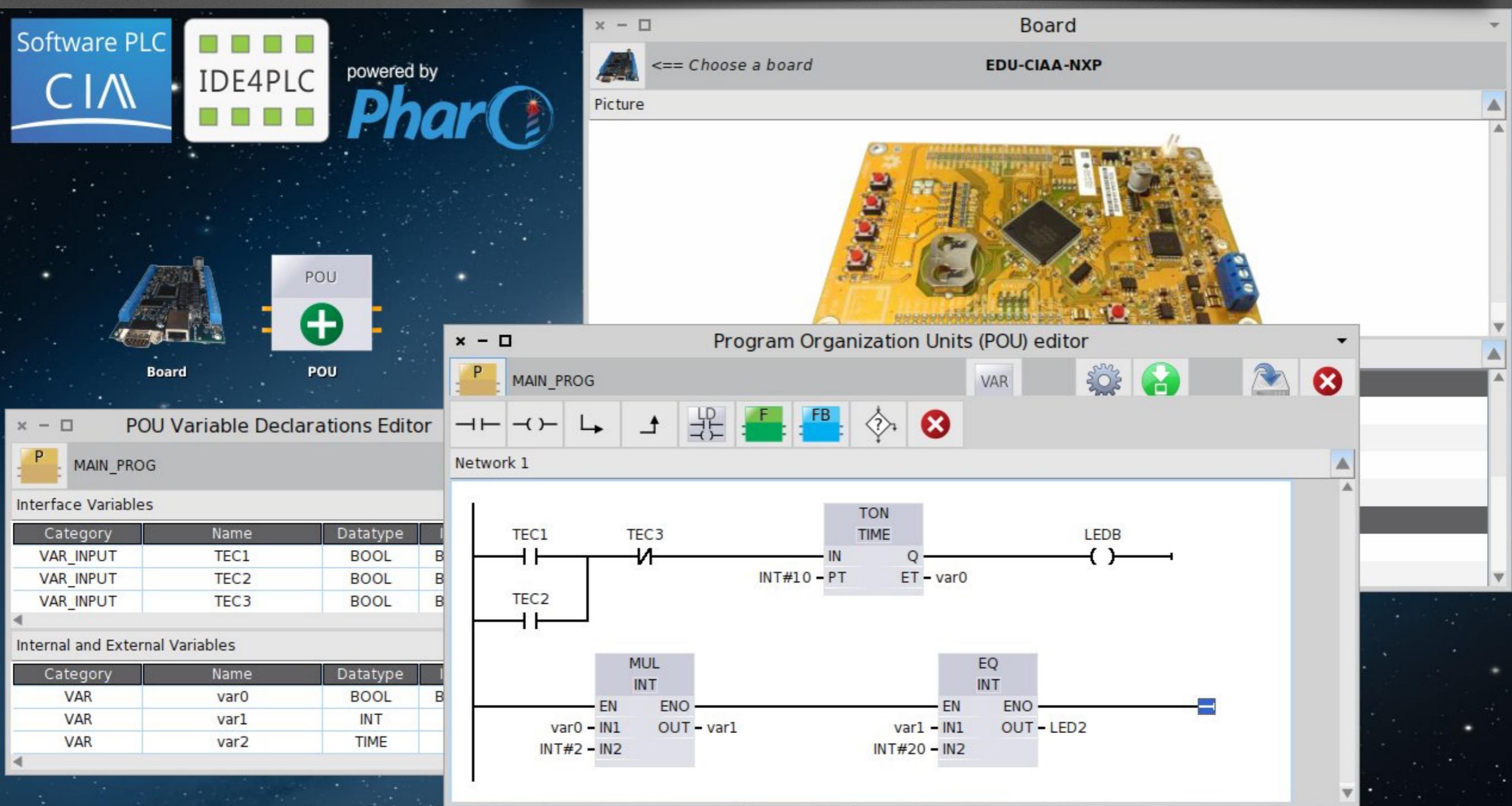
Apply a display filter ... <SE/>

No.	Time	Source	Destination	Protocol	Length	Info
1	8.000000	6	2000	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, Dst: 208.208.208.208
► Stream Control Transmission Protocol, Src Port: 2085 (2085), Dst Port: 2085 (2085)
► RTP/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-SRT: A status report shall be returned to the SME
 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

00000 62 89 48 84 01 00 00 00 6b 1e 20 1c 06 07 00 11 biH.... k.(....
00008 86 85 01 01 01 a8 11 00 0f 08 02 07 00 a1 00 06;
00016 07 84 00 00 01 00 19 02 6c 41 a1 3f 02 01 01 02 IA.?....
00024 01 2e 30 37 00 08 02 02 43 68 18 01 50 f9 84 08 ..07..b. Ch..P...
00032 91 94 51 97 10 00 00 00 04 21 24 0c 91 94 81 48 ..0..... .1\$....H
00040 13 65 42 00 00 51 18 71 21 95 53 00 10 c0 32 9b ..eB..U.q 1.50..2.
00048 fd 85 99 e5 ef 36 00 00 0e ch df 00R....

Programming environment for Programmable Logic Controllers





Apps

My apps

Shop

Games

Editors' Choice

My wishlist

Redeem

Search

Android Apps

All prices

Apps

Dr. Geo free
Hilaire Fernandes

Erathosthenes

File Points Lines Transformations Numerics Macro-construction

angle from ray to zenith = 41°

Alexandria

Syene

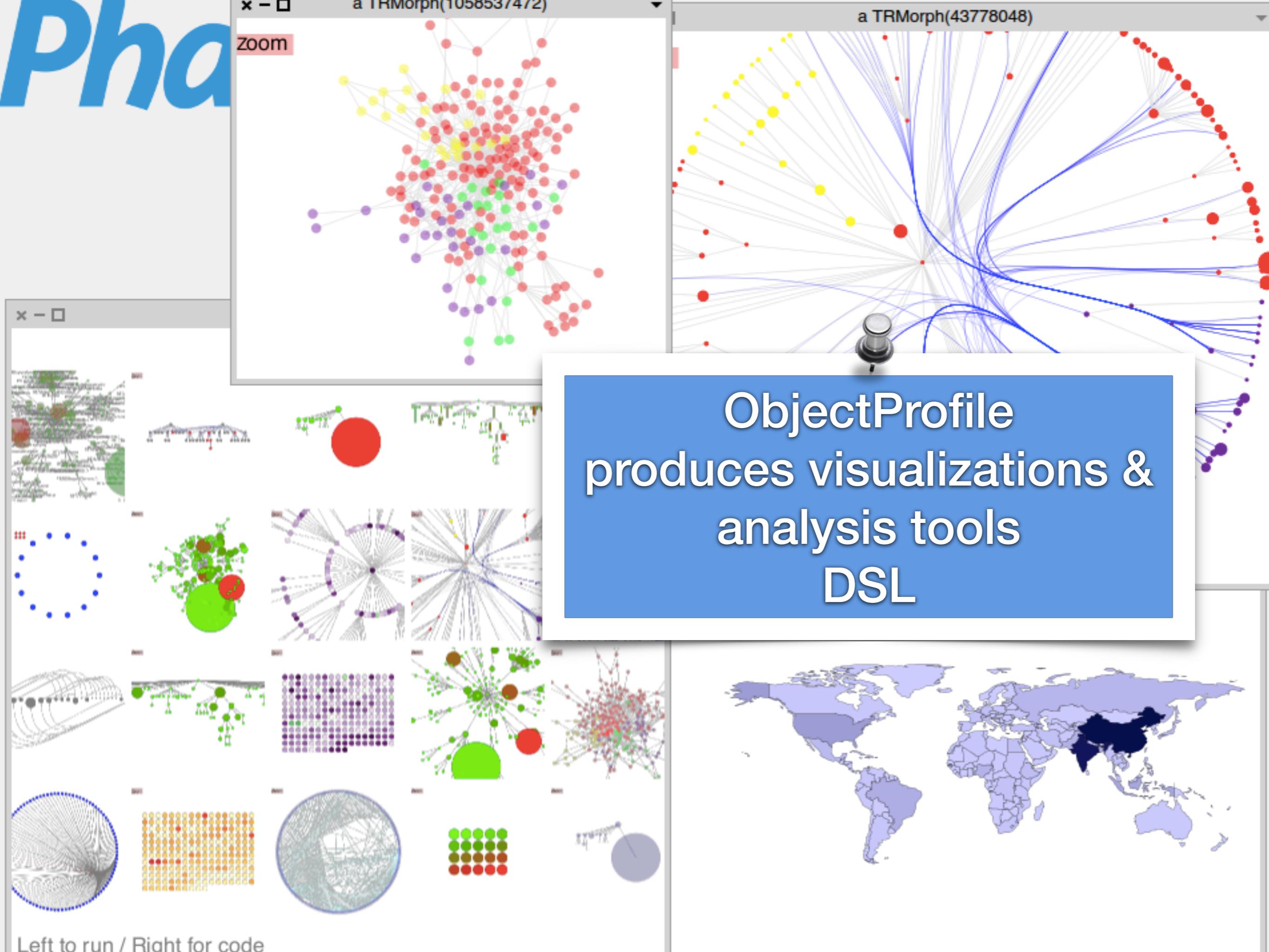
Sun Ray

Sun Ray

distance between Alexandria and Syene = 28.04

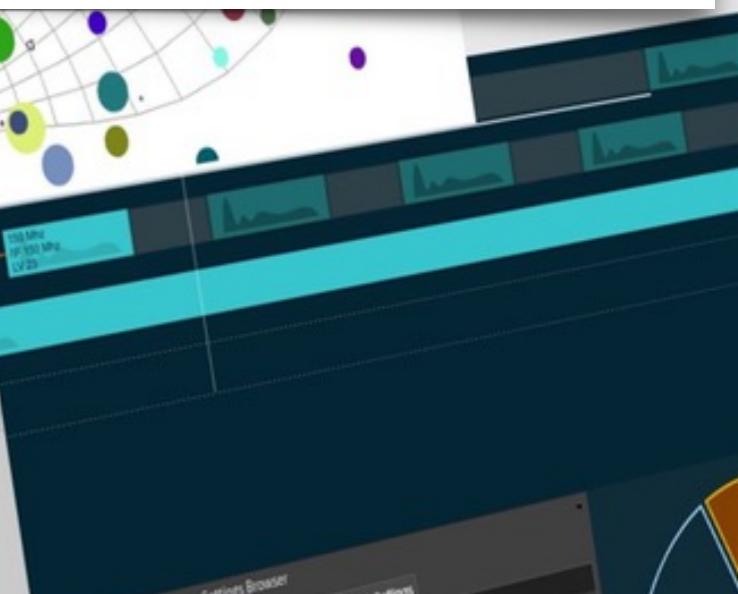
Select and move an object.

Works on linux, mac, windows, android, OLPC





Advanced UIs at Thales (flights, submarines,...) 2D, 3D, Tactile, VR,...





Manage travel costs

Spesenfuchs

Spesenfuchs ist eine Reisekostensoftware für jedermann. Einfach, schnell und kostenlos. Alle Pauschalen und gesetzlichen Regelungen sind hinterlegt. Es ist keine Registrierung notwendig!

Reisekosten clever abrechnen >

[Ohne Login benutzen](#)

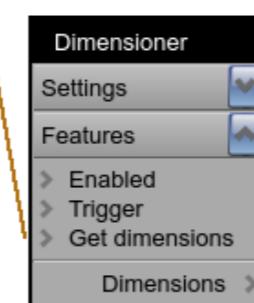
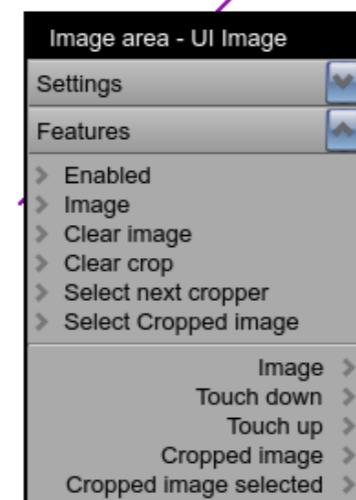
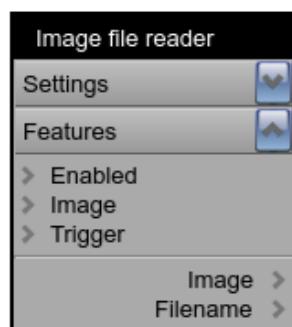
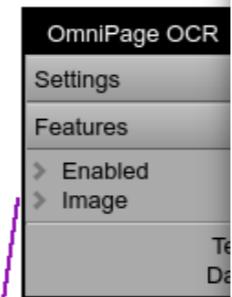
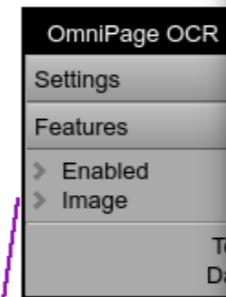
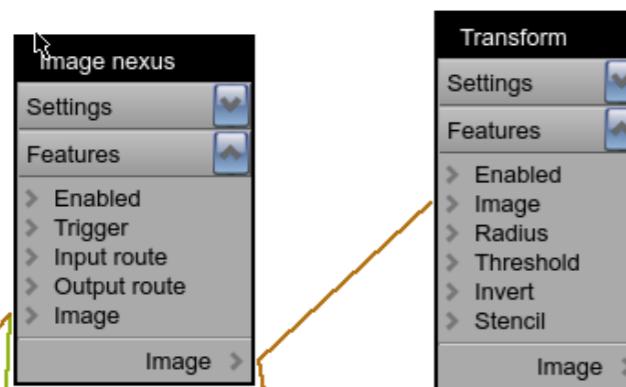
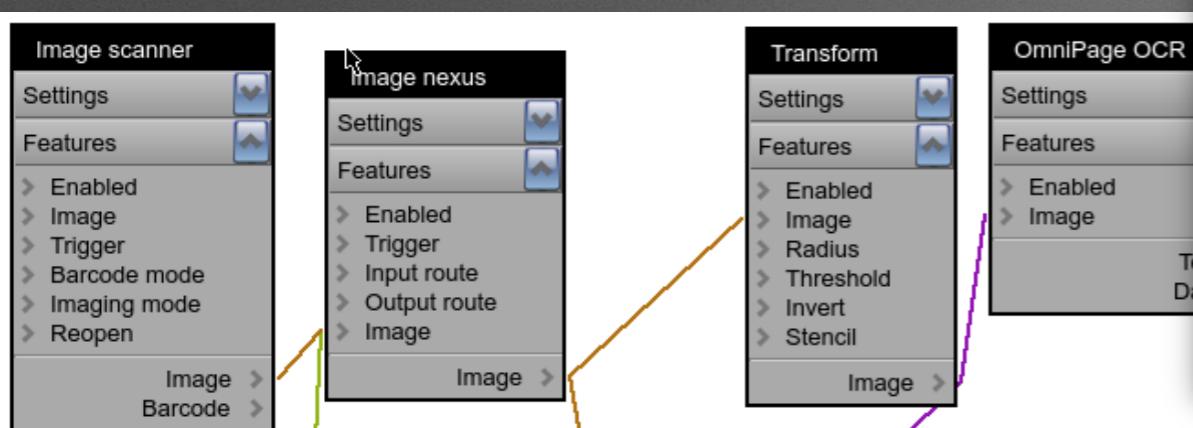
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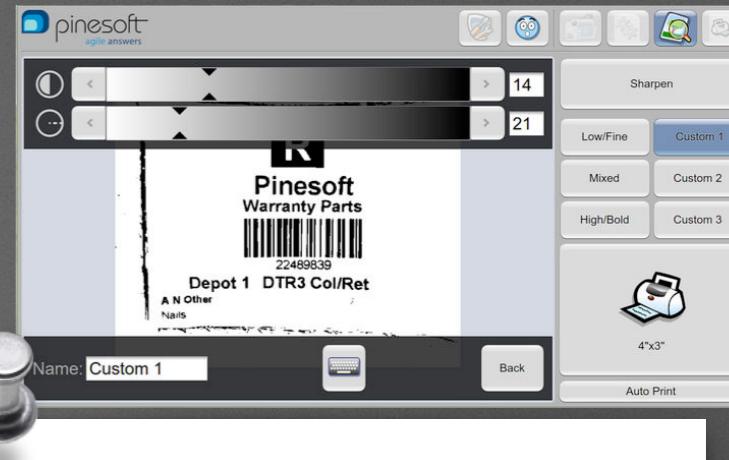
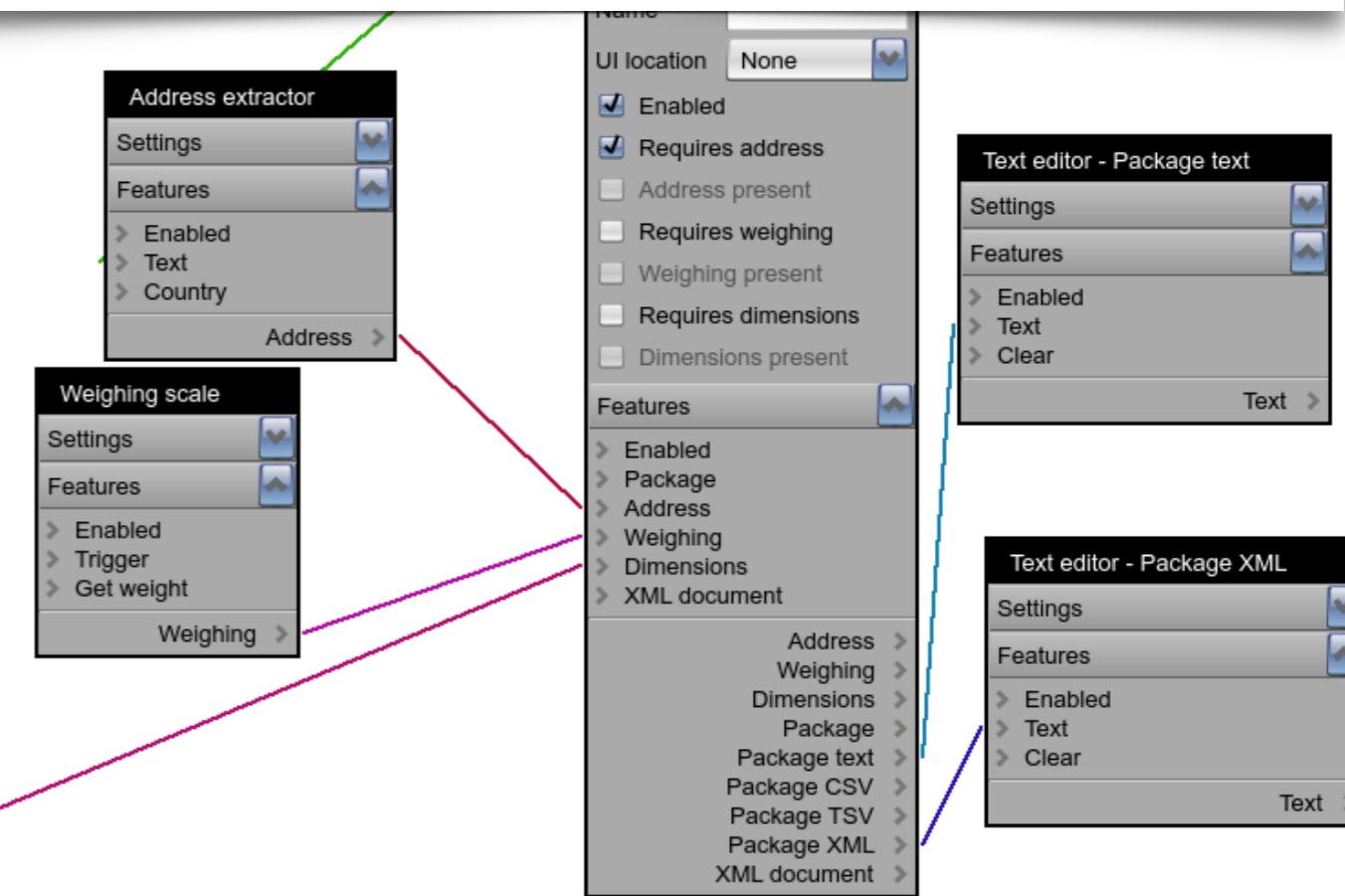
E-Mail

Passwort

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To handle return mails in Switzerland with a DataFlow extension of Pharo



A cool community



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 • 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. Maroua • Uni. of Lomé • INF1 • Uni. of Lyon • Uni. of Cagliari • Uni. of Cordoba • Uni. Ryerson • Uni. Comchabamba • Uni. Monterrey • USTH • ENIT

International Research Groups

Lafhis (AR)

SCG (CH)

CAR (FR)

RMOD (FR)

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Reveal (CH)

Lysic (FR)

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Soft-Qual (Serbia)

Uni. Quilmes (AR)

ENIT (FR)

Cochabamba (Bo)

Maroua (CAM)

ETS (CAN)

Since May 2008

Version	Release date	Major features
	March 16, 2008 [2]	Fork of Squeak environment
Pharo 1.0	April 15, 2010	real closures, EToys and MVC removed
Pharo 1.1	July 26, 2010	Cog JIT VM, Settings framework
Pharo 1.2	March 29, 2011	new Finder, Recent changes tool, improved Help, better themes
Pharo 1.3	August 2011	Zinc, headless images
Pharo 1.4	April 2012[3]	Ring metamodel, better code simulator
Pharo 2.0	March 18, 2013.[4]	browser improvements, QA tools, Fuel serializer, better files API
Pharo 3.0	April 2014.[5]	new modular compiler (Opal) and debugger, continuations
Pharo 4.0	April 2015.[6]	GTools, slots
Pharo 5.0	May 2016. [7]	Spur VM, UFFI, improved reflectivity
Pharo 6.0	6 June, 2017. [8]	64-bit and Git support
Pharo 6.1	24 July, 2017. [9]	improved Git support
Pharo 7.0	22 January, 2019. [10]	bootstrapping, new code browser (Calypso), stateful traits
Pharo 8.0	20 January, 2020. [11]	improved support of Git, testing, refactoring and Windows

Pharo in Numbers

Since 2008

Language Core + IDE +
Tools + Frameworks

710 packages (tests
included)

~ 25000 tests

5 platforms

9 400 classes

130 000 methods

61 Mb (64 bits)

[http://github.com/
pharo-project/Pharo](http://github.com/pharo-project/Pharo)
(~220 forks, 15/123
contributors)

Growing ecosystem
polymath
pharo-graphics
pharo-gis
pharo-container
pharo-ai



Pharo is our vehicle
We improve it everyday

Pharo
is yours

<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!



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.

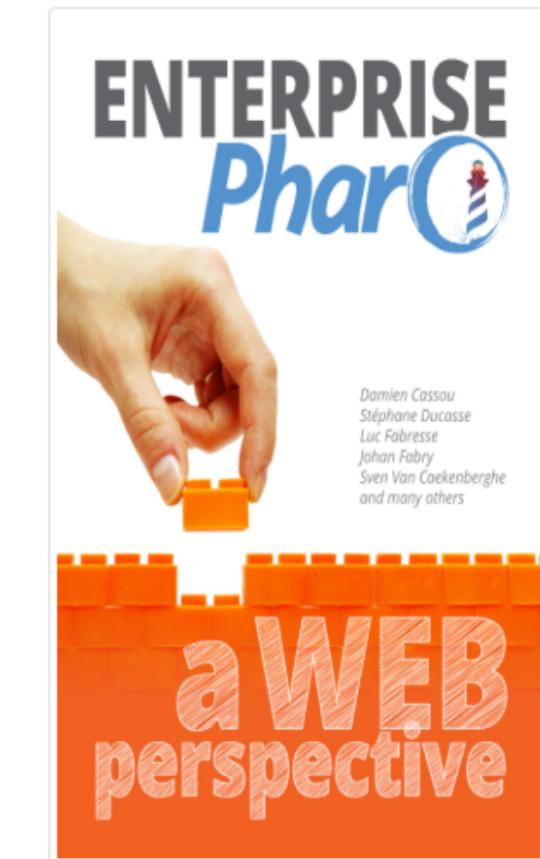
[View details »](#)



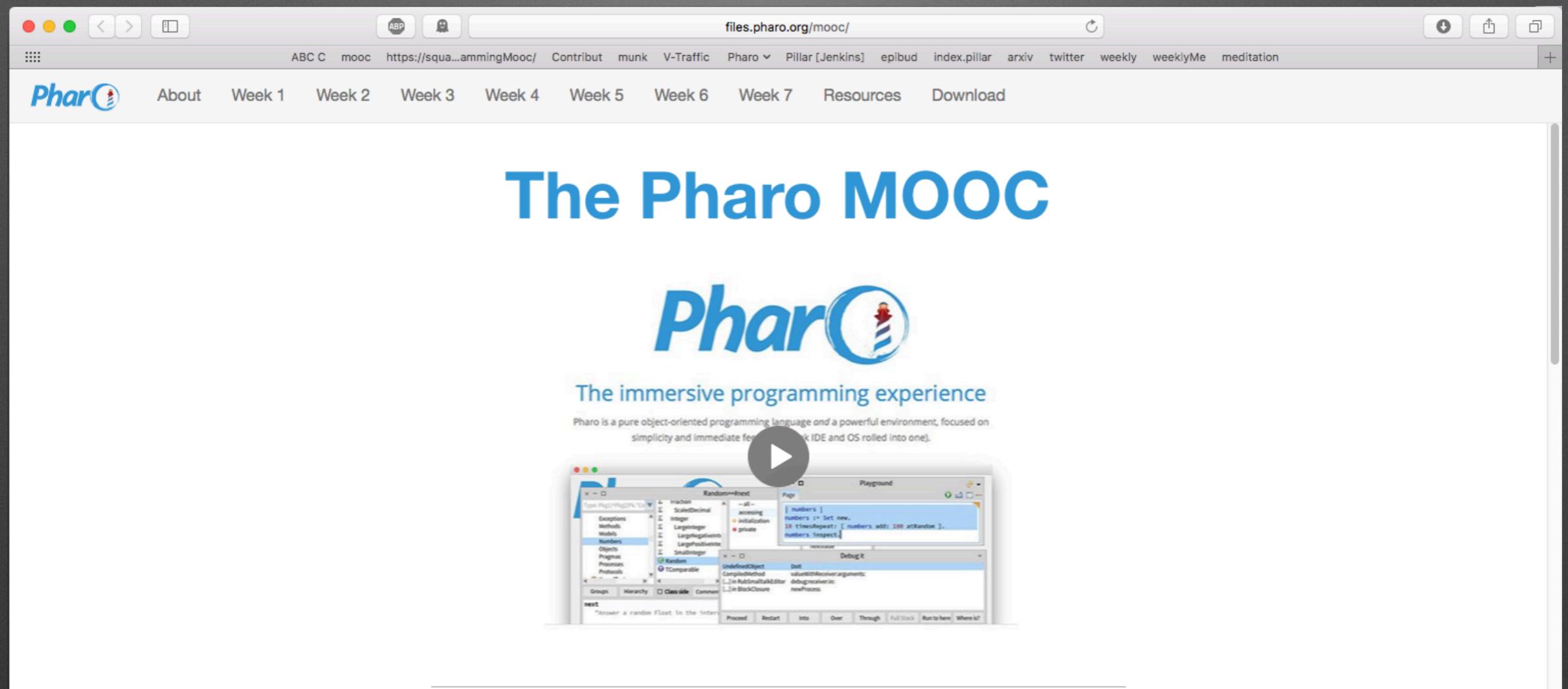
Enterprise Pharo is the third volume of the series. This book covers libraries and frameworks for enterprises, and in particular those doing web development.

[View details »](#)

TinyBlog: Un Tutorial Web en Pharo



<http://mooc.pharo.org>



The screenshot shows a web browser window for files.pharo.org/mooc/. The page title is "The Pharo MOOC". The Pharo logo, featuring the word "Pharo" in blue with a lighthouse icon, is prominently displayed. Below it is the tagline "The immersive programming experience". A video player is embedded in the page, showing a screenshot of the Pharo Smalltalk IDE. The IDE interface includes a class browser on the left, a playground with code in the center, and a debugger at the bottom. The playground contains code like `[numbers] numbers := Set new.` and `10 timesRepeat: [numbers add: 100 atRandom].`

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!

Pharo is a pure object-oriented programming language in the tradition of Smalltalk. It offers a unique developing experience in constant interaction with live objects. Pharo is elegant, fun to use and very powerful. It is very easy to learn and enables to understand advanced concept in a natural way. When programming in Pharo, you are immersed in a world of live objects. You have immediate feedback at any moment of your development on objects representing web applications, code itself, graphics, network. [More...](#)

Obtaining the MOOC

We strongly suggest to follow the MOOC during the next session on [France Université Numérique](#) that will start **October 16th, 2017** because you will have support from the teaching team.

Join the discord channel mooc on the Pharo community (Invitation at <http://discord.gg/Sj2rhxn>)

But, you can also access all ressources of this MOOC offline on:

<https://discord.gg/QewZMZA>

Pharo

FOR NEW USERS 9
learning-help
mooc +
PHARO
general
development
offtopic
iceberg
bootstrap
LIBRARIES
databases
polymath
roassal
roassal-scriptoftheday
seaside
moose
bloc 1
ai 1
ai-scriptoftheday

3 ONLINE
8

9

23 new messages since 9:59 AM on November 23, 2017 MARK AS READ

akgrant0710 Last Saturday at 11:21 AM
dict includesKey: 'a key'
Take a look through the testing protocol of Dictionary (and superclasses)

Peter Uhnak Last Saturday at 11:26 AM
@Marek Erben especially `at:ifPresent:`, `at:ifAbsentPut:` & co.

Marek Erben Last Saturday at 1:14 PM
Yeah, thank you @Peter Uhnak
One more question - is there some simple way to remove one occurrence of item in Bag collection?

Peter Uhnak Last Saturday at 1:34 PM
`remove:` should do it

Marek Erben Last Saturday at 1:35 PM
But it removes all the occurrences of item, doesn't it?

Yani Last Saturday at 2:20 PM
as in `script of the day >url>`

Peter Uhnak Last Saturday at 2:36 PM
@Marek Erben did you try? 😊
trying is for free 😊 (edited)

Message #mooc

ADMIN—3
Esteban Lorenzano
Juraj Kubelka
kilon Playing Elite: Dangerous

CHANNEL-ADMIN—7
Alexandre Bergel
Clement Bera
PhilBack
Stepharo
Torsten Bergmann ...
Tudor Girba
Yuriy Tymchuk

ONLINE—42
akgrant0710
AlejandroInfante
awarenghem
Benoit Verhaeghe

**https://
pharoweekly.wordpress.com**

https://pharoweekly.wordpress.com

ABC C mooc https://squa...mmingMooc/ Contribut munk V-Traffic Pharo Pillar [Jenkins] epibud index.pillar arxiv twitter weekly weeklyMe meditation

My Site Reader Write

WEEKLY NEWS ABOUT PHARO

Everything you wanted to know about <http://www.pharo.org> without being forced to read 1000 mails

HITCHHIKER'S GUIDE TO ... SMALLTALK, TIPS'N TRICKS COG BLOG ABOUT

NOV 25 2017

UNSORTED

EDIT

WHAT ABOUT CONTRIBUTING?

Here is the testimony of Astares regularly contributing to Pharo 70.

What is not visible in the list are the many enhancements happening also on Calypso, Bloc, Grease and many many others.

Nonetheless the core image still needs love from more people. Remember even the smallest change can make a difference and shape the future. Also "a contribution per day keeps bad systems away".

Even one contribution per week or month.

So jump in – the water is just fine!

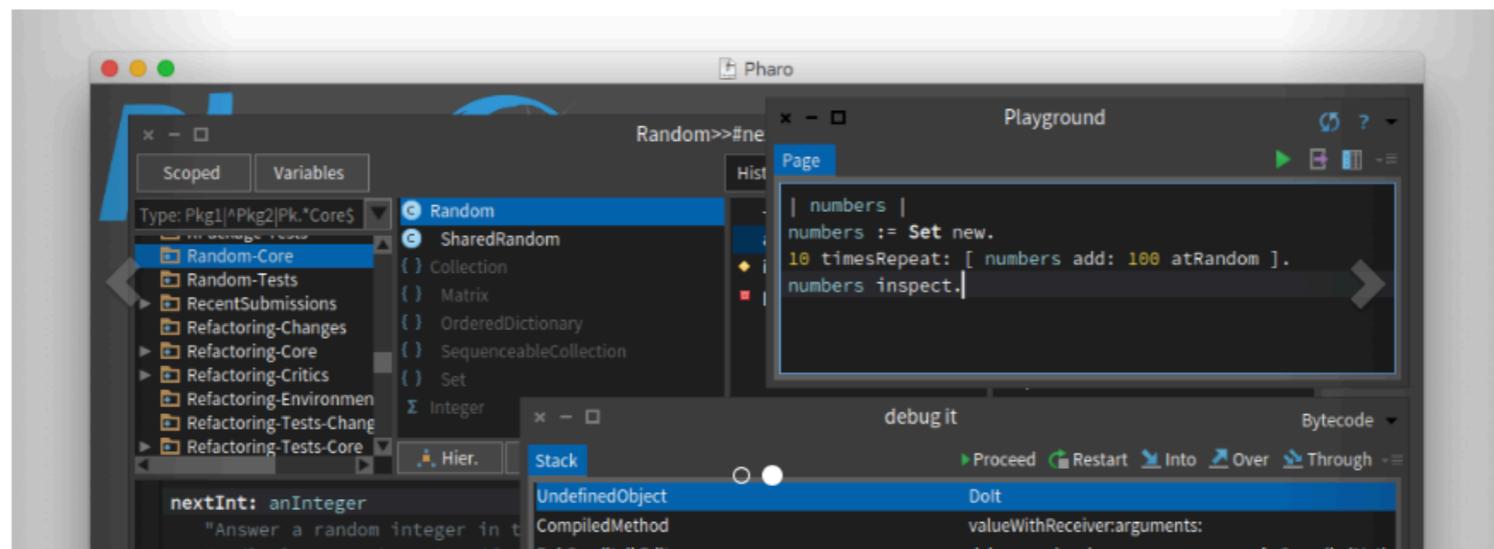
Bye
T. (aka astares)

NOV 22 2017 | PHARO 7.0A1 NEXT ENHANCEMENTS 2



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).

[Discover](#)[Download](#)[Learn](#)

Learn more about Pharo's key [features](#) and elegant design.

Download latest version (8.0)!
Read more about [here](#)

Access the Pharo Mooc!
3000 people registered and follow the Pharo Mooc. You can find it [here](#).
Watch the [teaser](#)!