A master class:

“Live objects for complex projects with Pharo”

http://stephane.ducasse.free.fr
http://www.pharo.org

SCHMIDT
Ingenieurbüro für Bauwesen

esug
EUROPEAN SMALLTALK USER GROUP

Inria
INVENTEURS DU MONDE NUMÉRIQUE

ENSTA Bretagne

THALES

ZWEIDENKER

Yesplan
Let's make it happen

Lam RESEARCH

Lifeware

SpesenFuchs

projector software

GemTalk SYSTEMS

feenk

netstyle.ch

osoco software company

inspired!

BetaNine
software engineering

telna

HR works

FINWORKS
INFORMATION TECHNOLOGY SOLUTIONS

OBJECT PROFILE

OBJECT GUILD

TA MÈRE SCRL
BADASS MOBILE DEVELOPMENT

Systems that make sense
Sensus

MINES Douai
IA Informatique et Automatique

FAST
Fundación Argentina de Smalltalk

b
UNIVERSITÄT BERN

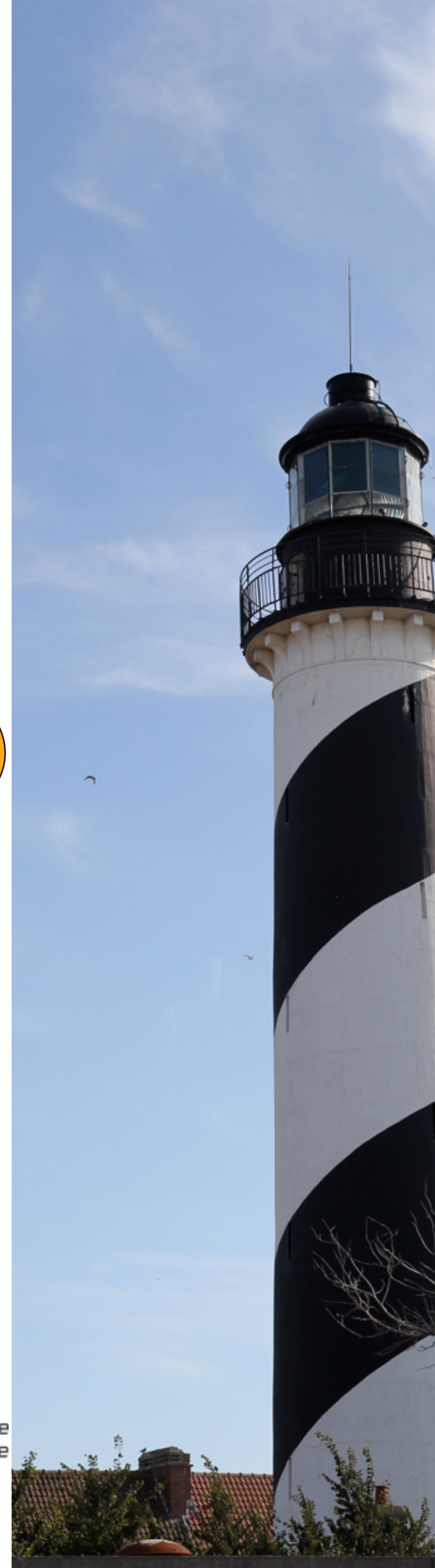
Pleiad

project uqbar

RMod

lifl
Laboratoire d'Informatique Fondamentale de Lille

CZECH TECHNICAL UNIVERSITY IN PRAGUE



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

Pharo

```
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].

	{ -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 ].

	^ x < y
```

https://www.pharo.org

PLACE STAMP HERE

.....

.....

.....

.....

.....

Yes the full Syntax!

Yes there is nothing else…

Pharo

```
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PLACE STAMP HERE

https://www.pharo.org

.....

.....

.....

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	^ x < y
```

method

annotation

```
exampleWithNumber: x
```

parameter

```
<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].
```

comment

```
{ -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 ].

^ x < y
```

return

```
exampleWithNumber: x
```

parameter

```
<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].
```

local var

affectation

instance var

```
{ -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 ].

^ x < y
```

local var

```
exampleWithNumber: x

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

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

	y := thisContext stack size + super size.

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

closure

```
{ -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 ].

^ x < y
```

arg closure

```
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.

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	{ -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 ].

	^ x < y
```

binary msg

keyword msg

unary msg

cascade

separator

binary msg

```
exampleWithNumber: x

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

	true & false not & (nil isNil)
	 ifFalse: [ self perform: #add: with: x ].

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	{ -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 ].

	^ x < y
```

array character

symbol

string

number

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!"

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

Immersed and interacting with live objects

Workspace

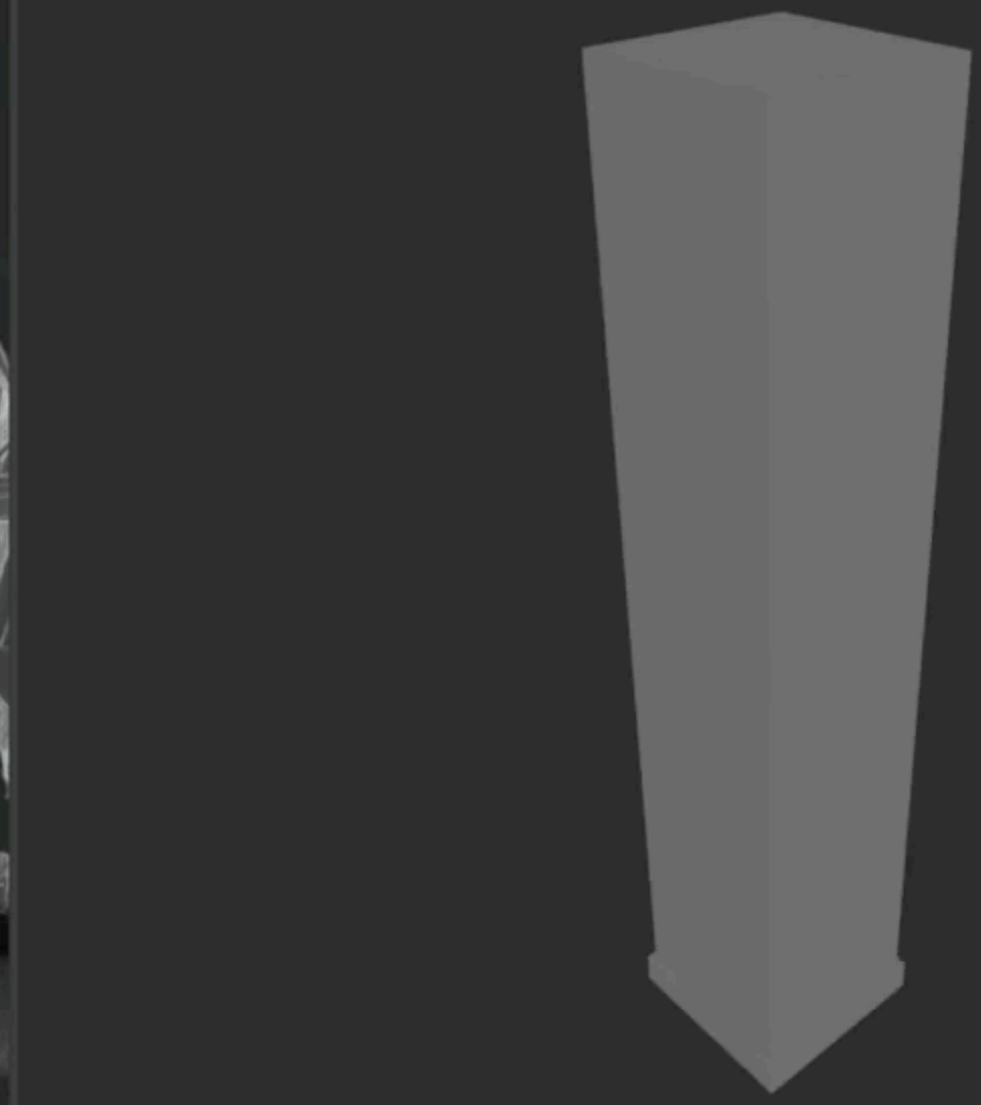
```
| elements lay |


elements := (1 to: 5) collect: [ :ob |
  (R3CubeShape new) elementOn: ob ].


lay := R3WallLayout new.
lay on: elements.

UberPresenter present: elements
```

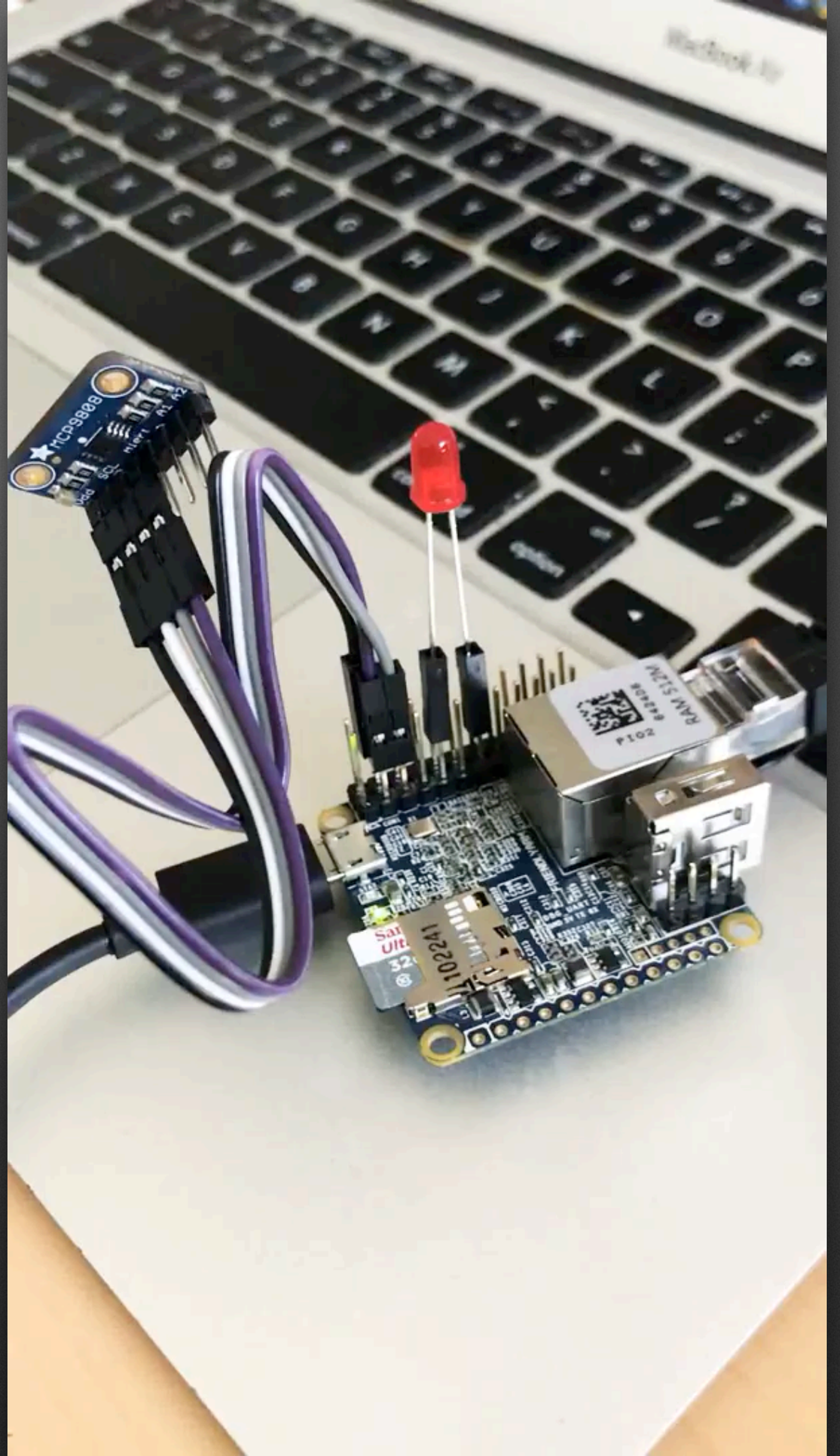
Uber Presenter



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

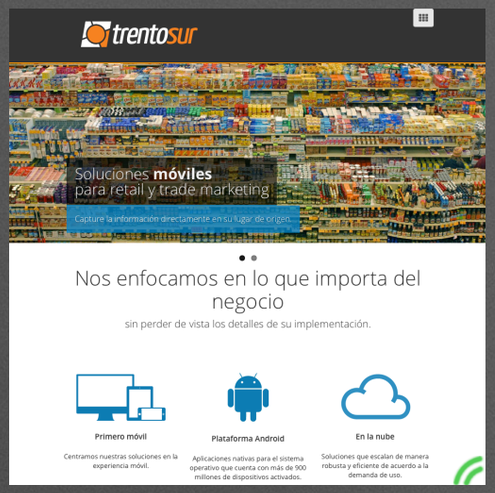
An ecosystem where innovation/business bloom

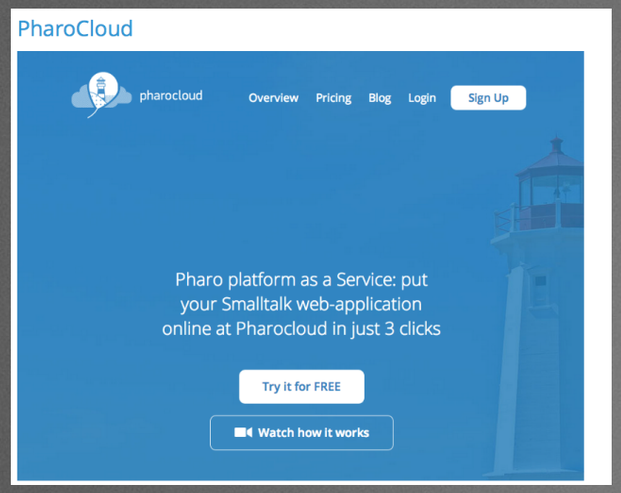
… that **you** can make money with Pharo.

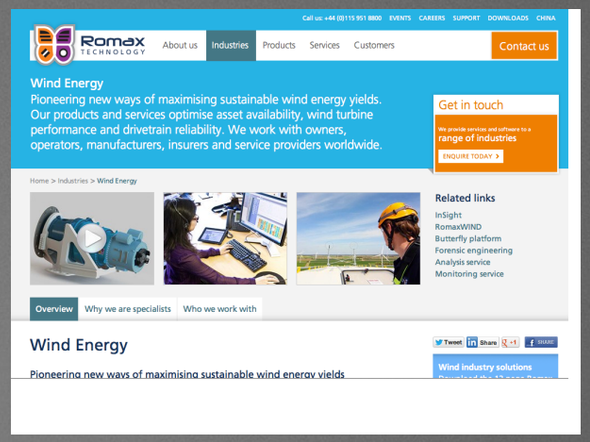
… to be able to invent solutions to existing problems.

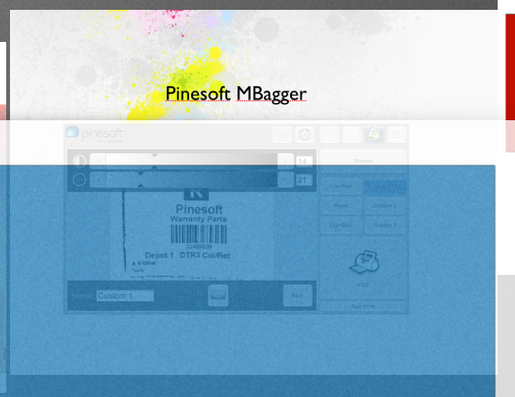
… a powerful innovative dynamic language where we can build (y)our future.

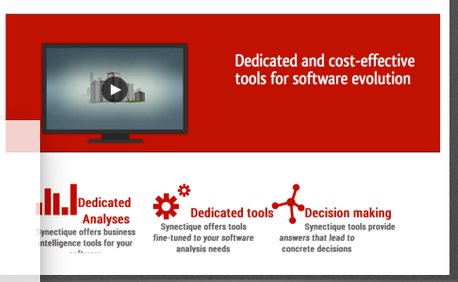
Some Success Stories

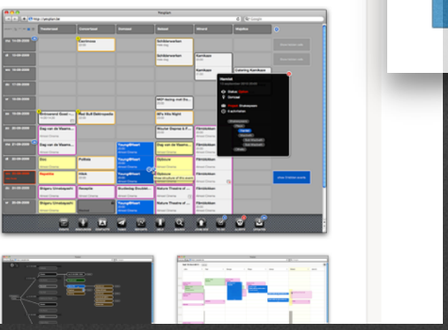


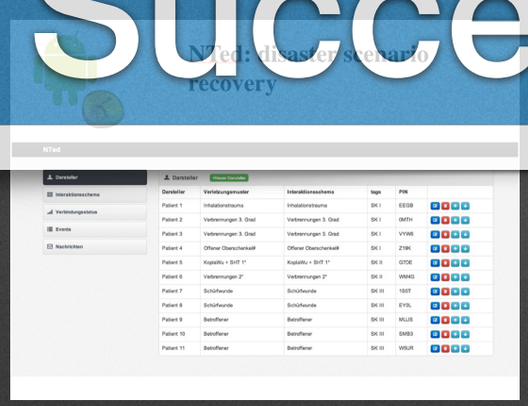


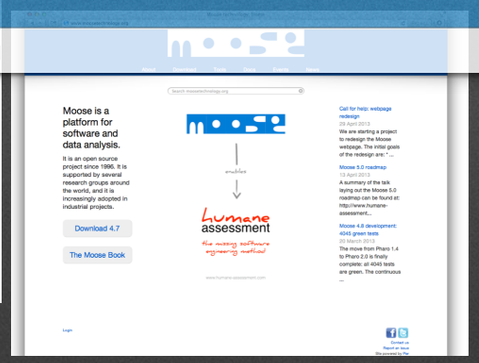


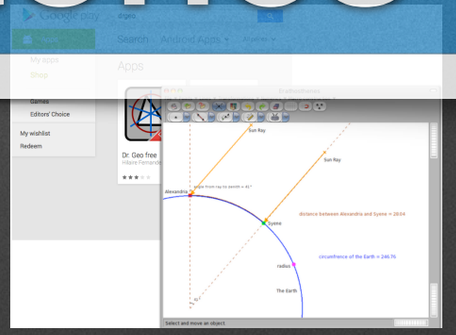


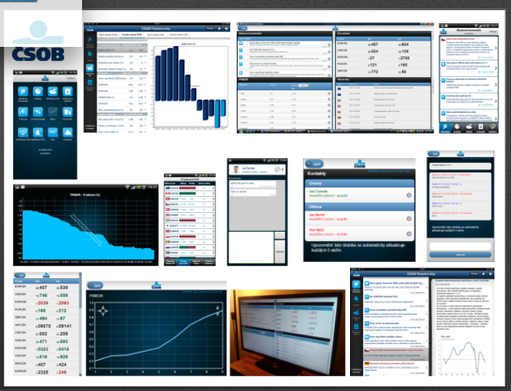


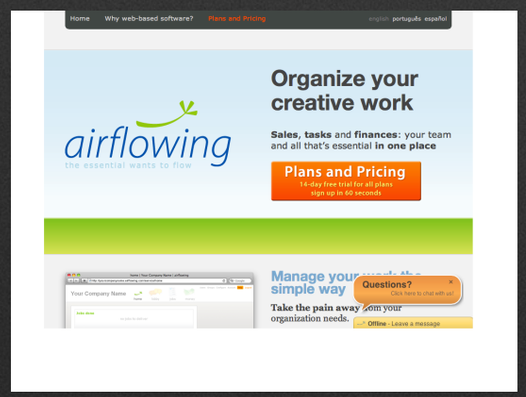


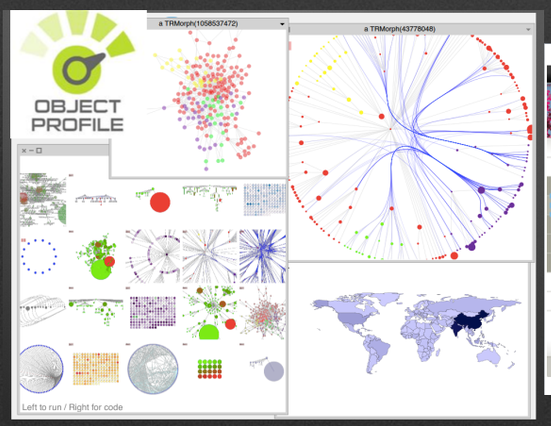


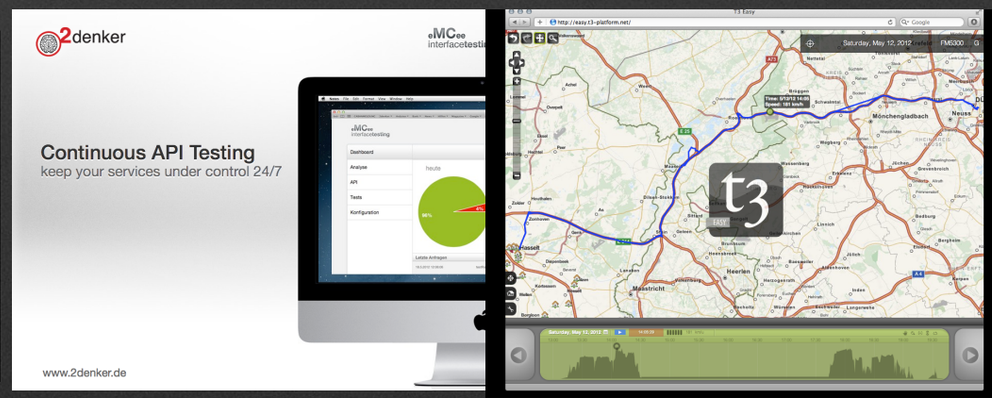












Asia's largest online marketplace for used construction equipment and machinery

How to Buy Login English

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

- Mini Excavators
- Excavators
- Wheel Loaders
- Dozers
- Cranes
- Rollers
- Graders
- Finishers
- Generators
- Welders
- Compressors
- Small Items
- Other Construction Machineries

Material Handling

- Forklifts

Farm Machinery

- Tractors
- Other Farm Machinery

Vehicles

- Dumps
- Trucks
- Other Vehicles

Others

- Attachments
- Parts
- 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 ›

HOKUETSU
PDS175S
400,000 JPY

KUBOTA
U-55-6
3,500,000 JPY

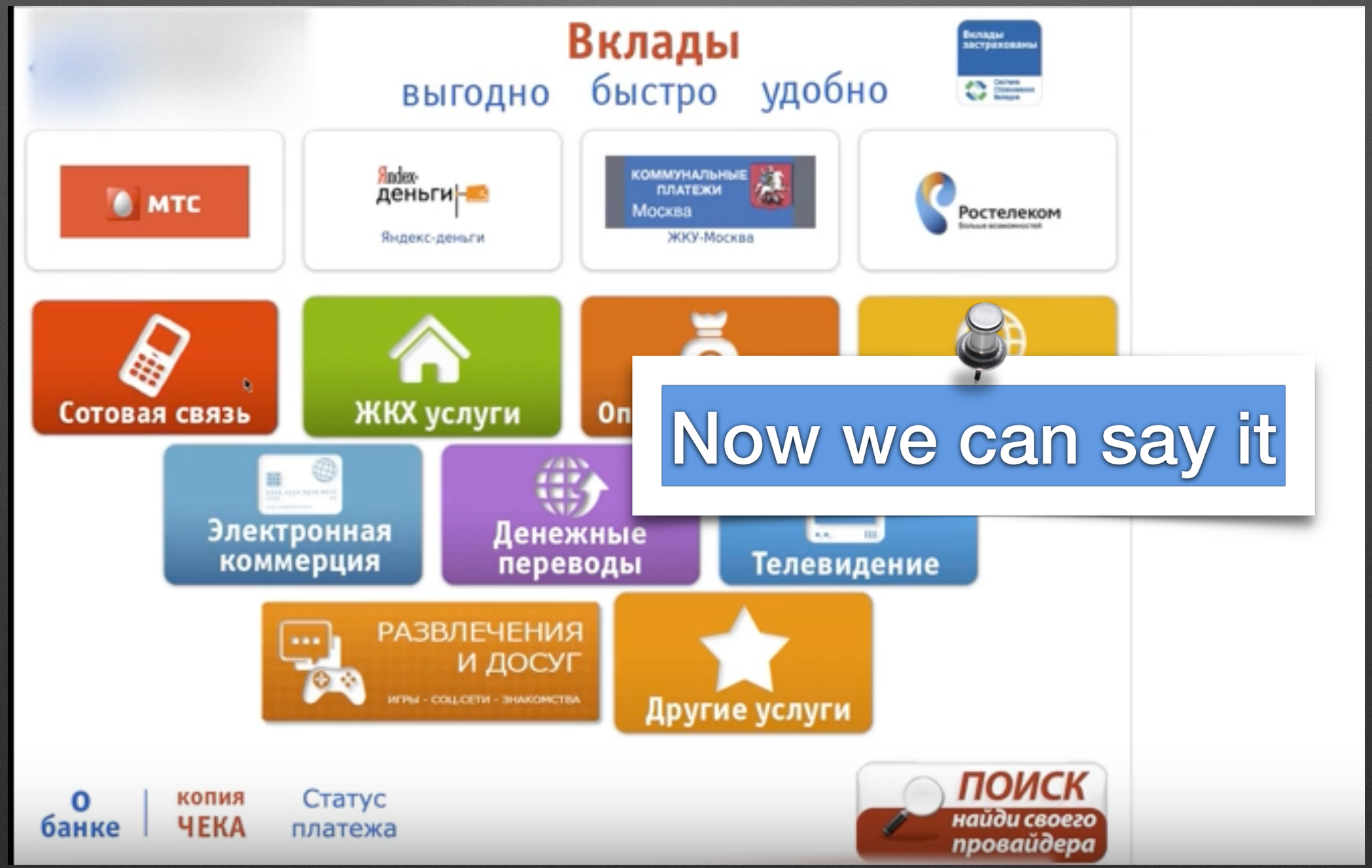
OTHER
MGR2500
133,100 JPY

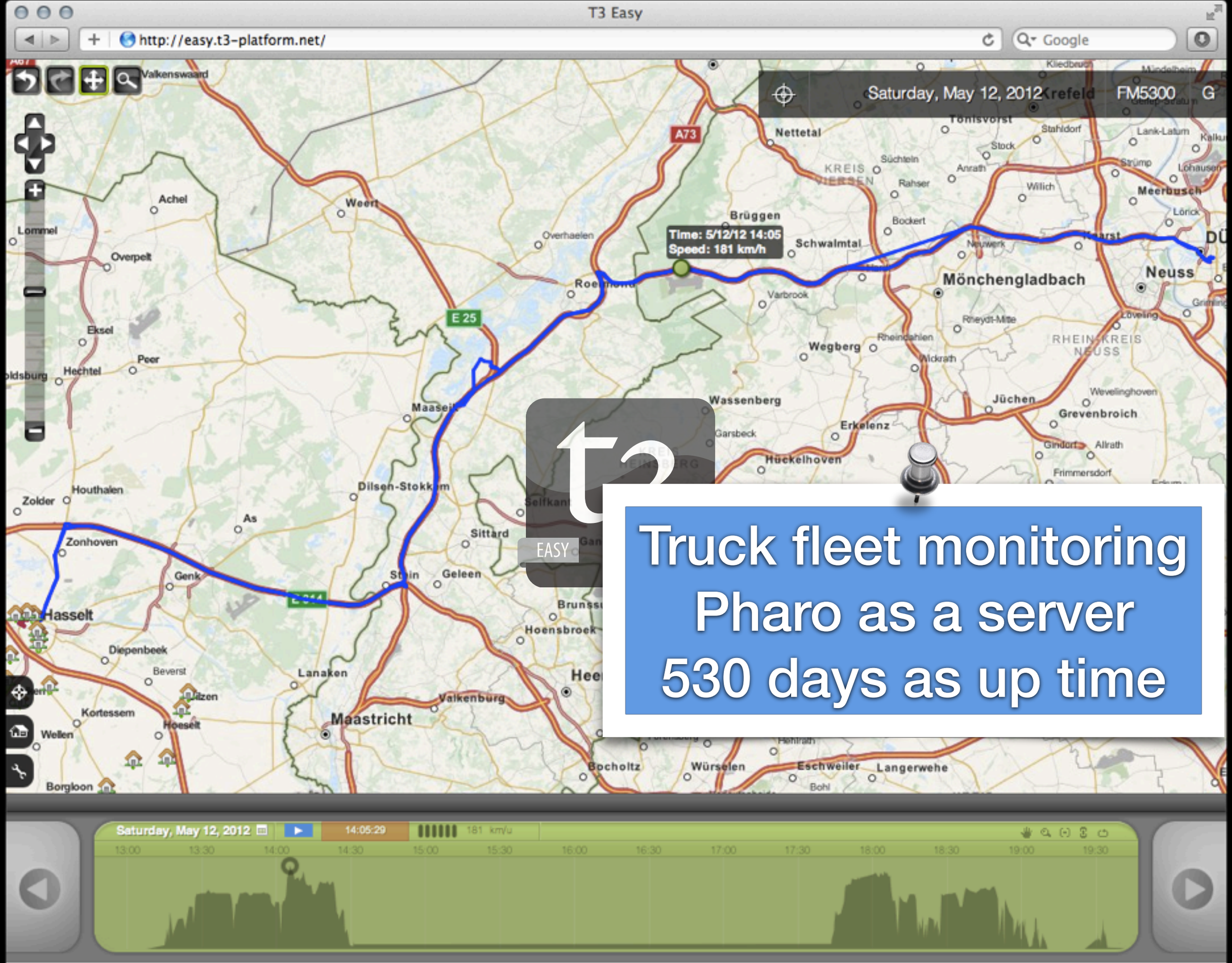
ISEKI
HL407G
198,000 JPY

OTHER
MR6500
143,000 JPY

OTHER
GH250-GML
165,000 JPY

Pharo in ATM like Device in Moscow

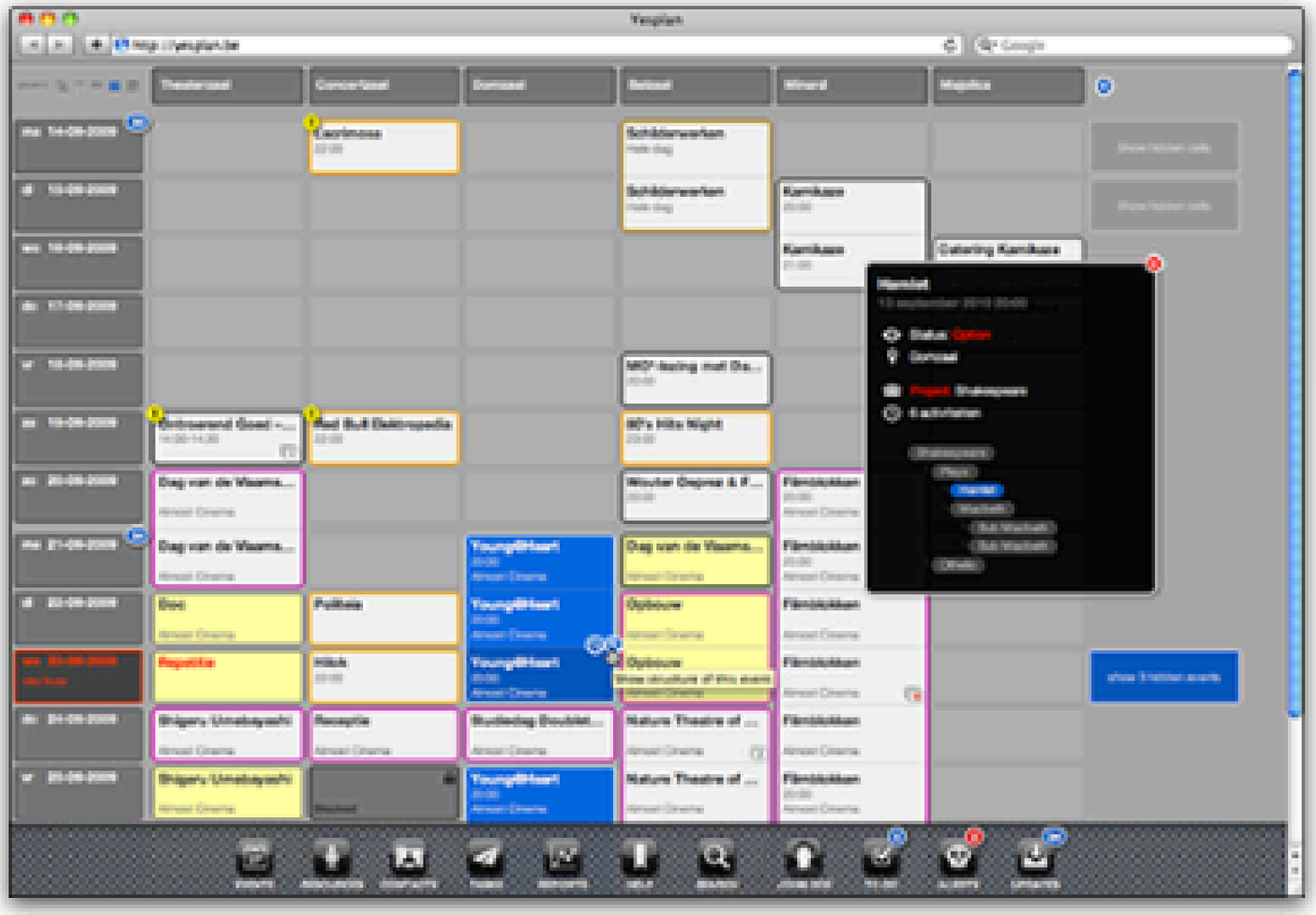



T3 Easy
http://easy.t3-platform.net/
Google
Saturday, May 12, 2012
FM5300
G
Time: 5/12/12 14:05
Speed: 181 km/h
A73
E 25
Nettetal
Brüggen
Schwalmtal
Mönchengladbach
Neuss
Meerbusch
Krefeld
Weert
Roermond
Maastricht
Hasselt
Genk
Sittard
Geleen
Wassenberg
Erkelenz
Hückelhoven
Jüchen
Grevenbroich
Wegberg
Rheindahlen
Wickrath
Rheydt-Mitte
Viersen
Würselen
Eschweiler
Langerwehe
Bocholtz
Valkenburg
Lanaken
Dilsen-Stokkem
Houthalen
Zonhoven
Diepenbeek
Kortessem
Wellen
Borgloon
Achel
Lommel
Overpelt
Eksel
Peer
Hechtel
Overhaelen
Varbrook
Garsbeck
Süchteln
Anrath
Willich
Rahser
Bockert
Stock
Tönisvorst
Stahldorf
Lank-Latum
Strümp
Lörick
Lohausen
Gindorf
Allrath
Frimmersdorf
Wevelinghoven
Rheinkreis Neuss
Kreis Viersen
EASY
Truck fleet monitoring
Pharo as a server
530 days as up time
Saturday, May 12, 2012
14:05:29
181 km/u
13:00
13:30
14:00
14:30
15:00
15:30
16:00
16:30
17:00
17:30
18:00
18:30
19:00
19:30

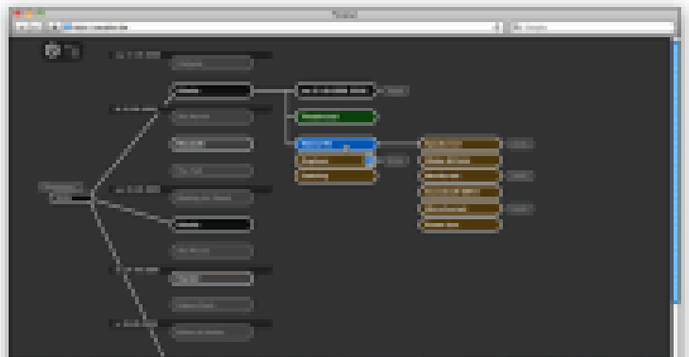
Network Monitoring for small ISPs

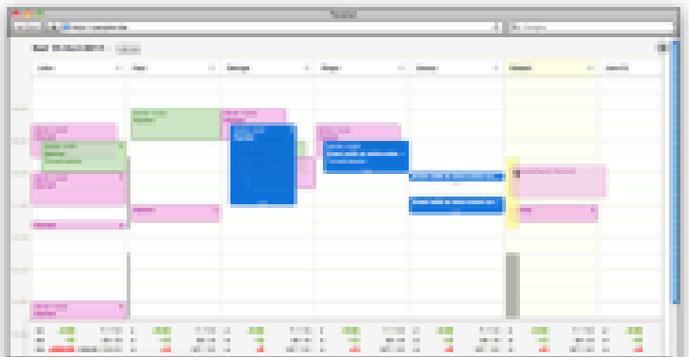
Yesplan is veelzijdige software voor het efficiënt plannen van evenementen.

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

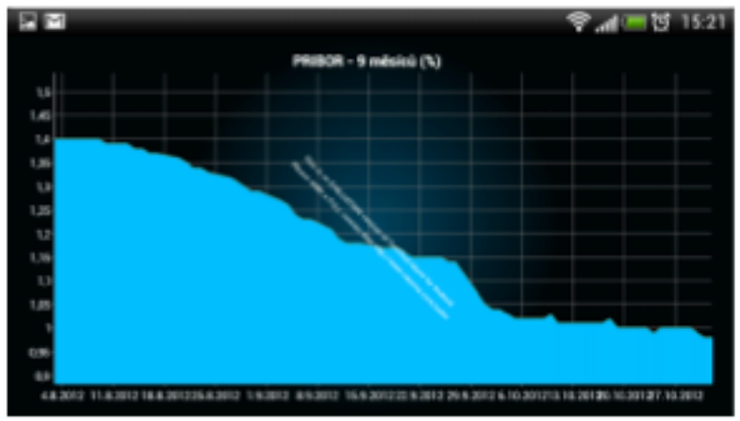


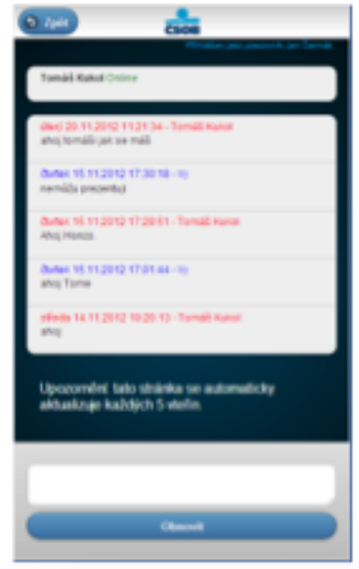
Distributed Resources Management

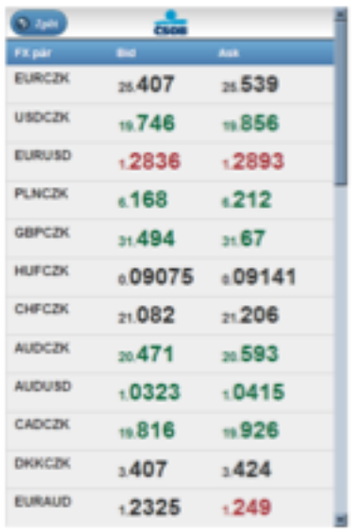




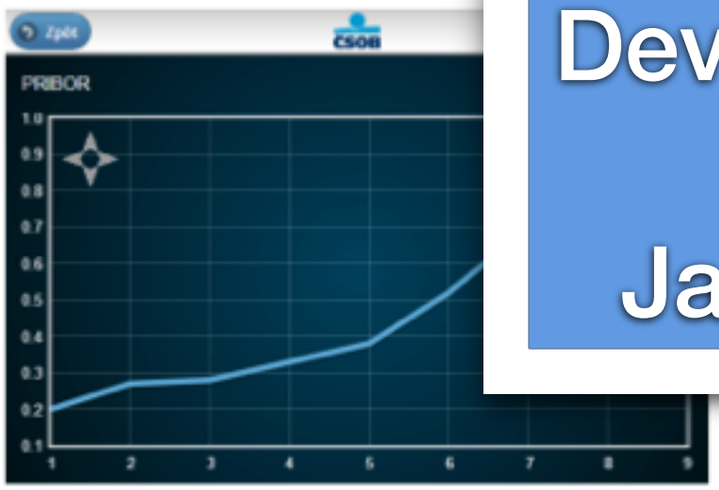
ČSOB

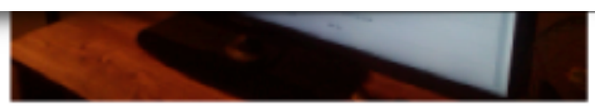






FX pár	Bid	Ask
EURCZK	25.407	25.539
USDCZK	19.746	19.856
EURUSD	1.2836	1.2893
PLNCZK	6.168	6.212
GBPCZK	31.494	31.67
HUFCZK	0.09075	0.09141
CHFCZK	21.082	21.206
AUDCZK	20.471	20.593
AUDUSD	1.0323	1.0415
CADCZK	19.816	19.926
DKKCZK	3.407	3.424
EURAUD	1.2325	1.249





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: '240c91948148136542000051107121955340 10c8329bfd0699e5ef3
        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 d
Print it p
Extended search...
Do again j
Undo z

Free Software Mobile Communication solutions

Apply a display filter ... <⌘/>

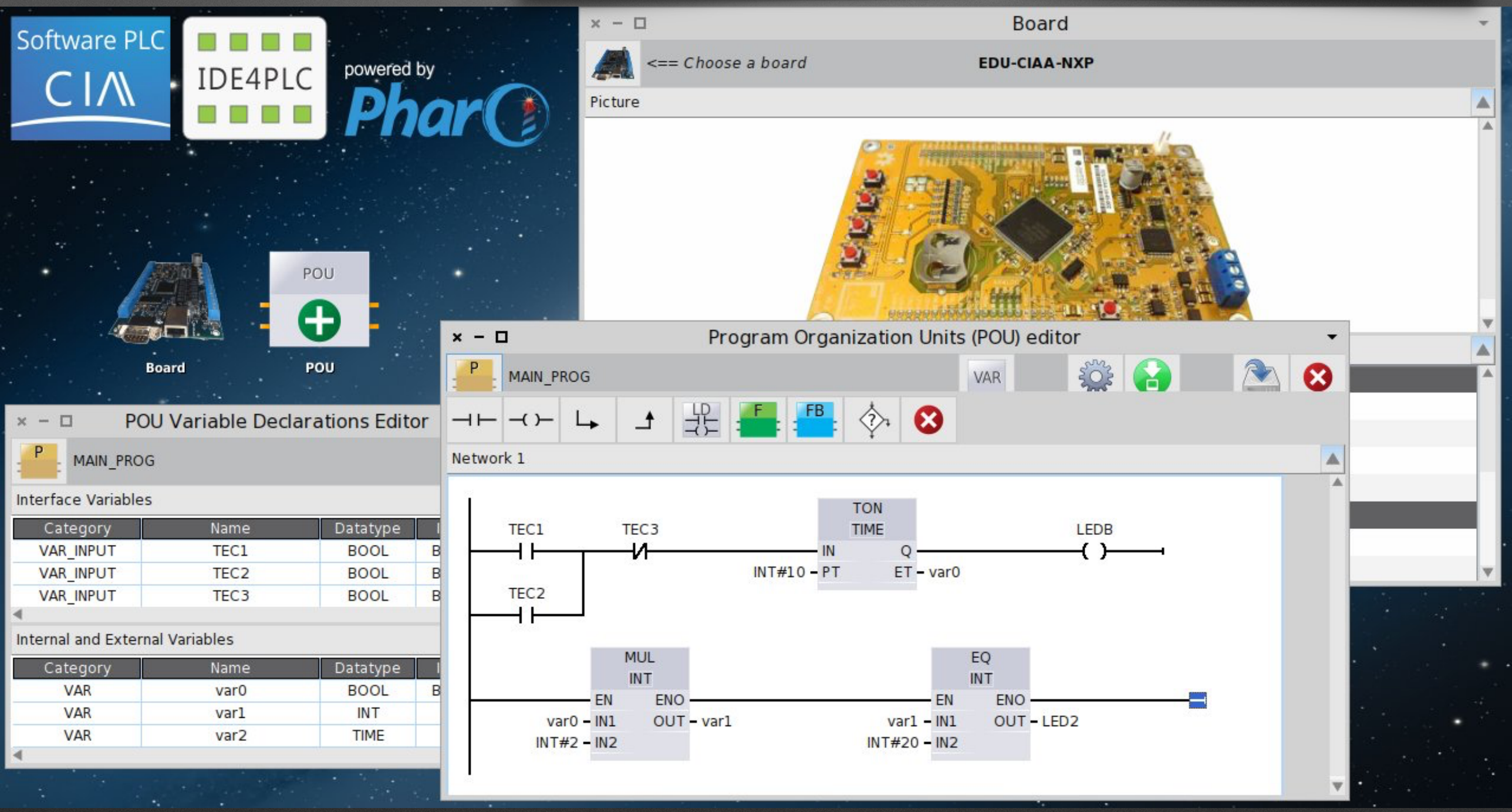
No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	6	2000	GSM S..	236	invoke forwardSM

```
▸ 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: 2905 (2905), Dst Port: 2905 (2905)
▸ MTP 3 User Adaptation Layer
▸ Signalling Connection Control Part
▸ Transaction Capabilities Application Part
▸ GSM Mobile Application
▾ GSM SMS TPDU (GSM 03.40) 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 SME
    .... 0... = TP-LP: The message has not been forwarded and is not a spawned message
    .... .1.. = TP-MMS: No more messages are waiting for the MS in this SC
    .... ..00 = TP-MTI: SMS-DELIVER (0)
  ▸ TP-Originating-Address - (4918843150 24)
  ▸ TP-PID: 0
  ▸ TP-DCS: 0
  ▸ 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 09  6b 1e 28 1c 06 07 00 11   biH..... k.(.....
0008  86 05 01 01 01 a0 11 60  0f 80 02 07 80 a1 09 06   .......` ........
0010  07 04 00 00 01 00 19 02  6c 41 a1 3f 02 01 01 02   ........ lA.?....
0018  01 2c 30 37 80 08 62 02  43 68 10 91 50 f9 84 08   ..07..b. Ch..P...
0020  91 94 51 97 10 00 08 00  04 21 24 8c 91 94 81 48   ..Q..... .!$....H
0028  13 65 42 00 00 51 10 71  21 95 53 40 10 c8 32 9b   .eB..Q.q !.S@..2.
0030  fd 06 99 e5 ef 36 00 0a  0e cb df 00               .....6.. ....
```

MobileTerminated ForwardSM

Programming environment for Programmable Logic Controllers



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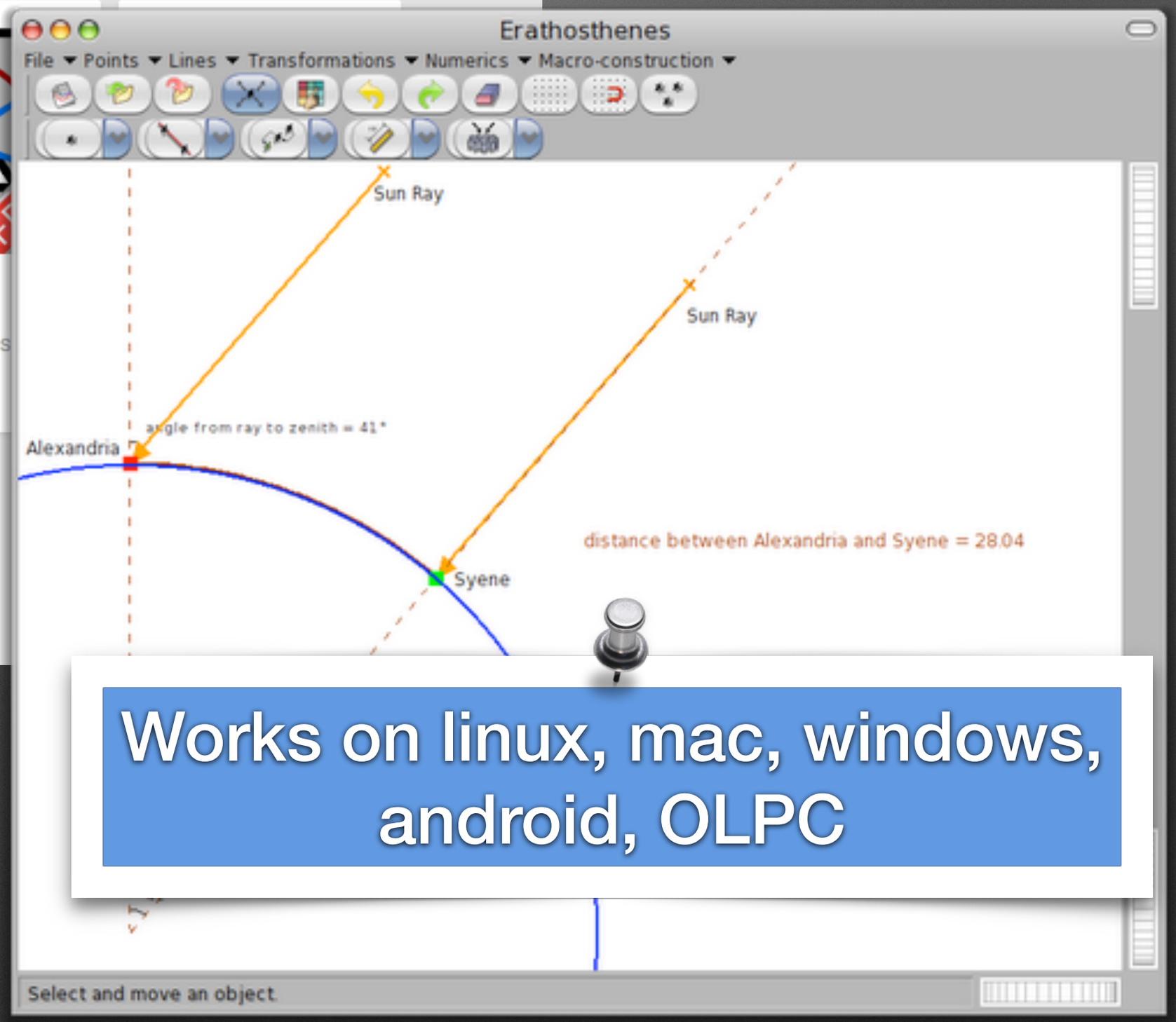

Works on linux, mac, windows, android, OLPC

Pha

a TRMorph(1058537472)

zoom

a TRMorph(43778048)

ObjectProfile
produces visualizations &
analysis tools
DSL

Left to run / Right for code

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

SpesenFuchs

Funktionen Aktuelles Forum FAQ Preise

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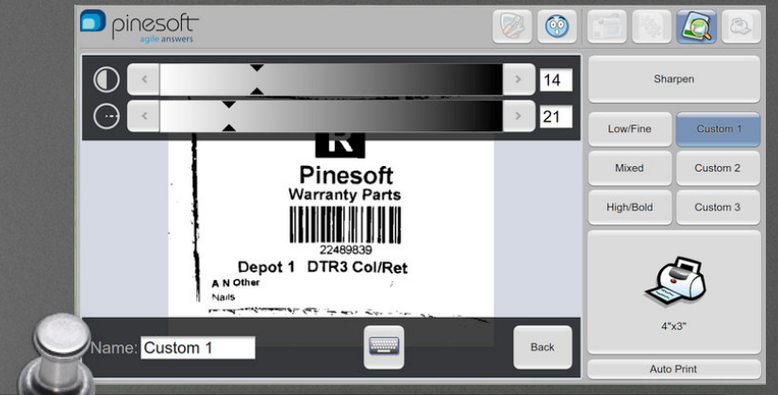
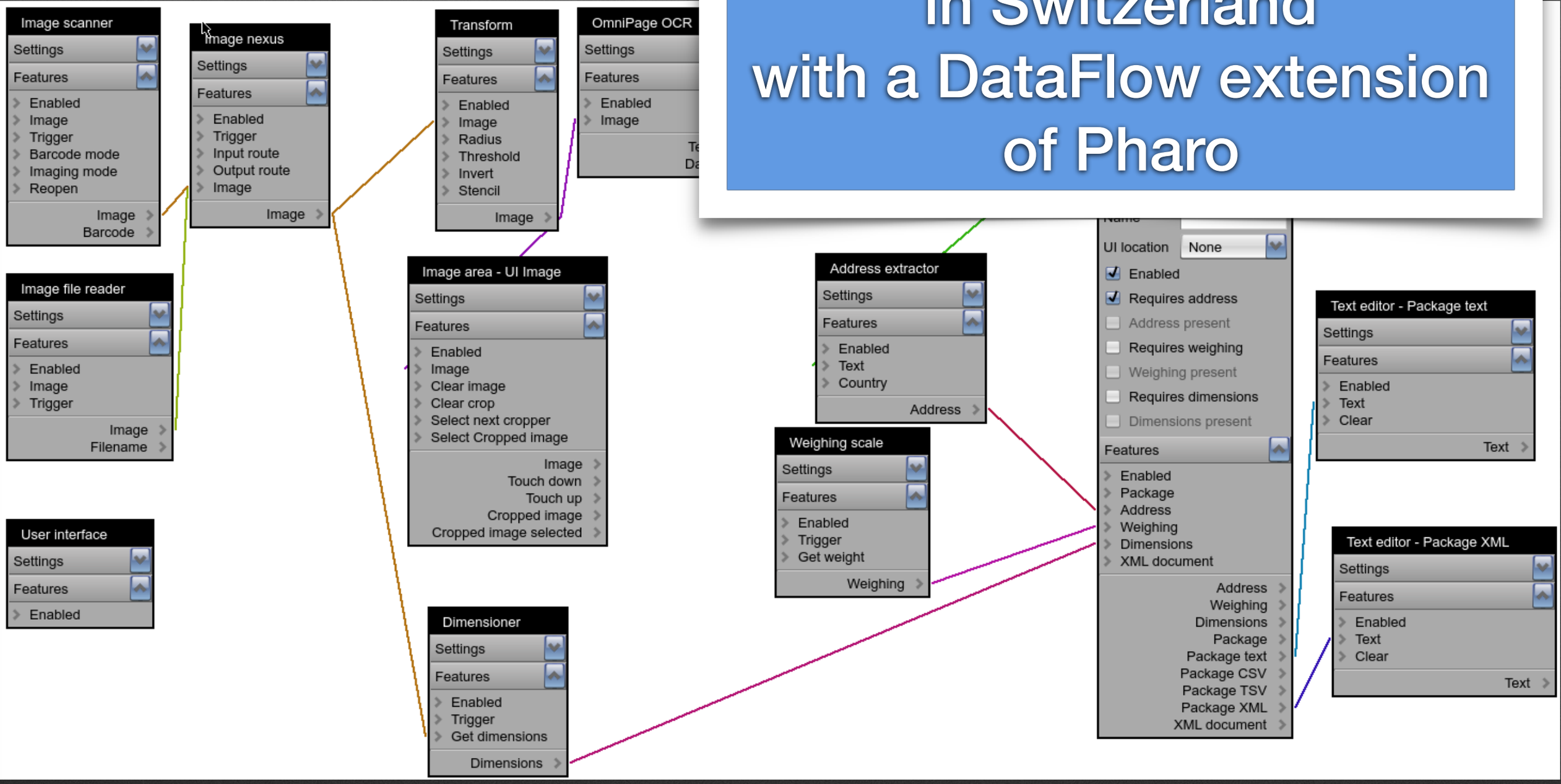


To handle return mails in Switzerland with a DataFlow extension of Pharo



A cool community

More Pharo's Teachers

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ENIT (FR)
Cochabamba (Bo)
Maroua (CAM)
ETS (CAN)

Since May 2008

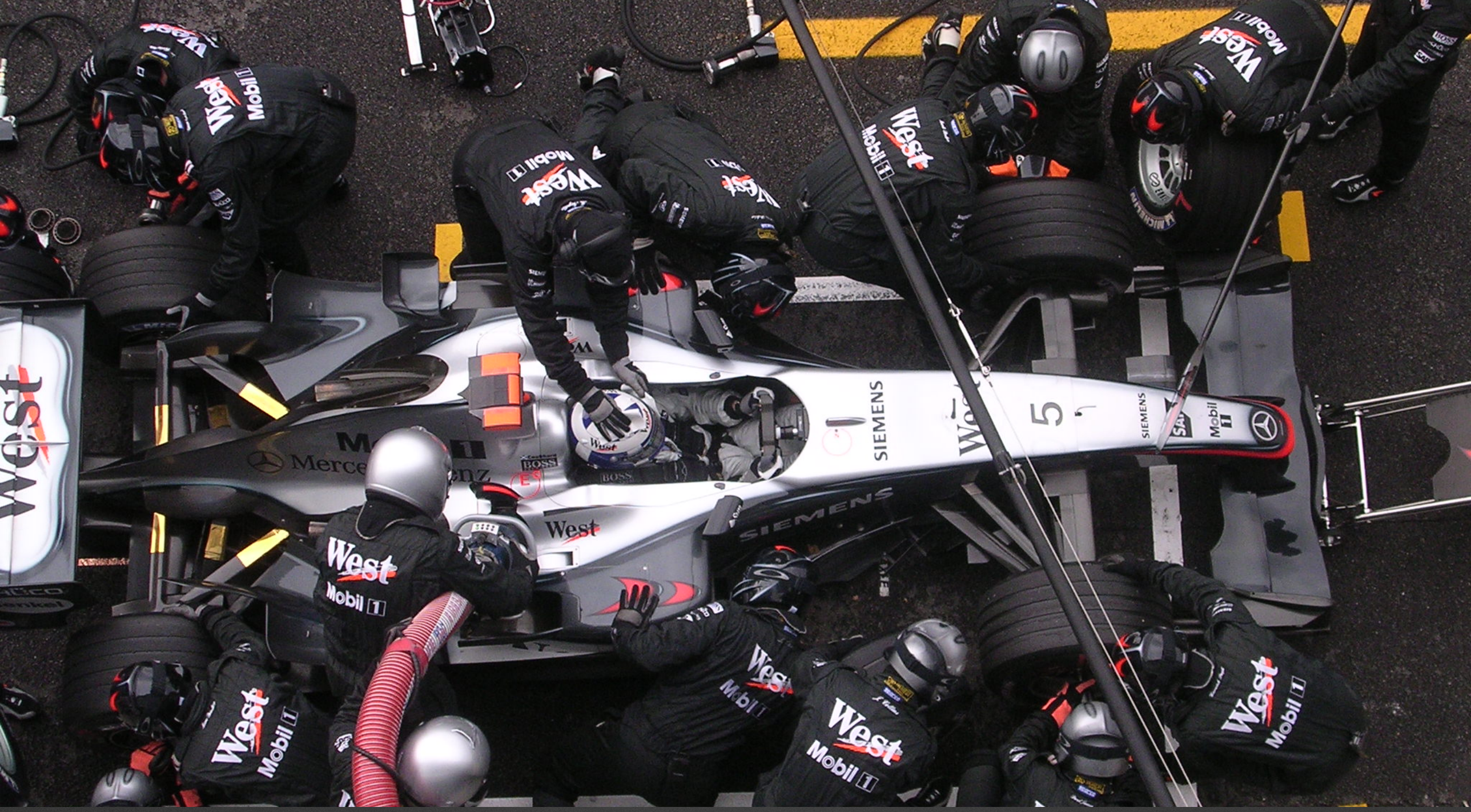
Version	Release date	Major features
	March 16, 2008 [2]	Fork of Squeak environment
Pharo 1.0	April 15, 2010	real closures, EToys and MVC removed
Pharo 1.1	July 26, 2010	Cog JIT VM, Settings framework
Pharo 1.2	March 29, 2011	new Finder, Recent changes tool, improved Help, better themes
Pharo 1.3	August 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
(~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.

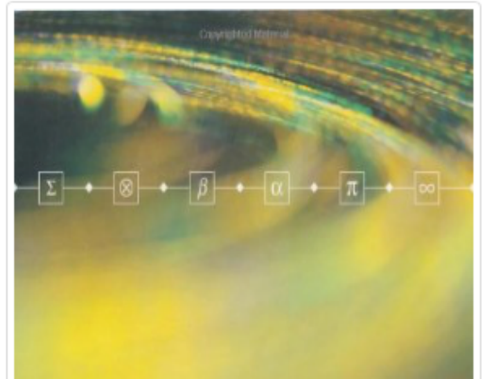
View details »

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 »

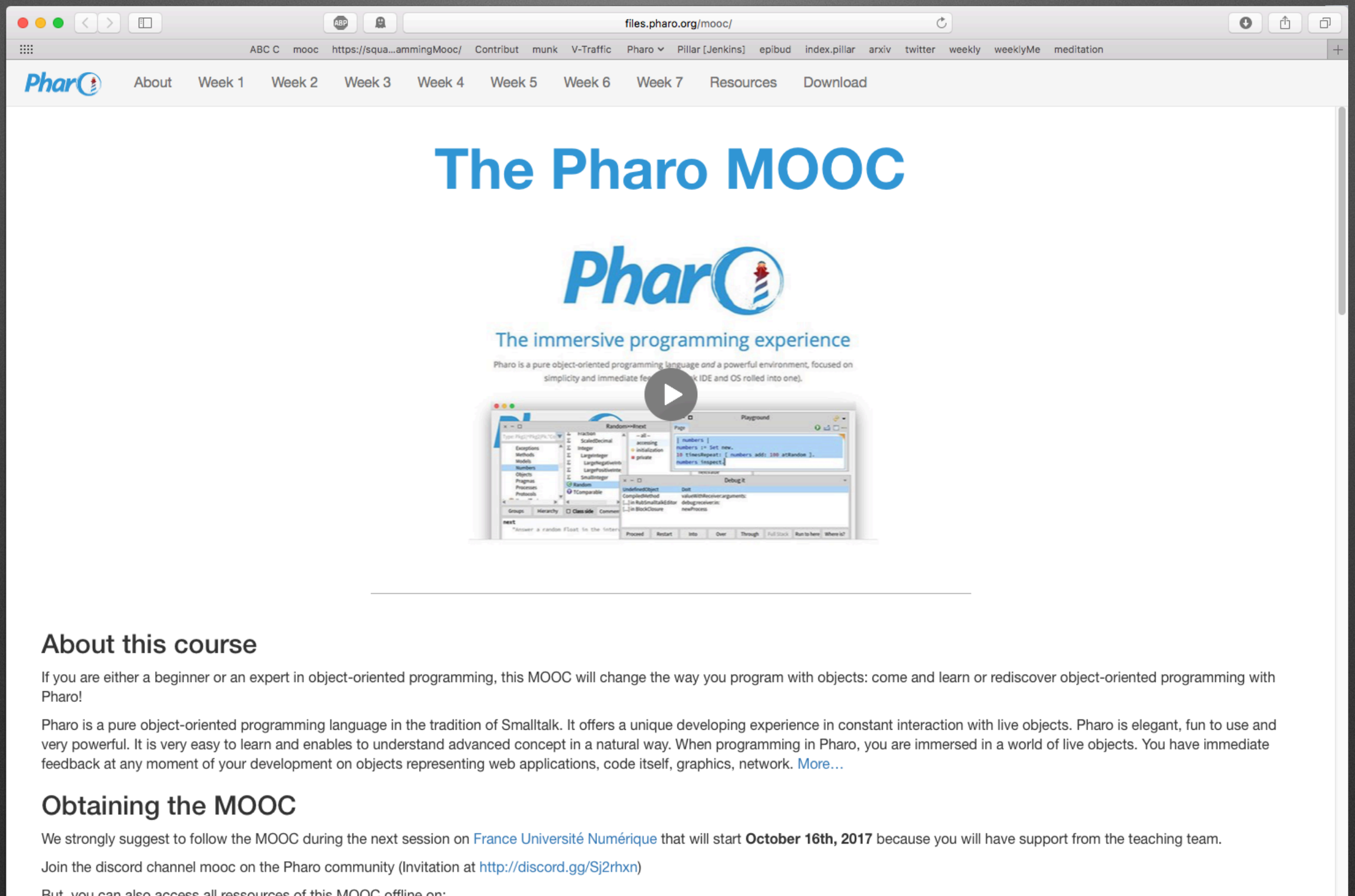
Enterprise Pharo is the third volume of the series. This book covers libraries and frameworks for enterprises, and in particular those doing web development.

View details »

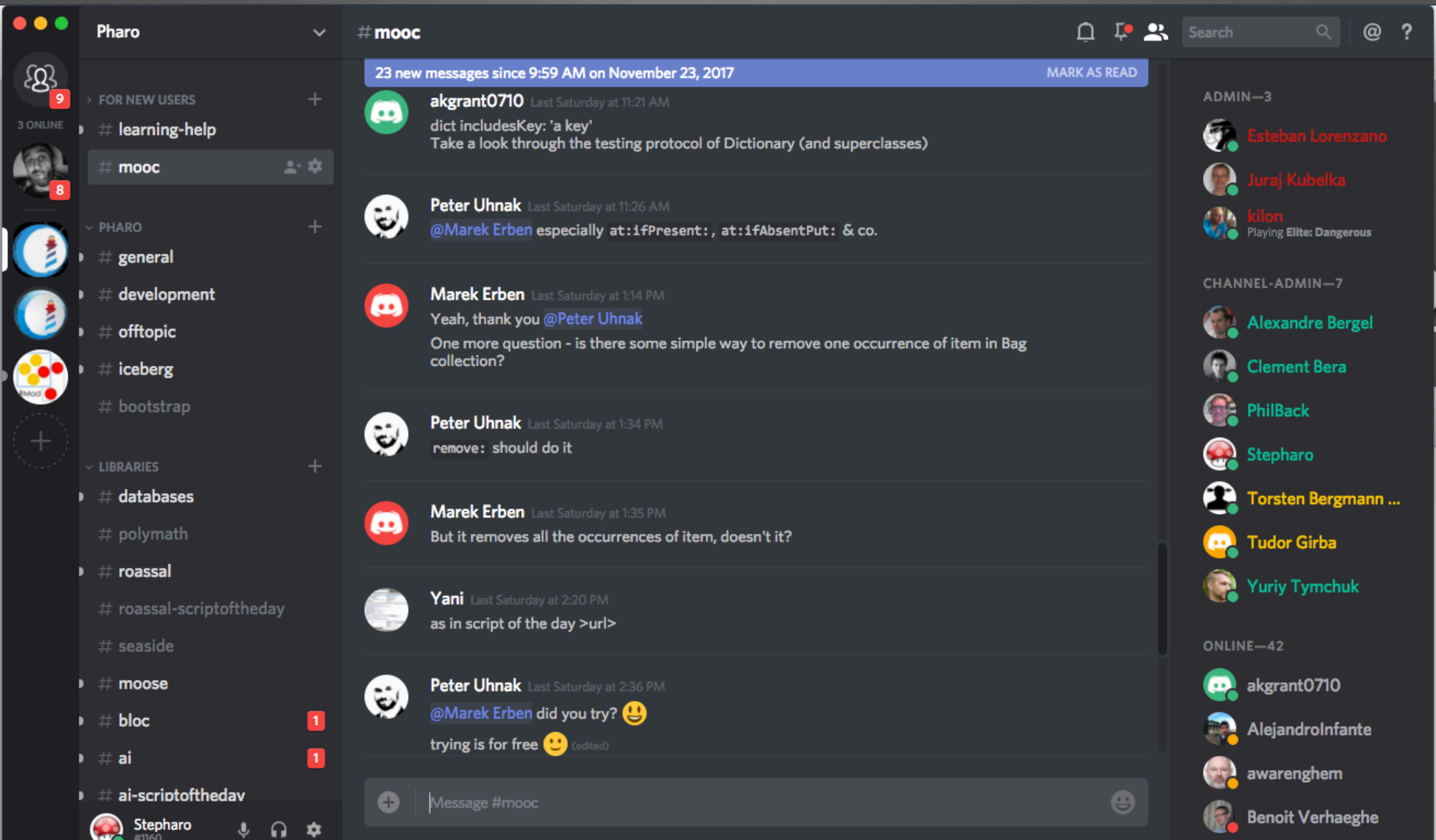


TinyBlog: Un Tutorial Web en Pharo

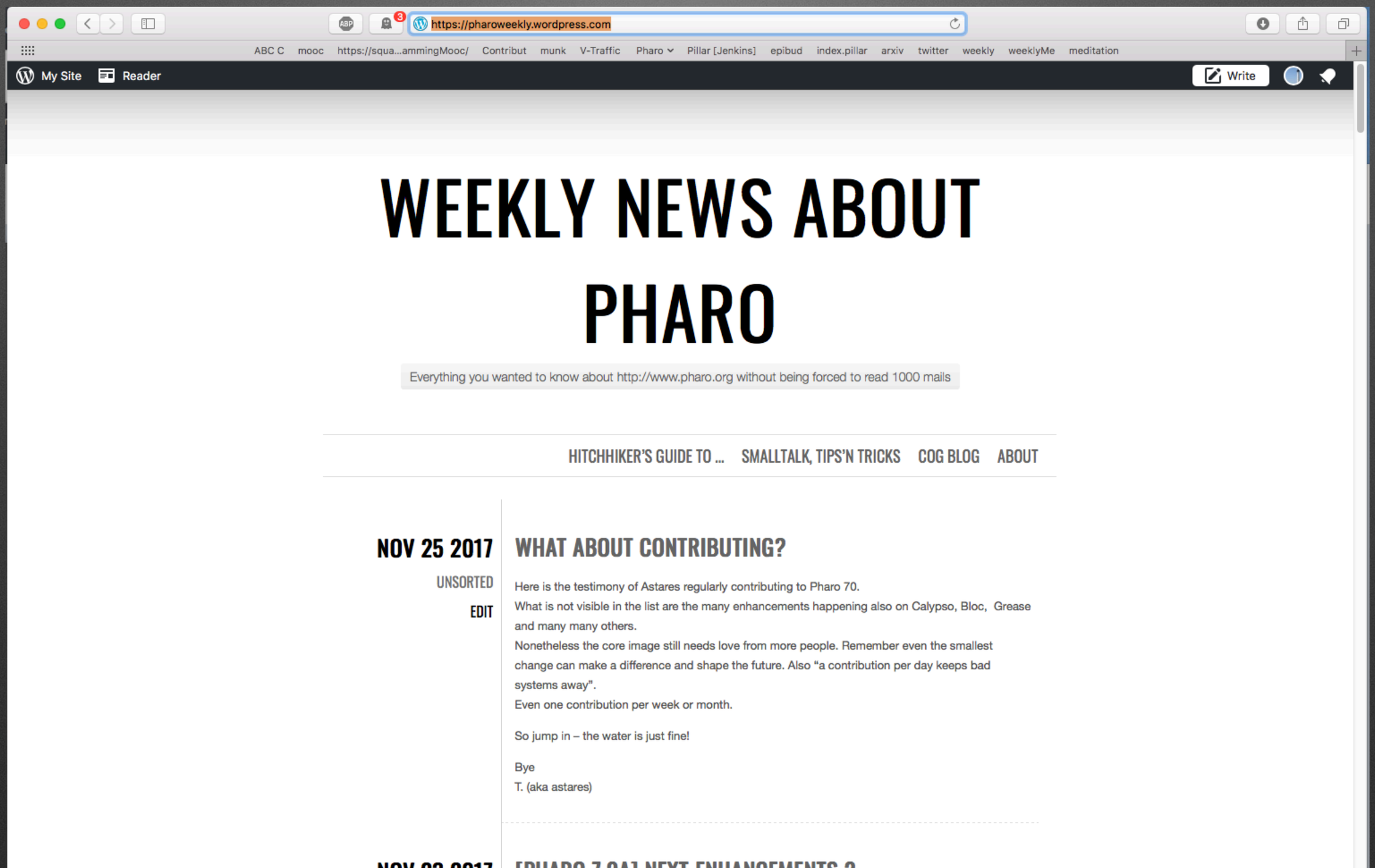
http://mooc.pharo.org



https://discord.gg/QewZMZa



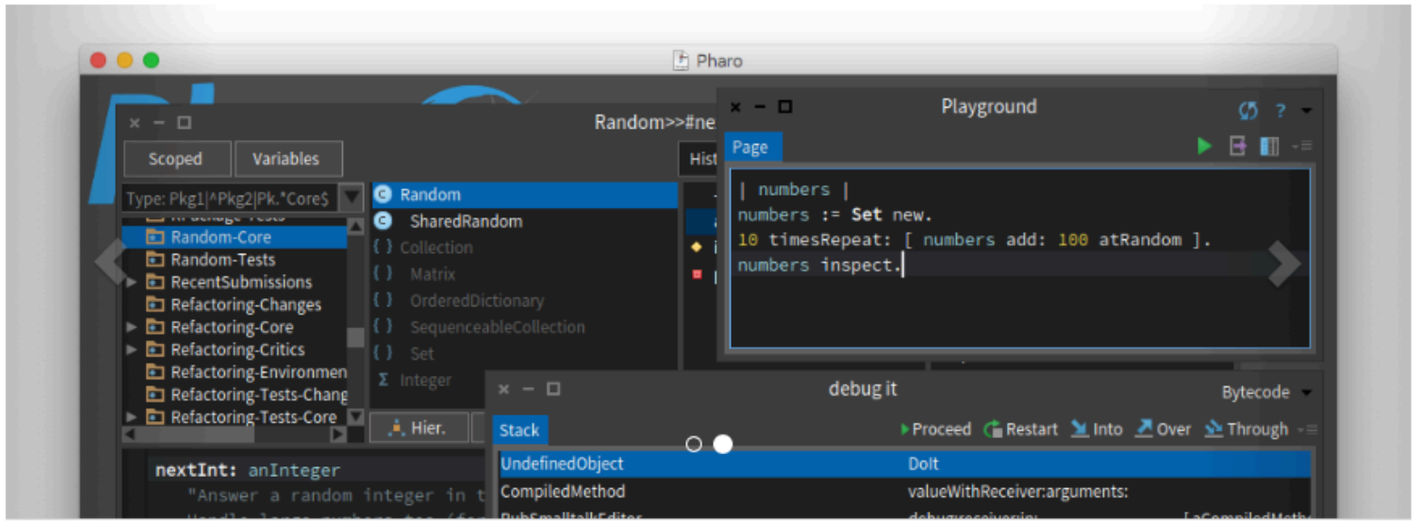
https://
pharoweekly.wordpress.com



Pharo

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

Learn more about Pharo's key features and elegant design.

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