

Pharo for Scientists

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

<http://www.pharo.org>



JPMORGAN
CHASE & Co.



feenk



projector
software

inspired!



Sensus
Systems that make sense



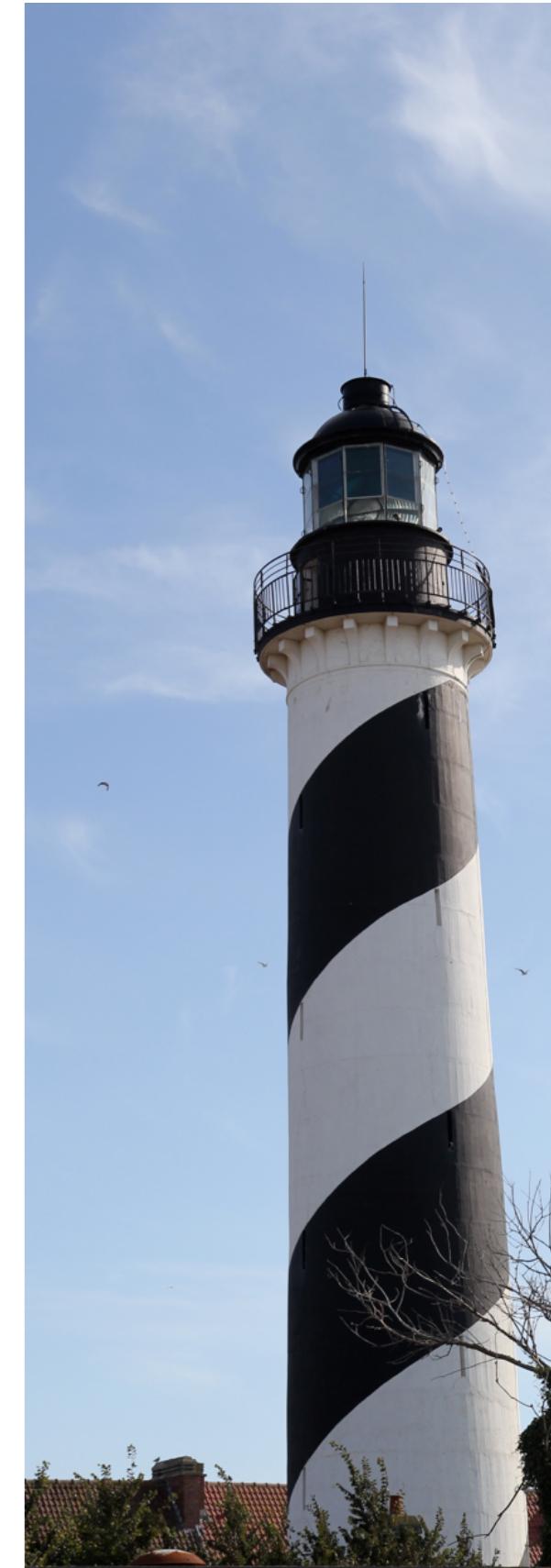
ZWEIDENKER

THALES



SORABITO

knowroaming
TA MÈRE SCRL
BADASS MOBILE DEVELOPMENT



Pharo?



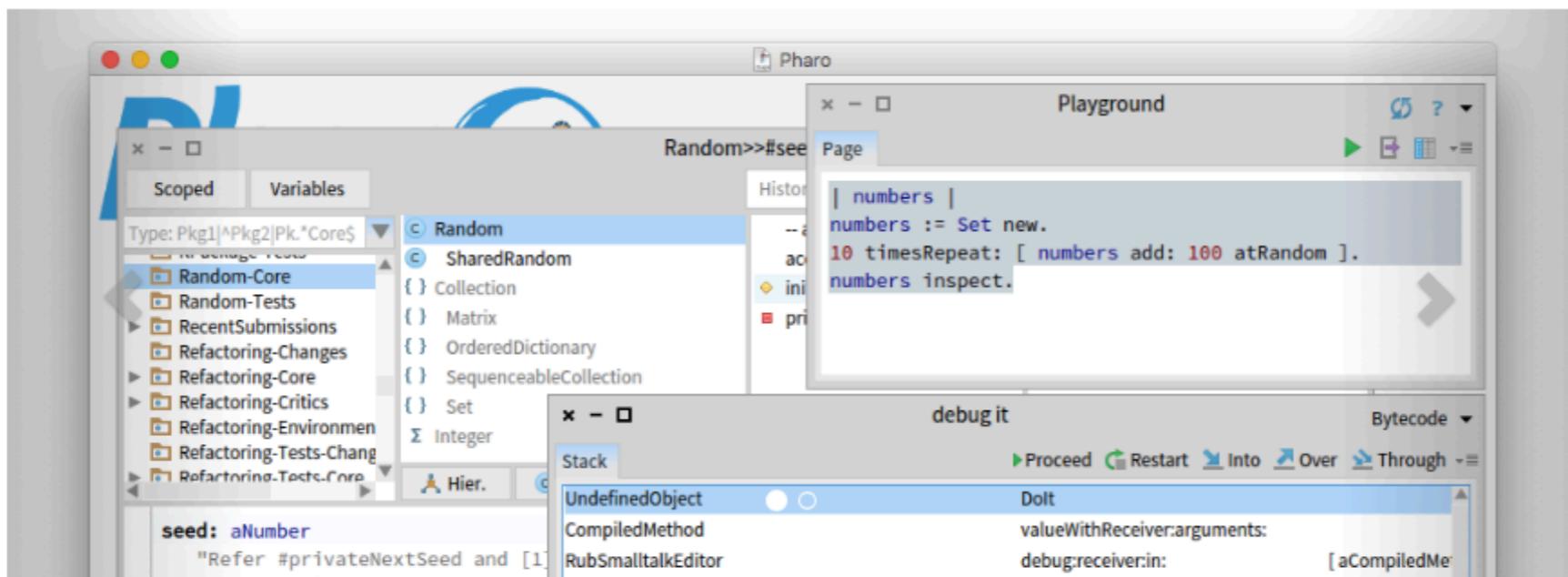
Pharo!

- System: Pure object language + full IDE
- Powerful, elegant and fun to program
- Great community / industrial consortium
- Living system under your fingers
- Works on Mac OSX, Linux, iOS, *Android*, Windows, Pi - 100% MIT



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).



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

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Pharo 90
~740 packages
- 9 000 classes
- 120 000 methods

250 forks sur Github
up to 100 contributors
30 regulars
- 8 sub projets
- graphics
- vcs
- tools

Consortium
~ 28 companies
~ 25 academic



Epicea - Code Changes

AssertionFailure: Assertion failed

Stack

```
RubSmalltalkEditor  
RubSmalltalkEditor  
GLMMorphicPharoScriptRenderer(GLMMorphicPharoScript)  
RubEditingArea(RubAbstractTextArea)  
GLMMorphicPharoScriptRenderer(GLMMorphicPharoScript)  
WorldState  
WorldMorph  
WorldState
```

Source

```
doOneCycleLoopFor: world  
    "immediately do one cycle of the interaction loop.  
    This should not be called directly, but only via #nextCycle."  
  
displayScreen checkForNextScreenToBe:  
  
"process user input events"  
LastCyclation := Time millisecondClockValue.  
self handleUserInput.  
self activateWorld.  
in processEvents.  
self activateWorld.
```

Type	Evaluator	Value
self	variable	a WorldMorph
world	variable	a WorldMorph
activation	alarm	a Map (WorldWorld)
alarm	alarm	a ChannelWorld

Pharo

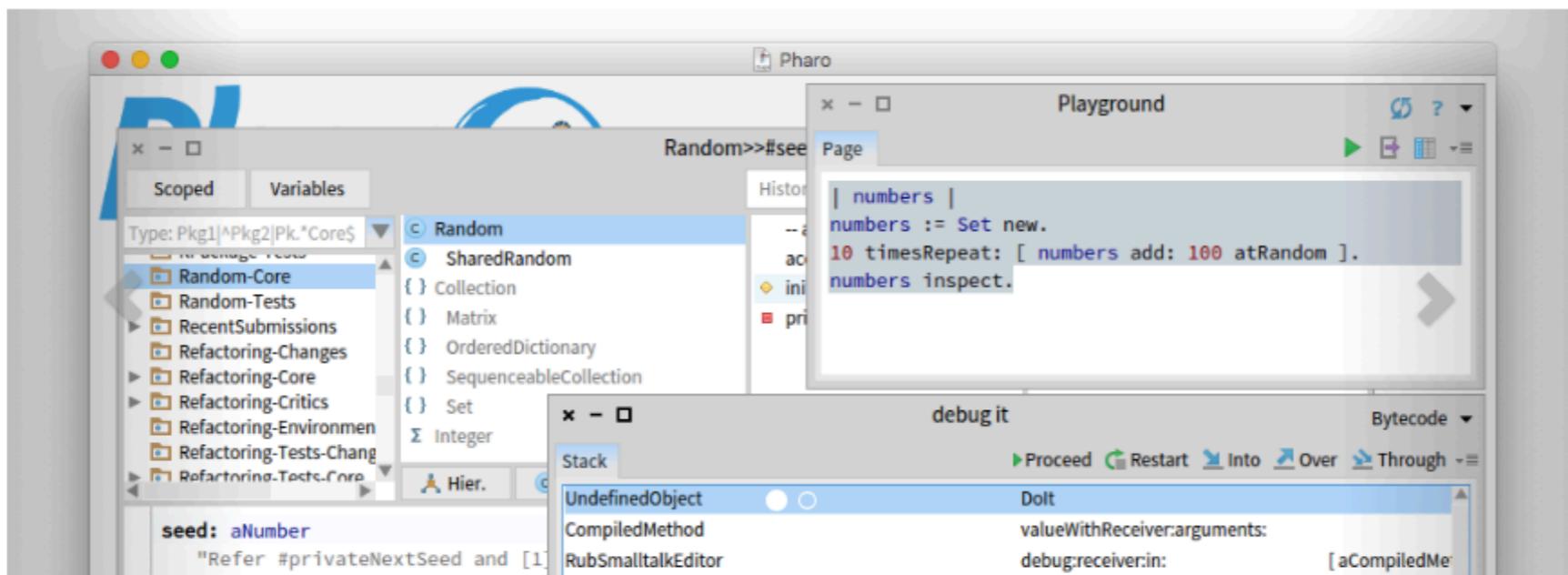
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~ 25 academic

Elegant!

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



```
method name           parameter
exampleWithNumber: x

<syntaxOn: #postcard> pragma
"A ""complete"" Pharo syntax" comment

| y | local variable
true & false not & (nil isNil) binary message
ifFalse: [ self perform: #add: with: x ]. unary message
block
y := thisContext stack size + super size.

instance variable      integer literals
byteArray := #[2 2r100 8r20 16rFF]. byte array
array generated at runtime   literal array

{ -42 . #($a #a #'I''m' 'a' 1.0 1.23e2 3.14s2 1) }
do: [ :each | symbols
               character
               string
               floating point
               scaled decimal
local block variable
               | 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

Mainly objects,
messages and lexical
closures

Temp declaration, assignment, separator and return

| a |

a := 40 + 2.

^ a

Messages

Unary messages

Date today, 9 squared

“Operators” Binary

4 + 3

‘Black’, ‘Chocolate’, ‘is good’

Keywords messages

2 between: 0 and: 10

2.betweenAnd(0, 10)

Lexical closures: Blocks

- closure definition

`[:x | x + 5]`

- closure execution

`[:x | x + 5]` value: 37

> 42

Control flow ops are messages

Weather today isRaining

ifTrue: [self takeUmbrella]

ifFalse: [self takeSunglasses]

Yes we send messages to Boolean objects

Iterators

```
#( 1 -2 -3 4 -5) collect: [:each | each abs]
```

```
> #( 1 2 3 4 5)
```

Yes we send messages to collection to do loops

Class definition

```
Object << #Point  
slots: { #x . #y };  
package: 'Kernel'
```

Class definition (old)

Object subclass: #Point

instanceVariableNames: 'x y '

classVariableNamed: ''

package: 'Kernel'

Method definition

`<= aPoint`

"Answer whether the receiver is neither below nor to the right of aPoint."

`^ x <= aPoint x and: [y <= aPoint y]`

Full Model!

- * Dynamically typed
- * Everything is an instance of a class
- * All methods are public virtual
- * All attributes are protected
- * Single inheritance
- * Stateful Traits
- * Closures everywhere



* H Ö R N U

Leuchttürme

For the advanced

- * Classes are objects
- * Instance variables are first class with meta object protocol
- * Stack can be reified on demand
- * AST can be fully annotated and transformed on the fly during execution



* H Ö R N U

Focus on intrinsic complexity

**Eliminate accidental
complexity**

A grayscale photograph of a person's hand holding a red pencil, writing on a piece of paper. Another hand is visible below, holding a black pencil and drawing a wavy line across the paper.

Fully Written in Itself

**Everything is written in Pharo
One simple syntax to rule
them all**

Learn
Adapt
Modify

Pharo is highly
immersive

**Most languages do not
expose much of their
internals**

Looking inside

- * Introspection is a first step
- * Pharo is fully inspectable and reflective

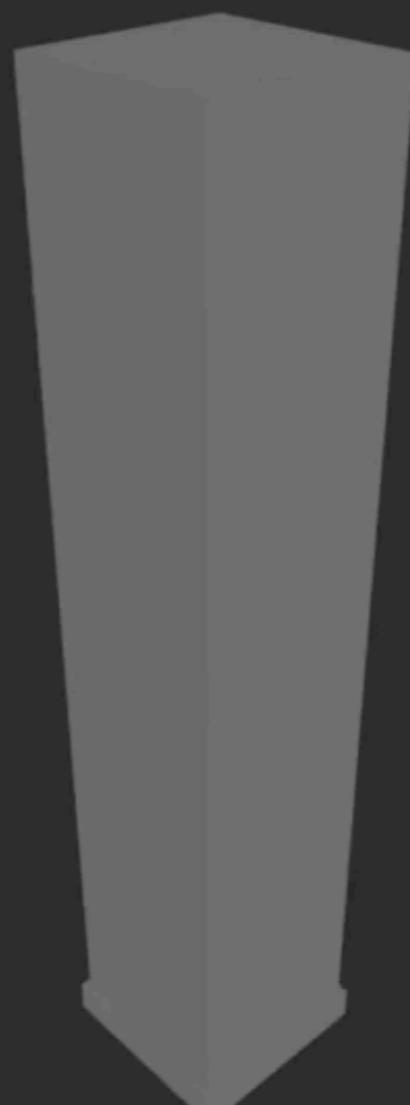
Immersed and interacting

- * You interact with objects
- * You modify objects life

Workspace

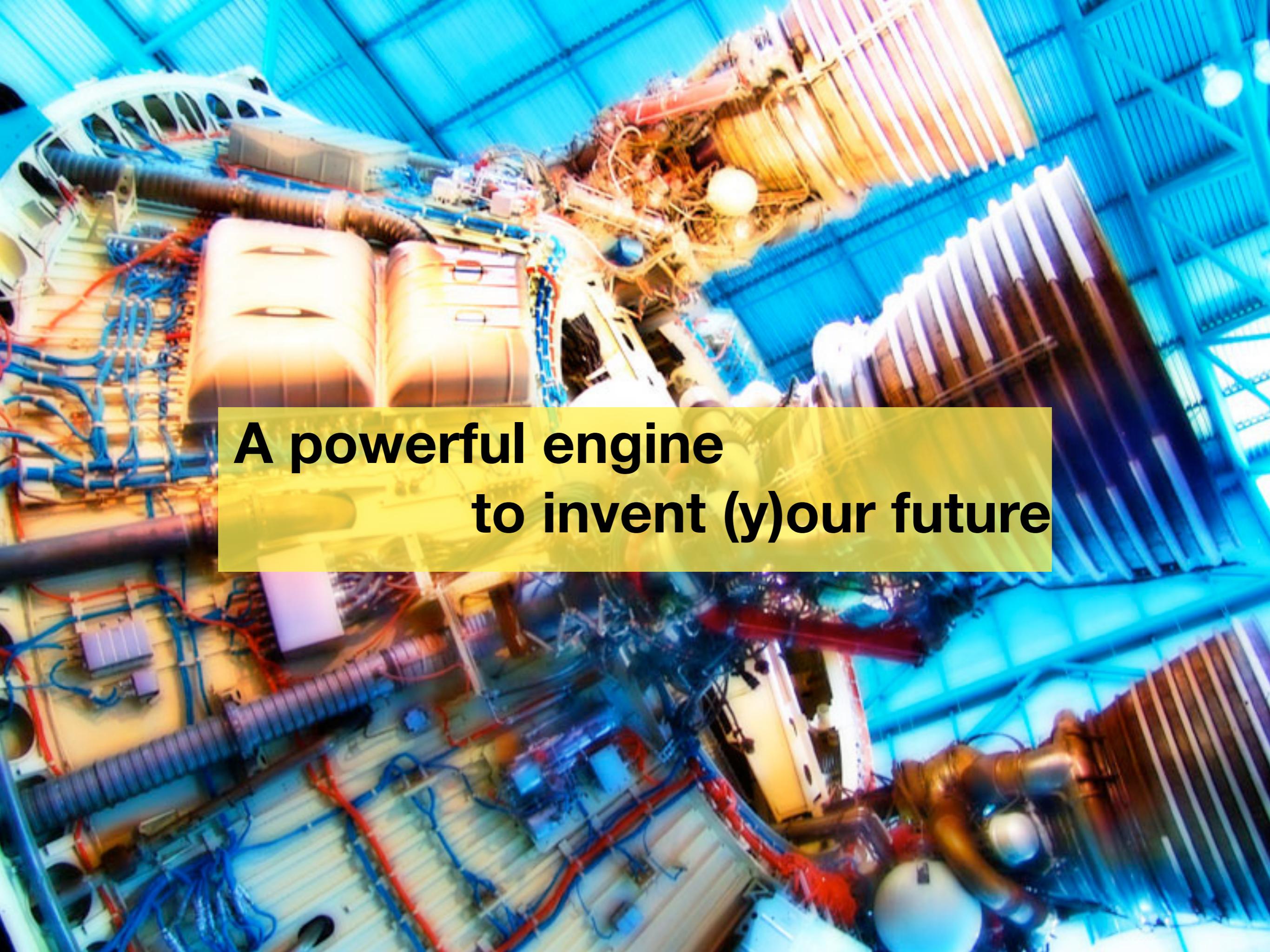
```
| elements lay |  
  
elements := (1 to: 5) collect: [ :ob |  
  (R3CubeShape new) elementOn: ob ].  
  
lay := R3WallLayout new.  
lay on: elements.  
  
UberPresenter present: elements
```

Uber Presenter



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

Pharo's goal...

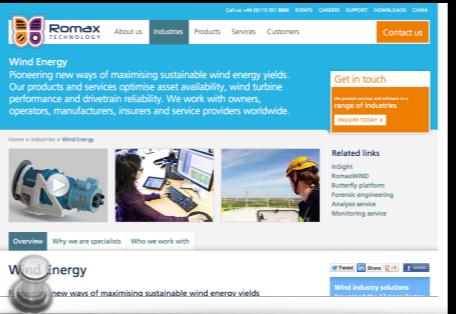
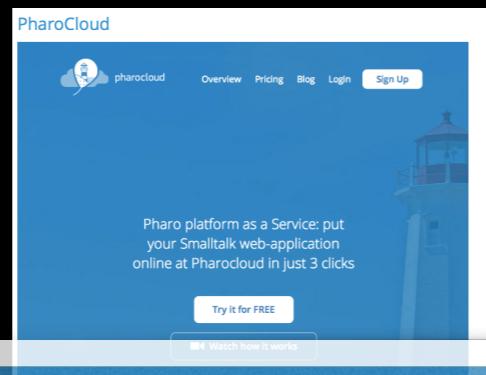


**A powerful engine
to invent (y)our future**



**An ecosystem where
innovation/business bloom**

Some Success Stories



WEBDRUCK.CH Web-To-Print Solution

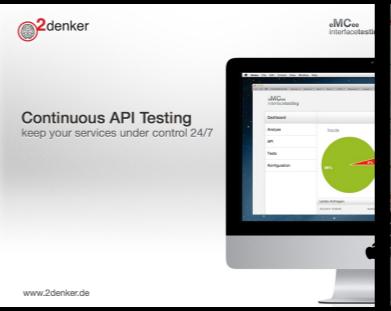
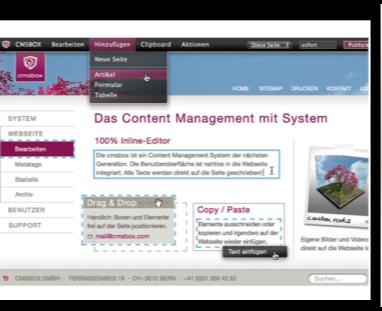
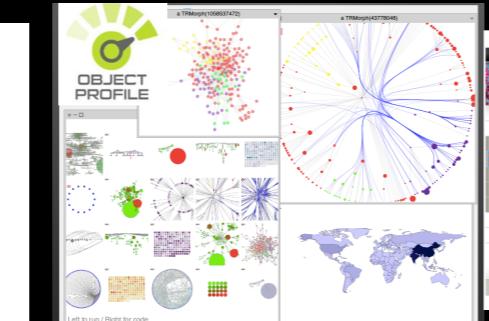
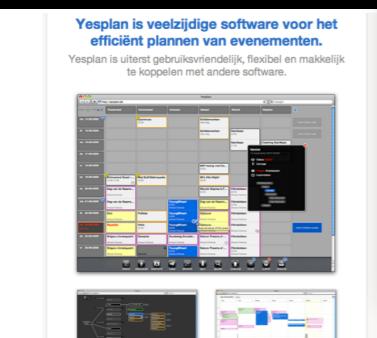
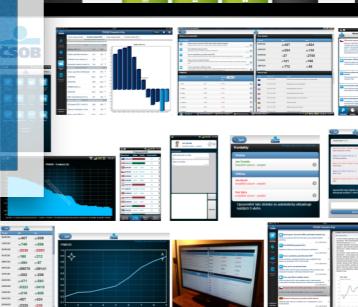
- Design and create individual printed matter
- eShop with credit card payment
- High quality PDF output with Printing Process integration
- Thousands of orders for seven Swiss printing companies



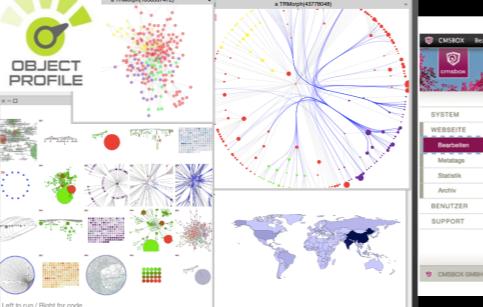
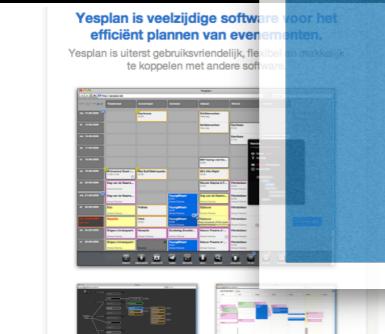
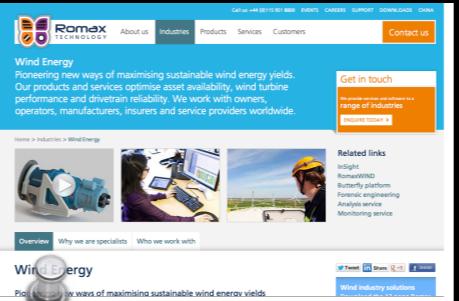
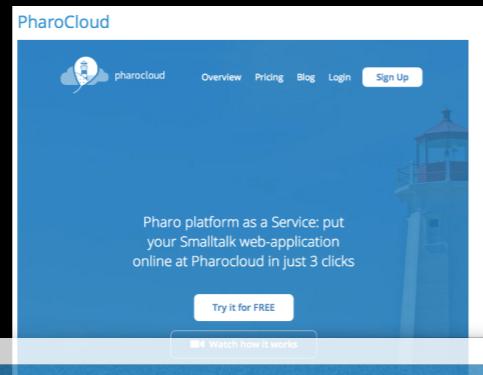
Dedicated and cost-effective tools for software evolution

Dedicated tools
Systech offers business intelligence tools for your software analysis needs

Decision making
Systech tools provide answers that lead to concrete decisions



Check <http://pharo.org/> success



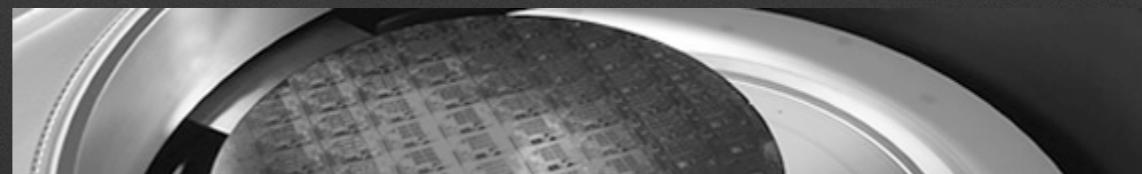
LAMRC

Back-End Wafer-Level Packaging



50% microprocessors
of your mobile/PC/tablet

Your mobile hardware as
a *high-chance* to have
been produced by a robot
controlled via a smalltalk

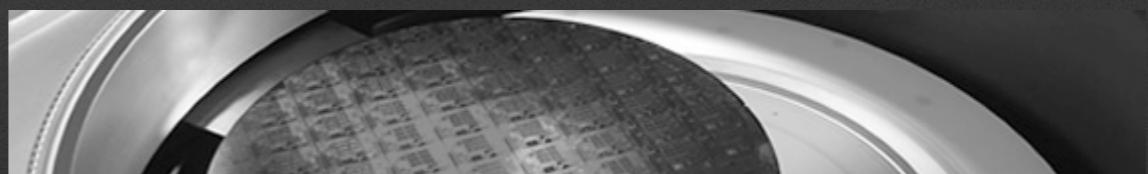


LAMRC

Back-End Wafer-Level Packaging

Started to experiment
with Pharo

Your mobile hardware as
a high-chance to have
been produced by a robot
controlled via a smalltalk



LifeWare



800

thousand

policies currently managed by our solution

25

€ billion

assets under management

15

satisfied customers

90

thousand

page per views per day

130

thousand

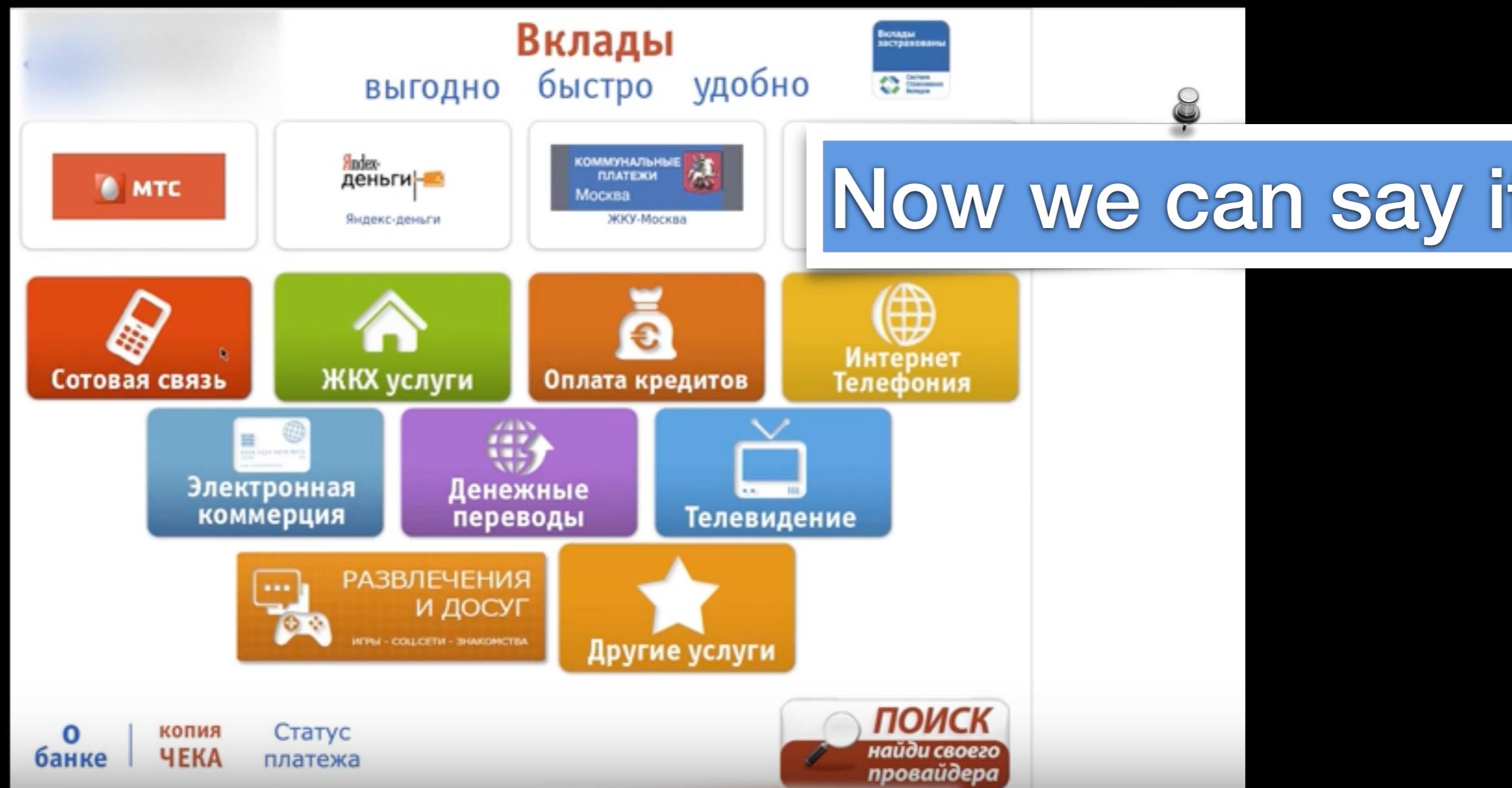
authorized users

Migrating to
Pharo

30 Millions lines of code...

Kent Beck is one of the
founders

Pharo in ATM like Device in Moscow



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Find Machines

Q Search by Category

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Cranes	Rollers	Graders	Finishers	
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Material Handling

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Farm Machinery

Tractors

Vehicles

Dumps	Trucks	Other Vehicles

Others

Attachments	Parts	Others

Q Search by Keyword

Enter a keyword (e.g. KOMATSU PC200)

Search

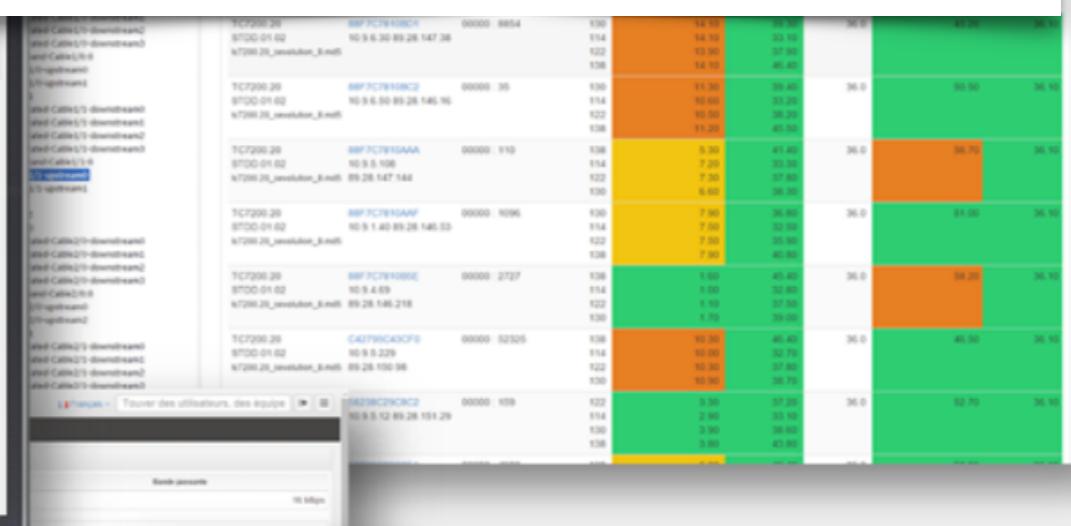
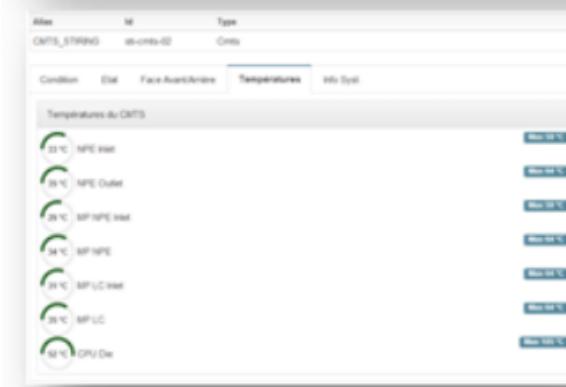
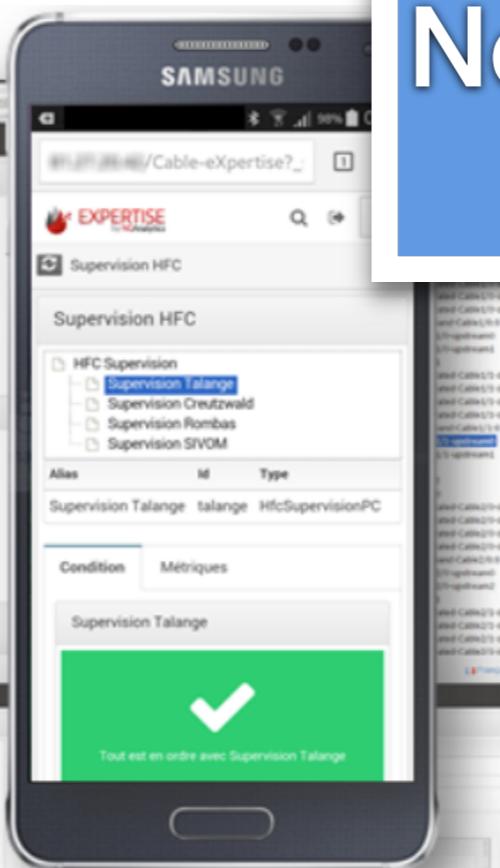
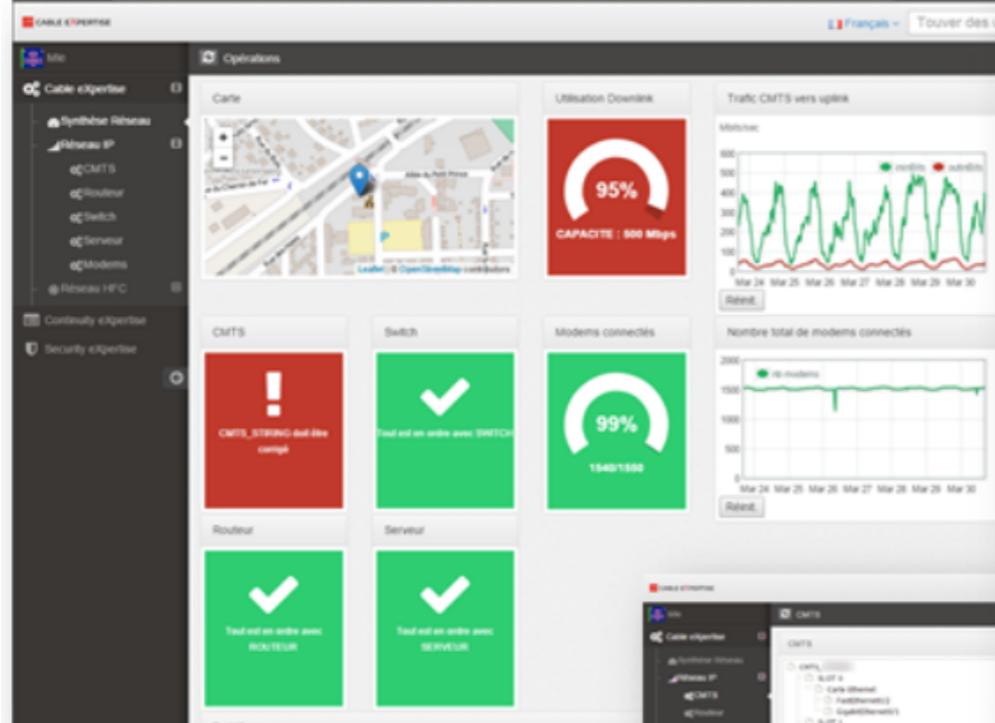
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Full Stack in
Pharo
Online
marketplace
raised 4.7 M\$

Network Monitoring for small ISPs





pharocloud

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SYSTEM

WEBSEITE

Bearbeiten Metatags Statistik Archiv

BENUTZER

SUPPORT

CMS with full history

Das Content Ma

100% Inline-Editor

Die cmsbox ist ein Content Management System der nächsten Generation. Die Benutzeroberfläche ist nahtlos in die Webseite integriert: Alle Texte werden direkt auf die Seite geschrieben! 

Drag & Drop 

Handlich: Boxen und Elemente frei auf der Seite positionieren.

 mail@cmsbox.com

Copy / Paste

Elemente ausschneiden oder kopieren und irgendwo auf der Webseite wieder einfügen.

Text einfügen 

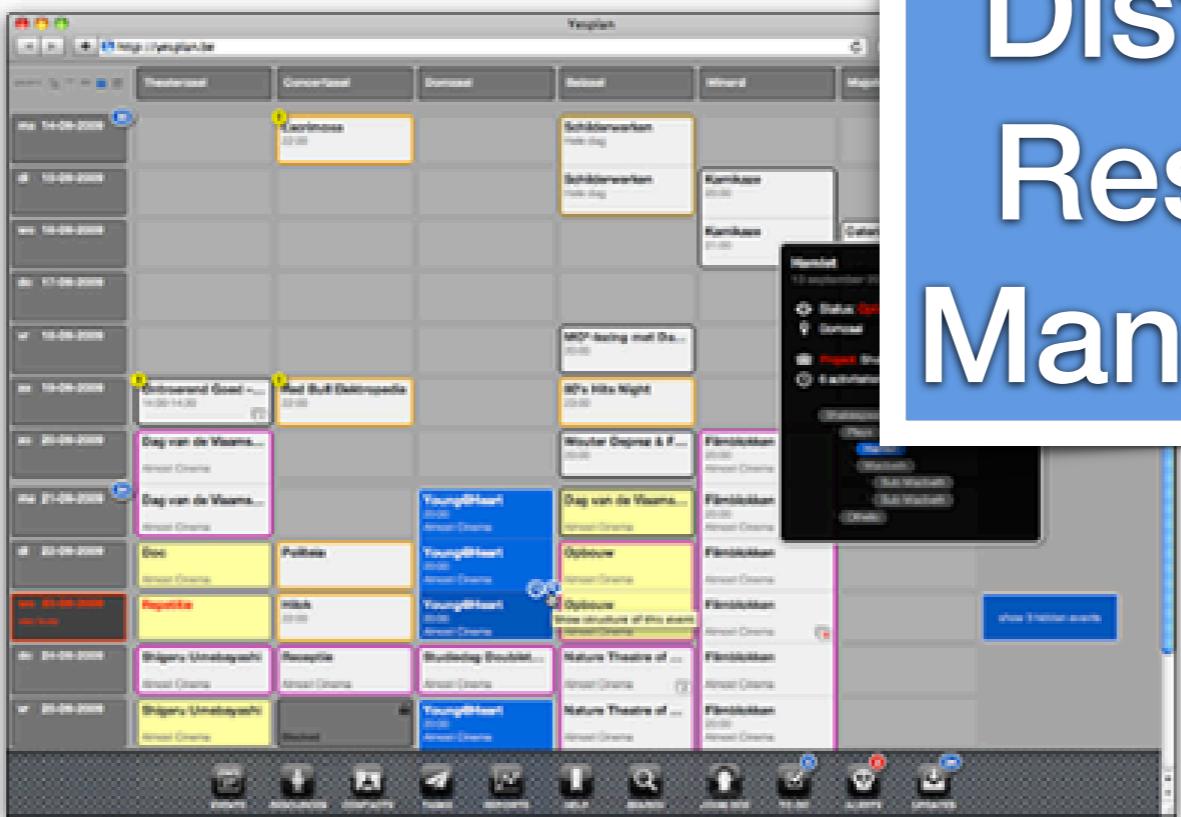

cmsbox rocks

Eigene Bilder und Videos direkt auf die Webseite la

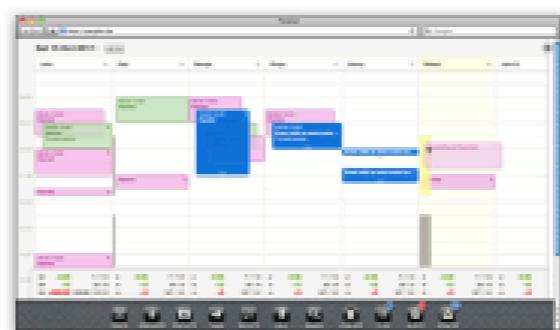
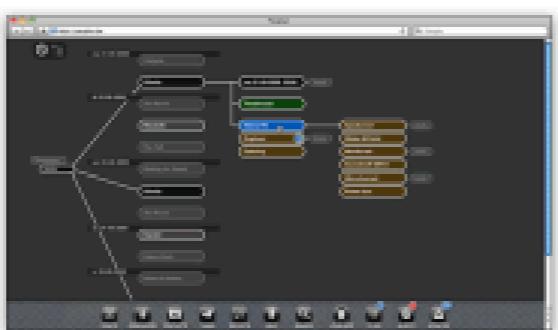
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Yesplan is uiterst gebruiksvriendelijk, flexibel en makkelijk te koppelen met andere software.



Distributed Resources Management





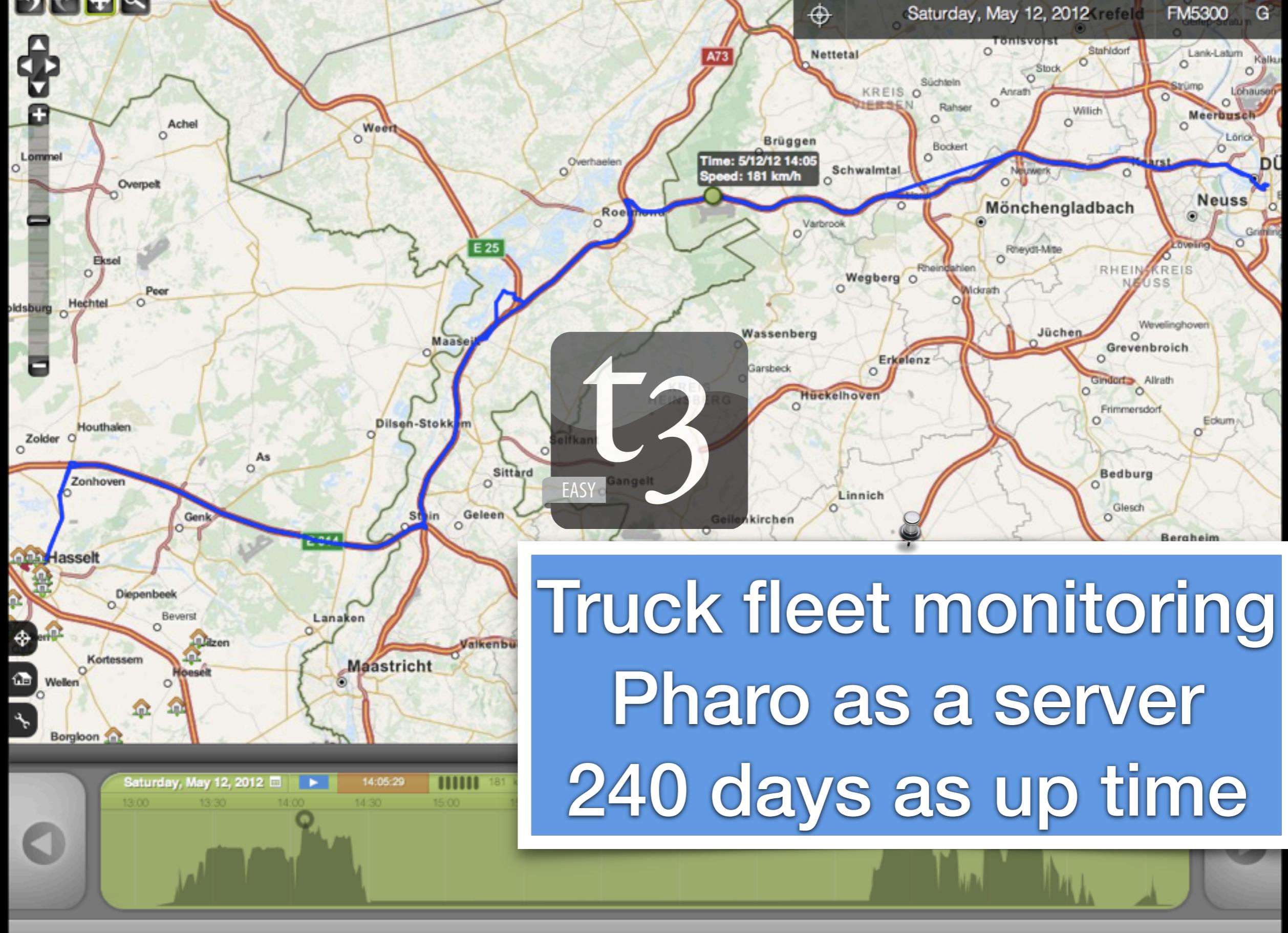
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Server Testing

Continuous API Testing
keep your services under control 24/7



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Truck fleet monitoring
Pharo as a server
240 days as up time

WEBDRUCK.CH

Web-To-Print Solution

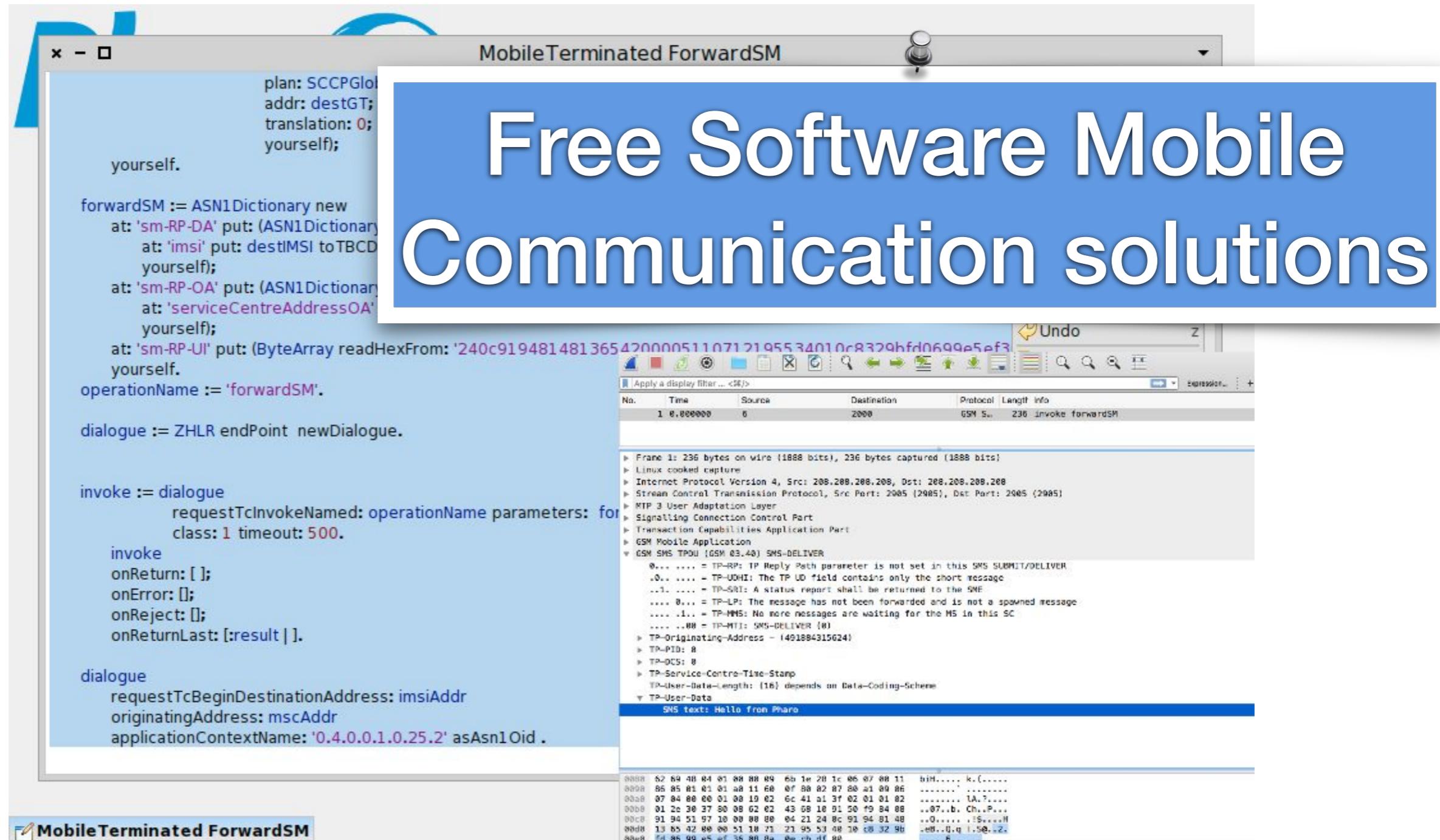
- Design and create individual printed matter
- eShop with credit card payment
- High quality PDF output with Printing Process integration
- Thousands of orders for seven Swiss printing companies



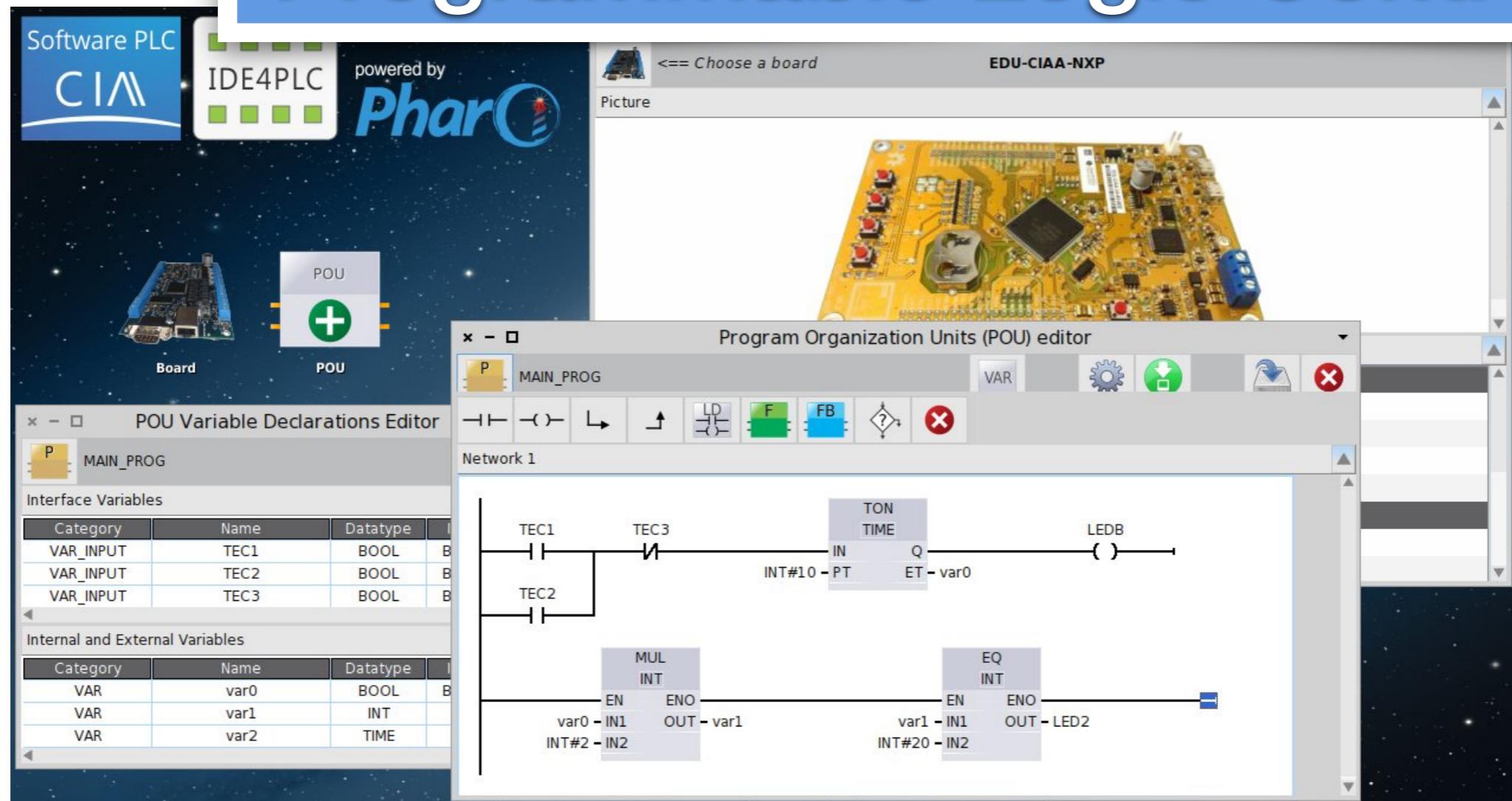
All reports are automatically generated

Quuve: Investment Portfolio

<http://debrispublishing.com>



Programming environment for Programmable Logic Controllers





NTed: disaster scenario recovery

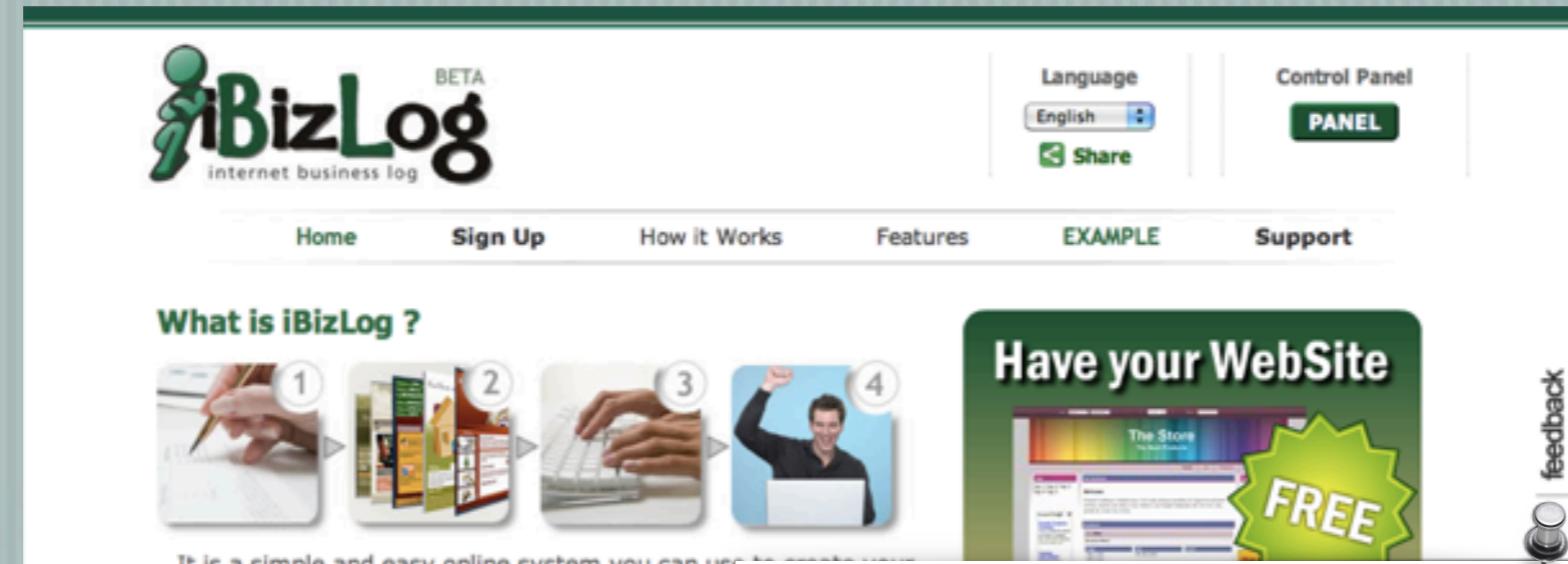
NTed

Darsteller					
Darsteller	Verletzungsmuster	Interaktionsschema	tags	PIN	
Patient 1	Inhalationstrauma	Inhalationstrauma	SK I	EEGB	
Patient 2	Verbrennungen 3. Grad	Verbrennungen 3. Grad	SK I	0MTH	
Patient 3	Verbrennungen 3. Grad	Verbrennungen 3. Grad	SK I	VYW6	
Patient 4	Offener Oberschenkel#	Offener Oberschenkel#	SK I	Z19K	
Patient 5	KoplaWu + SHT 1°	KoplaWu + SHT 1°	SK II	G7DE	
Patient 6	Verbrennungen 2°	Verbrennungen 2°	SK II	WM4G	

To simulate disaster response

Patient 11	Betroffener	Betroffener	SK III	W5UR	
------------	-------------	-------------	--------	------	--

iBizLog - <http://www.ibizlog.com>



Full system developed
in 5 months one developer
(discontinued)

A product by [Simpliworks](#)

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drgeo

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Apps

Dr. Geo free
Hilaire Fernandes & Dimi

FREE

Dr. Geo
Hilaire Fernandes & Dimi

AR\$28.70

Eratosthenes

Sun Ray

Sun Ray

Alexandria

angle from ray to zenith = 41°

distance between Alexandria and Syene = 2804

Select and move an object.

Works on linux, mac, windows, android, OLPC

Moose technology: Home

www.moosetechnology.org

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Moose is a platform for software and data analysis.

It is an open source project since 1996. It is supported by several research groups around the world, and it is increasingly adopted in industrial projects.

Download 4.7

Call for help: webpage redesign
29 April 2013
We are starting a project to redesign the Moose webpage. The initial goals of the redesign are: * ...

Moose 5.0 roadmap
13 April 2013
A summary of the talk laying out the Moose 5.0 roadmap can be found at: <http://www.humane-assessment...>

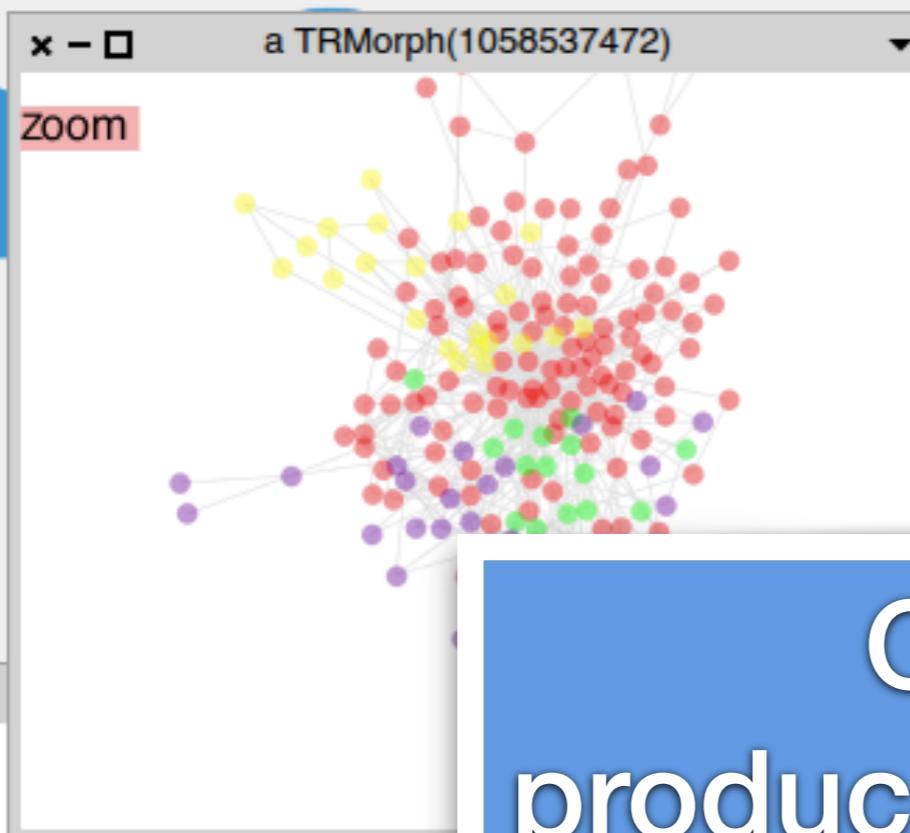
Moose 4.8 development: 4045 green tests

Moose → enables → Humane assessment

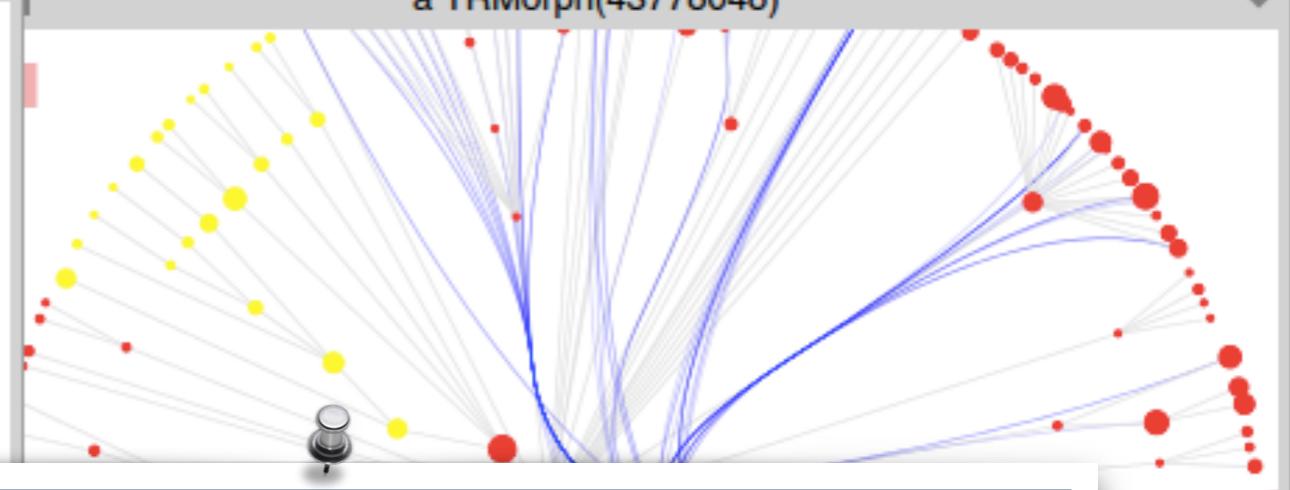
Sophisticated analysis platform more than 200 men/years

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Report an issue
Site powered by Pier

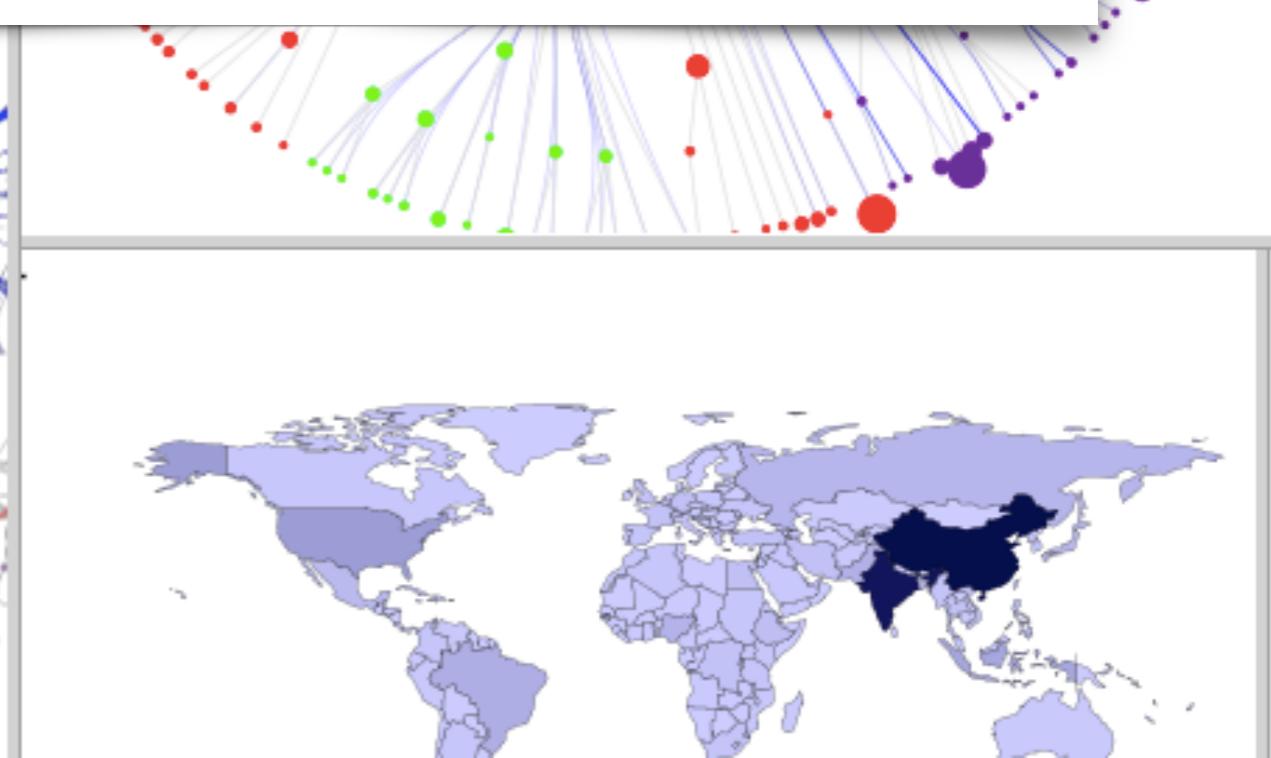
Pha



a TRMorph(43778048)



ObjectProfile
produces visualizations &
analysis tools



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 Reporting Monitor the progress using the Risk	 Export Export your test plan to a docx file	 Business Intelligence Discover intelligence in your testing	▶ LEARN MORE

Digitalizing business





Home

Why web-based software?

Plans and Pricing

english português español



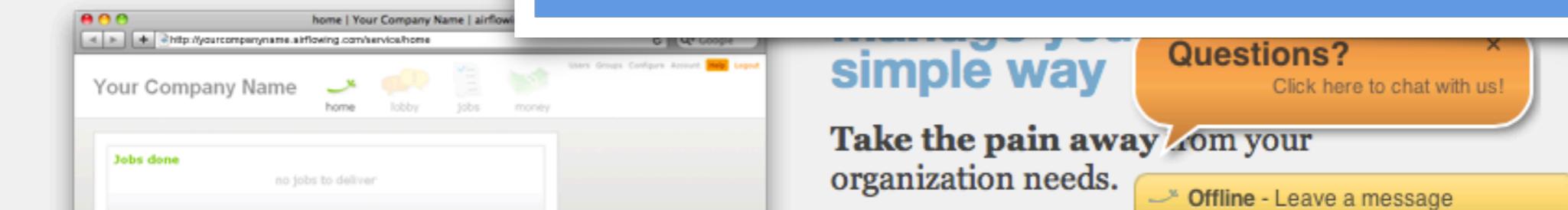
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Deployed business model did not work





Can develop a complex analysis in 3 months

tools for software evolution



Dedicated Analyses

Synectique offers business intelligence tools for your



Dedicated tools

Synectique offers tools fine-tuned to your software analysis needs



Decision making

Synectique tools provide answers that lead to concrete decisions

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Wind Energy

Pioneering new ways of maximising sustainable wind energy yields

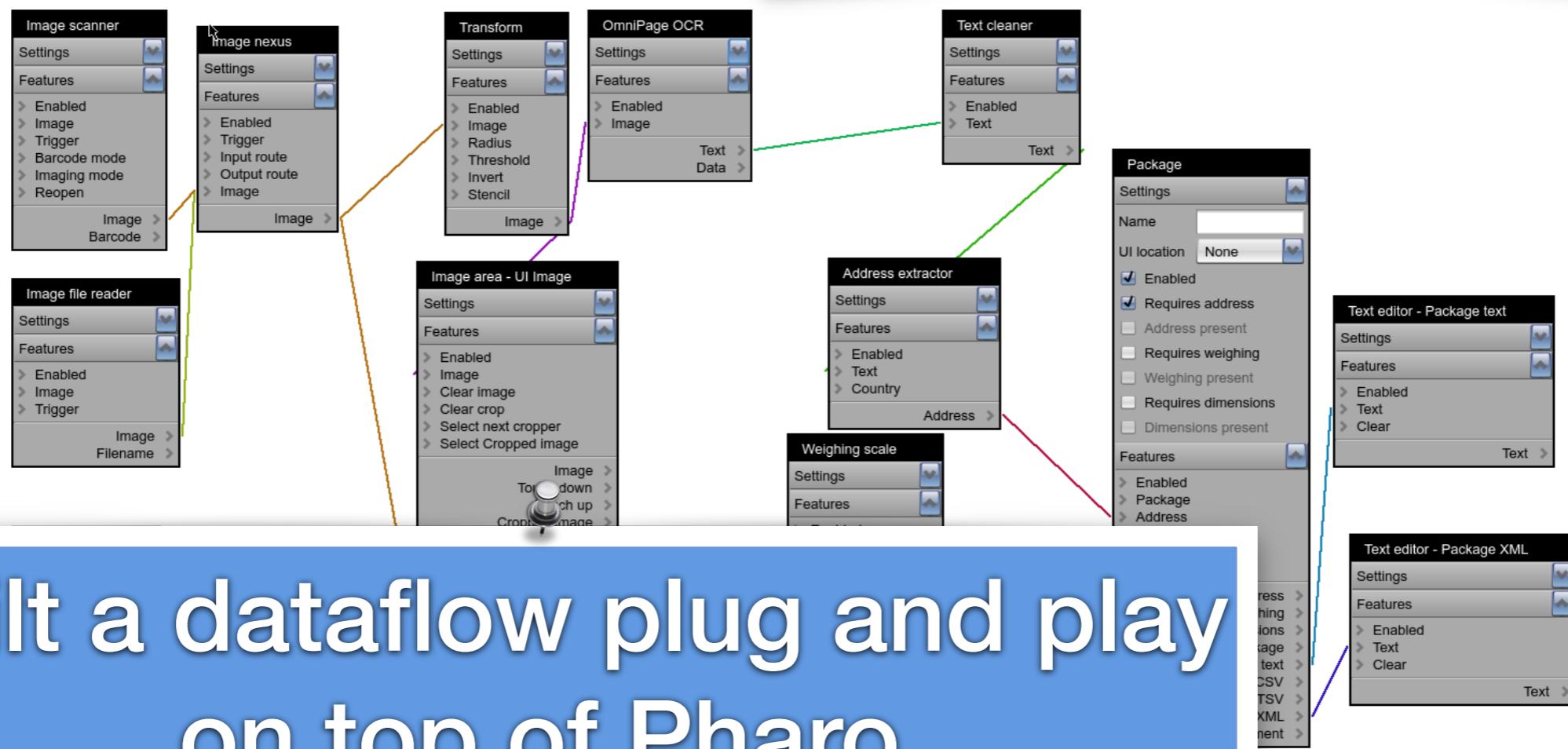
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Wind industry solutions

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Handle return mails in Switzerland



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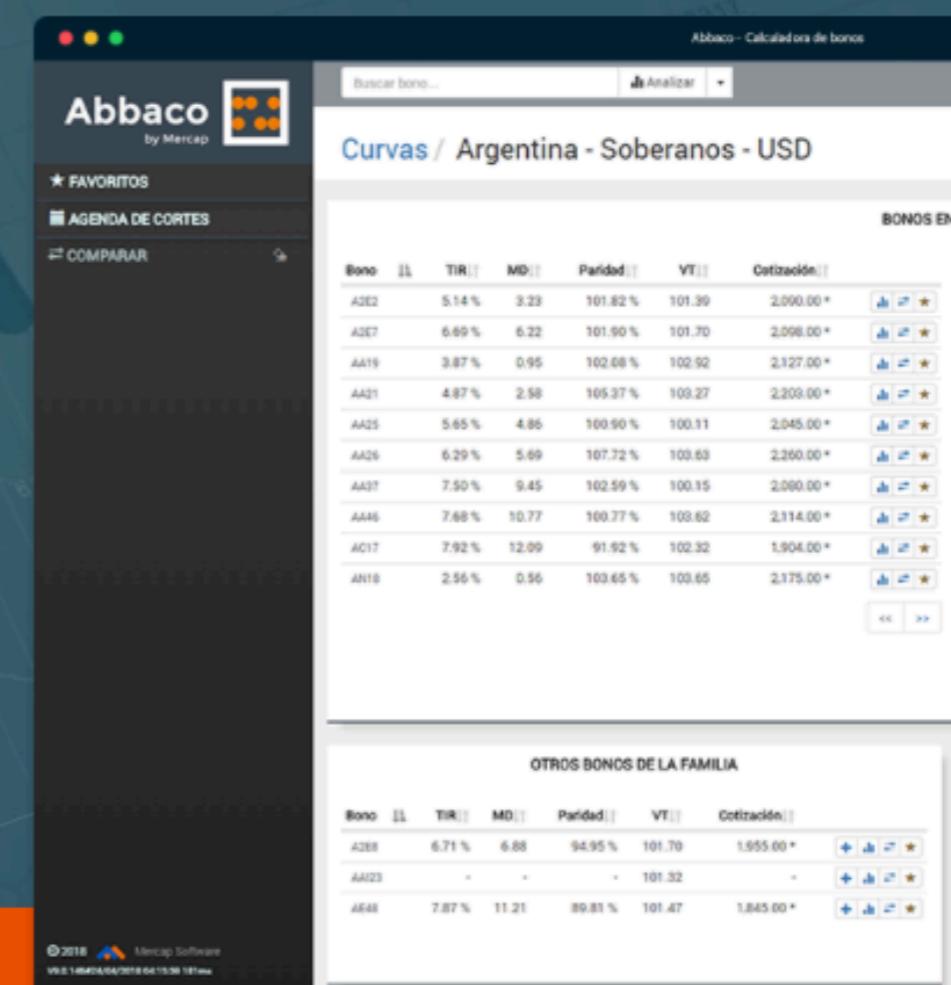
Specific home relocation registration

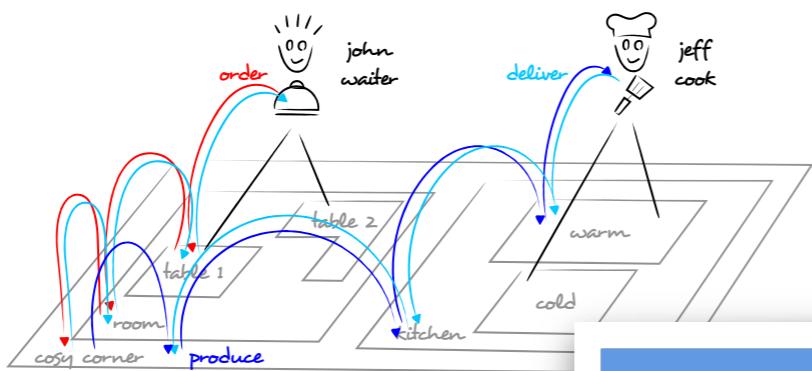


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from Argentina





Help growing startups Get back control on software

Playground

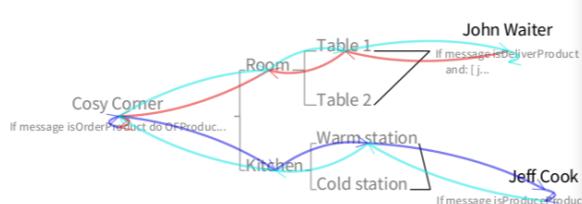
ofdemo2

"CONTRIBUTORS"

jeffCook := OFCookActor new name: 'Jeff Cook'.
johnWaiter := OFWaiterActor new name: 'John Waiter'.
"AREAS"
cosyCorner := OFVenueActor new name: 'Cosy Corner'.
kitchen := OFRoomActor new name: 'Kitchen'; parentArea: cosyCorner.
warmStation := OFKitchenActor new name: 'Warm station'; parentArea: kitchen; addContributor: jeffCook.
coldStation := OFKitchenActor new name: 'Cold station'; parentArea: kitchen; addContributor: jeffCook.
room := OFRoomActor new name: 'Room'; parentArea: cosyCorner.
table1 := OFTableActor new name: 'Table 1'; parentArea: room; addContributor: johnWaiter.
table2 := OFTableActor new name: 'Table 2'; parentArea: room; addContributor: johnWaiter.
"PRODUCTS"
steak := OFProduct new name: 'Steak'; characteristics: {OFPWarm}.
sandwich := OFProduct new name: 'Sandwich' ; characteristics: {OFPCold}.
cosyCorner products: { steak . sandwich }.

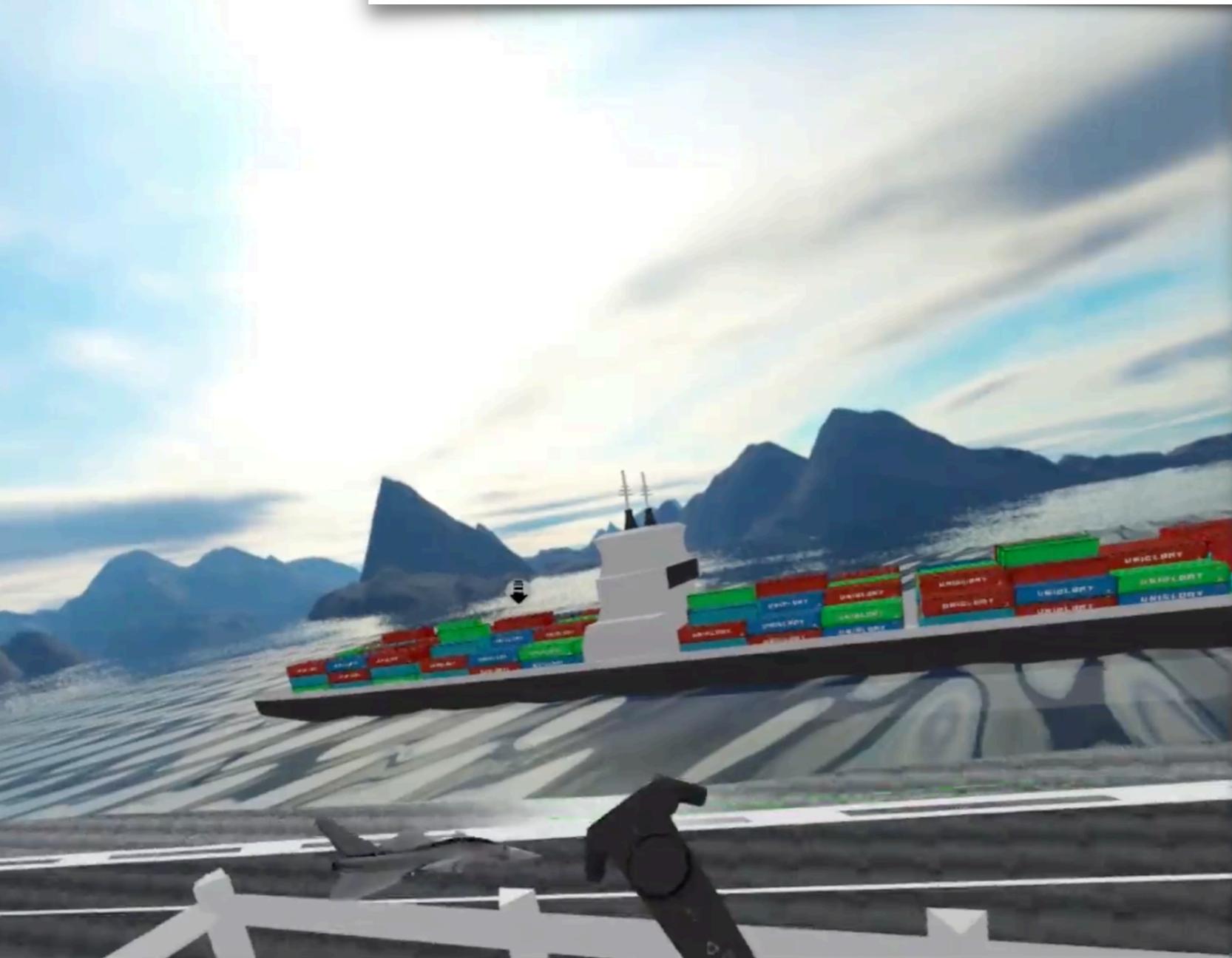
"MESSAGE HANDLERS"

cosyCorner addScriptedMessageHandler
when: [:message | message isOrderProduct];
execute: [:message :handler | OFProduceProductMessage new].
jeffCook addScriptedMessageHandler
when: [:message | message isProduceProduct];
execute: [:message :handler |
 handler
 queue: message
 to: [OFDeliverProductMessage new to: handler actor areas anyOne]].
johnWaiter addScriptedMessageHandler
when: [:message |
 message isDeliverProduct and: [:
 johnWaiter areas includes: message initialReason receiver]];
execute: [:message :handler |
 handler
 queue: message
 to: [self inform: message product gtDisplayString, ' delivered!']].
cosyCorner.
"ORDERS"
orderSteak := OFOrderProductMessage new product: steak; sendBy: johnWaiter to: table1.
orderSandwich := OFOrderProductMessage new product: sandwich; sendBy: johnWaiter to: table1.
cosyCorner



Loaded classes are up to date. Nothing to reload. (a minute ago)

Thales prototyping VR



Dharm

Playground

raftCarrier open.]

tmp

OVRWDemoAircraftCarrier

Scoped Variables History Navigator

Type. Pkg1/*Pkg2/Pk. ▾

- C ProtoObject
- C Object
- ! WDAApplication
- ! WDFPSEExample
- ! OVRWEmptyExample
- C OVRWExample
- C OVRWDemoAircra
- C OVRWDemoPickir
- C OVRWExampleCo!

-- all --
event handling
initialize
menu
scene content
updating

addAbeilleBourbon
addBarrel
addBoxes
addCargo
addCharlesDeGaulle
addHawkeye
addHelicopter
addObjectAt:orientation:
addPlayableAreaToScene
addRadar

Hier. Class Com.

OVRWExample subclass:
#OVRWDemoAircraftCarrier
instanceVariableNames:
'flyingRafaleNode teleportLocations
scrollGestureListener menu
operationQueue waterMaterial
dynamicsWorld'
classVariableNames: ''
package:
1/11 [2] – 1/11 [25] Format as you read W +L 1/3 [1]

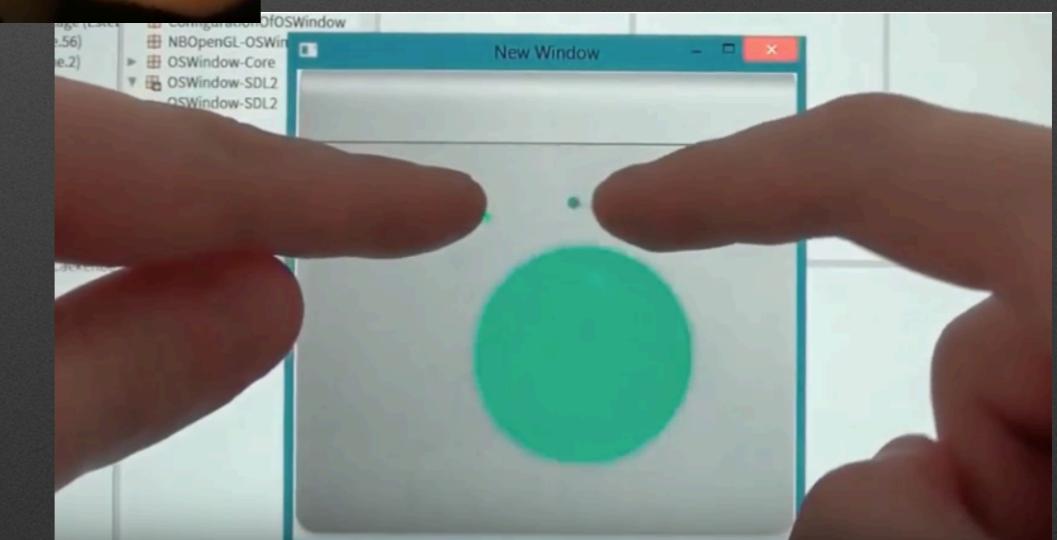
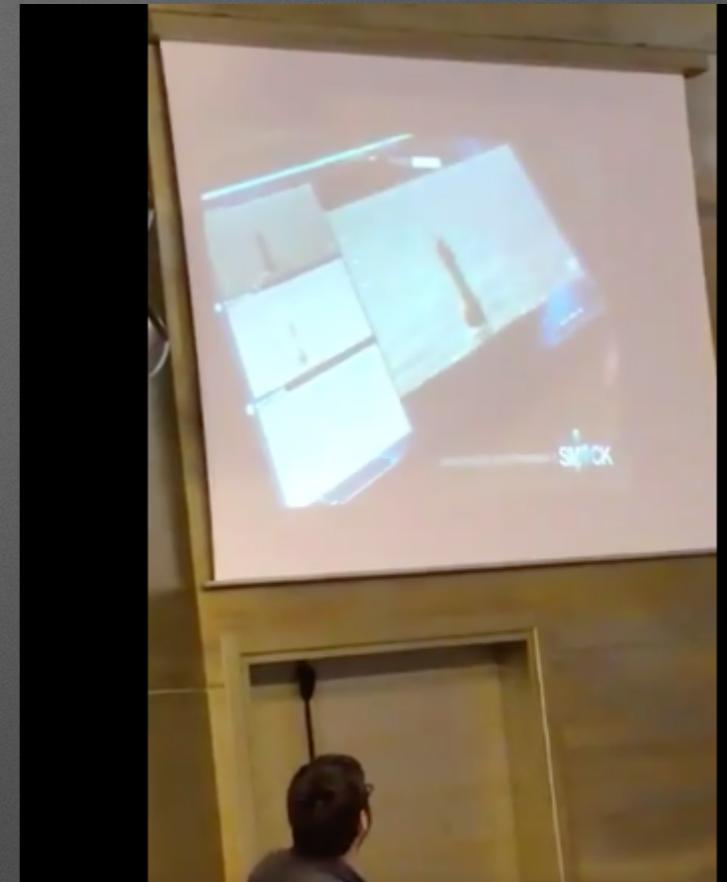
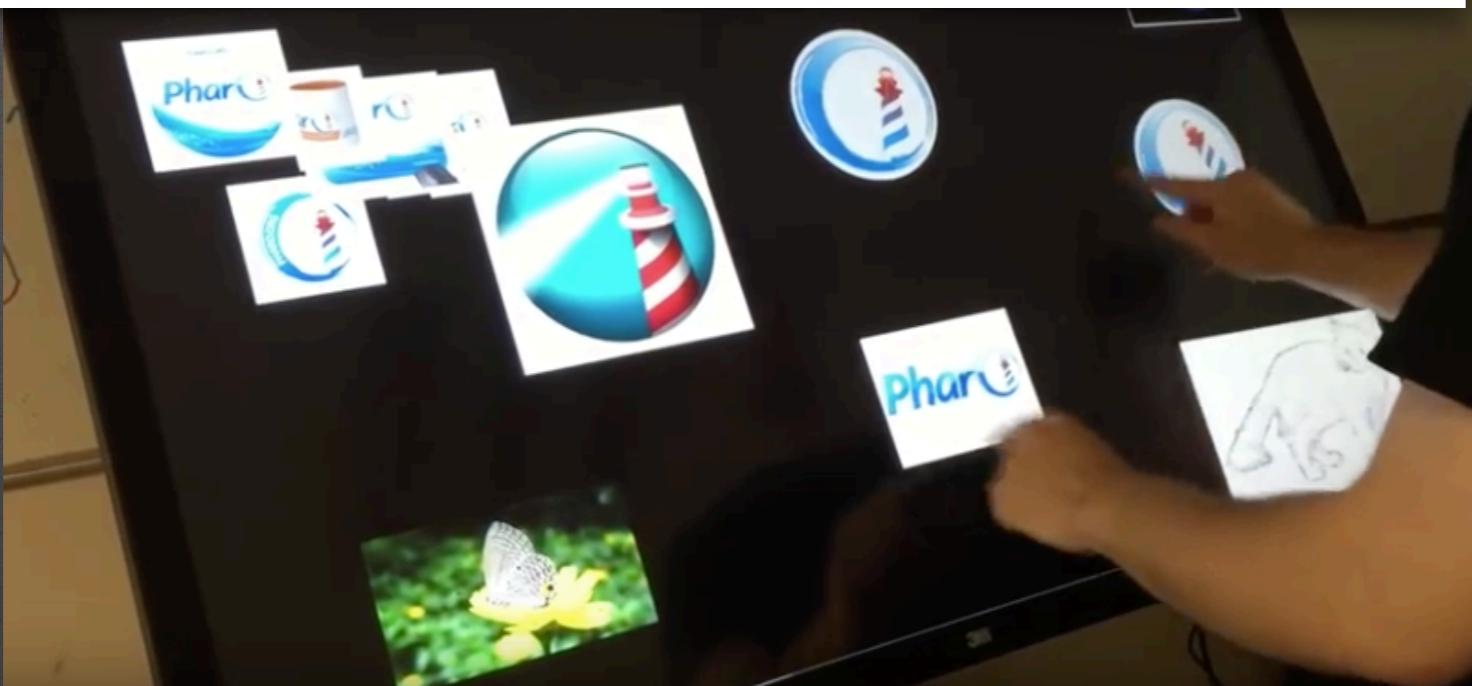
Controls:
- Big front button for teleportation
- Menu button to change the color of the sea

Class not referenced ? X
[dynamicsWorld] Instance variables not read AND written ? X
[dynamicsWorld] Variables not referenced ? X

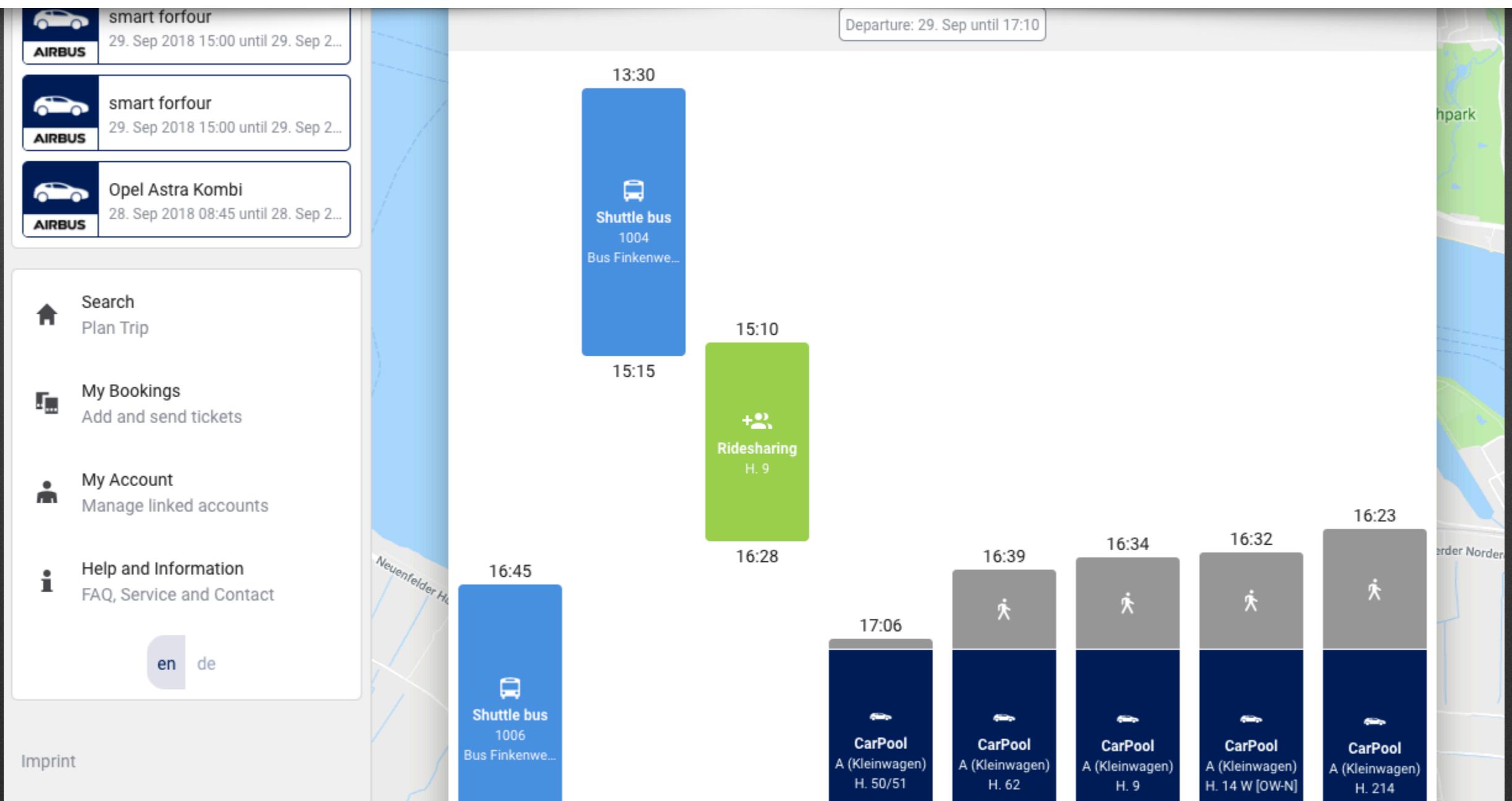
Helpful? Helpful? Helpful?

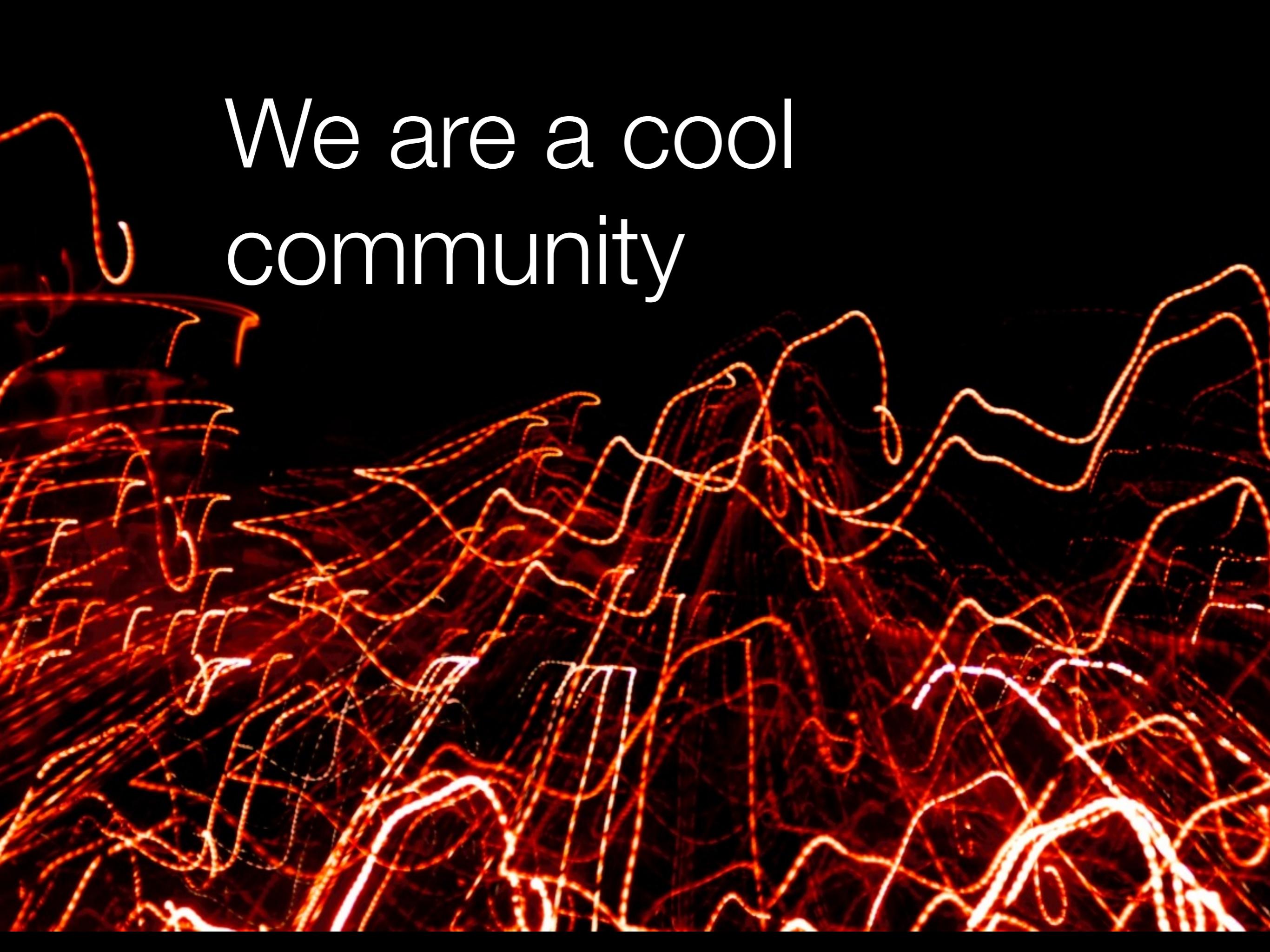
OVRWDemoAircraftCarrier Playground

Thales prototypes advanced interaction design



Mobility Map: a broker for mobility services multi-modal routing search docker running dozens of pharo





We are a cool
community

Some Pharo's Teachers

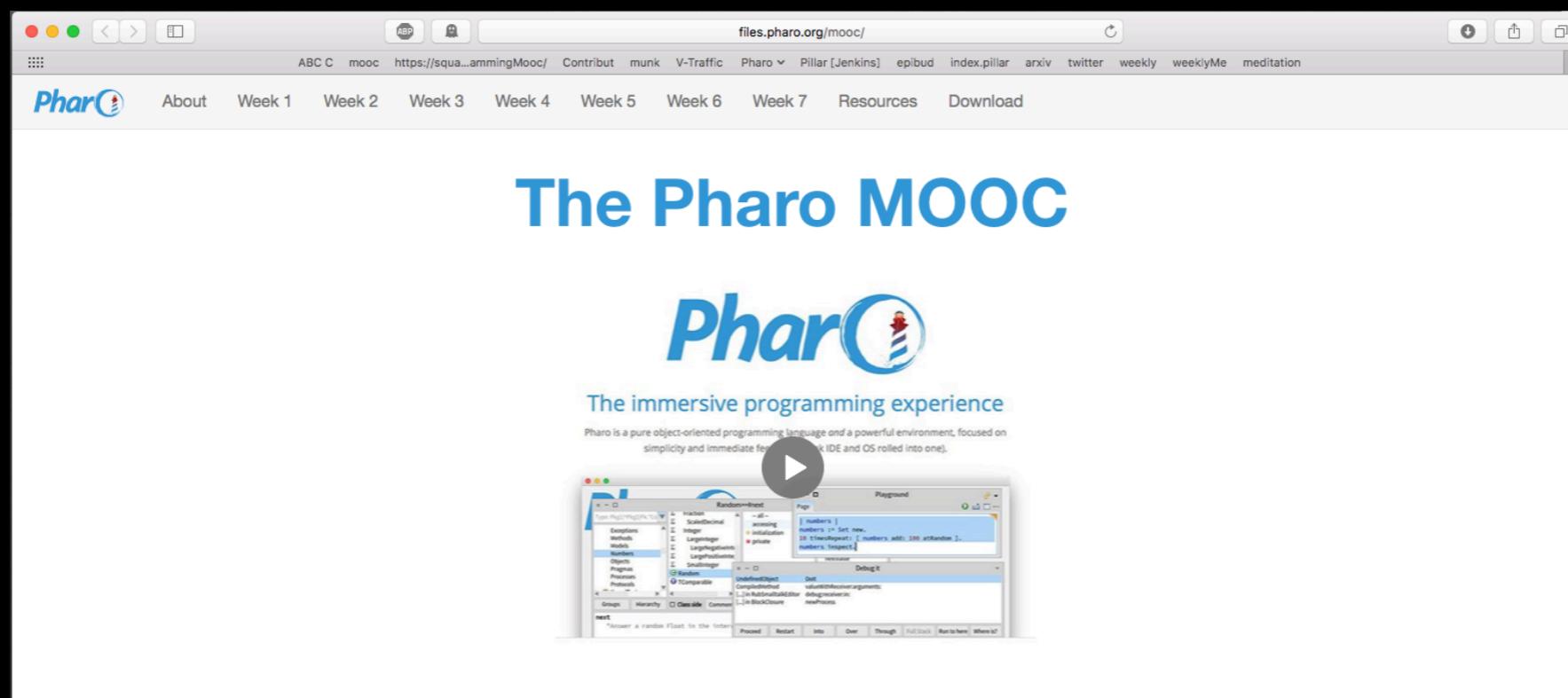
- Univ. of Novi Sad • Uni. of Buenos Aires • Uni. of Bern • Uni. of Maroua • Uni. of Brussels • Ecole des Mines de Douai • Uni. de Savoie • Ivan Franko Nat. Uni. • Czech Technical Uni. Prague • Northern Michigan Uni. • Uni. Technologica Nacional (UTN) • Uni. Catholic of Argentina • Uni. of Santiago • Uni. Policnica de Catalunya • Uni. de Bretagne Occidentale • Uni. of Tomsk • Uni. of Fernhagen • IT University of Copenhagen • Uni. of Yaounde • Uni. Lille • INFTI • Uni. of Lyon • Univ. of Montpellier • Uni. of Cordoba • Uni. of

Some Research Groups

Lafhis (AR)
CAR (FR)
RMOD (FR)
Ummisco (IRD)
Reveal (CH)
Lysic (FR)
CEA-List (FR)
Uqbar (AR)
OC (FR)
CCMI-FIT (CZ)

ASERG (BR)
Pleiad (CL)
SoftQual(Serb)
SRA (Jap)
GL (Bol)
UFMG (Br)
ETS (Can)
U.Chi (Can)
Soft (Be)
...

<http://mooc.pharo.org>



The screenshot shows a web browser displaying the Pharo MOOC website. The title "The Pharo MOOC" is prominently displayed in blue. Below it is the Pharo logo, which consists of the word "Pharo" in blue with a small orange icon of a person on a rocket ship next to the letter "o". A subtitle "The immersive programming experience" follows. A paragraph describes Pharo as a pure object-oriented programming language and environment, focused on simplicity and immediate feedback. An image of the Pharo IDE interface is shown, featuring a playground window with some code and a debugger window below it. At the bottom of the page, there is a section titled "About this course" with a brief description and links to further information.

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:

- [WebPortal](#): full online lecture with all videos and exercises,
- [CanalU](#): one of the key website that delivers ressources for teaching and research.

How to follow this MOOC?

We propose five profiles to follow this MOOC at different speed and levels. The Mooc sequences will be tagged according to these profiles. The profiles are not exclusive: to become a pharo expert you need to start as a newbie and grow up. Of course, you can also follow the full MOOC.

- **Total newbies [Newbies]** Focus on the beginning of the lectures, you can skip the Seaside/Mongo and tinyBlog exercises. Follow the end of the Mooc but without trying to understand everything. Take it easy and spend time understanding that the system is written in itself. Focus on the navigation tools (senders and implementors).
- **Looking for Web [Web]** For those that focus on web development, we suggest to get started with the syntax (since we really love this lecture you should really watch the not implementation

<http://discord.gg/Sj2rhxn>

The screenshot shows the Pharo Discord server interface. The left sidebar lists various channels: FOR NEW USERS, # learning-help, # mooc (selected), # general, # development, # offtopic, # iceberg, # bootstrap, LIBRARIES, # databases, # polymath, # roassal, # roassal-scriptoftheday, # seaside, # moose, # bloc, # ai, # ai-scriptoftheday, and Stepharo #1160. The # mooc channel has 23 new messages since 9:59 AM on November 23, 2017. The messages are:

- 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)

The right sidebar shows user lists: ADMIN—3 (Esteban Lorenzano, Juraj Kubeika, kilon), CHANNEL-ADMIN—7 (Alexandre Bergel, Clement Bera, PhilBack, Stepharo, Torsten Bergmann ...), and ONLINE—42 (akgrant0710, AlejandroInfante, awarenghem, Benoit Verhaeghe, and others). A message input field at the bottom says "Message #mooc".

<http://books.pharo.org>

Pharo Books

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

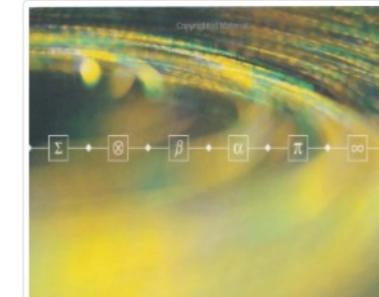
Contribute to the SquareBracketsAssociates community free books
<https://github.com/SquareBracketAssociates/>

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

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

The screenshot shows a web browser window with the URL <https://pharoweekly.wordpress.com> in the address bar. The page title is "WEEKLY NEWS ABOUT PHARO". Below the title is a subtitle: "Everything you wanted to know about <http://www.pharo.org> without being forced to read 1000 mails". A navigation bar at the top includes links for "HITCHHIKER'S GUIDE TO ...", "SMALLTALK, TIPS'N TRICKS", "COG BLOG", and "ABOUT". The main content area features two posts:

NOV 25 2017 [WHAT ABOUT CONTRIBUTING?](#)

UNSORTED [EDIT](#)

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 23 2017 [\[PHARO 7.0A\] NEXT ENHANCEMENTS 2](#)

UNSORTED [EDIT](#)

Report period: 5 November 2017 to 23 November 2017 Report period: 5 November 2017 to 23 November 2017

- * 20739-Remove-dead-stream-primitives >> <https://pharo.fogbugz.com/f/cases/20739/Remove-dead-stream-primitives>

Issue URL: <https://pharo.fogbugz.com/f/cases/20739> PR URL: <https://github.com/pharo-project/pharo/pull/524> Diff URL: <https://github.com/pharo-project/pharo/pull/524/files>

Thanks to clementbera

- * 20645-Windows-rebuildFieldAccessors-problem >> Fixing the creation of anonymous classes



**Pharo is our vehicle
We improve it
everyday**

**For us Pharo is the
beginning of the journey and
we are building the road**

**Pharo is
research friendly**

We are ready
to help you
validate
your ideas

We can be
guinea pigs

Actively supporting research

The screenshot shows the Pharo Smalltalk IDE interface. On the left, the 'Spotter' pane is open, displaying a search history with items like '#Menu 15/62', 'System Browser', 'Playground', 'Test Runner', 'Spotter', 'Iceberg', and 'Monticello Browser'. A message at the bottom encourages sending diagnostic and usage data. On the right, the 'NumberParser' browser pane is active, showing a list of packages and a detailed view of the 'NumberParser' class. The 'NumberParser' class is selected, and its definition is displayed:

```
Object subclass: #NumberParser
  instanceVariableNames: 'sourceStream base neg integerPart fraction'
  nDigits lastNonZero requestor failBlock'
  classVariableNames: ''
  package: 'AST-Core-Parser'
```

The 'NumberParser' class is highlighted in blue. To the right of the browser, a 'History Navigator' pane lists various search terms and their counts.

SCG (Uni. Bern)

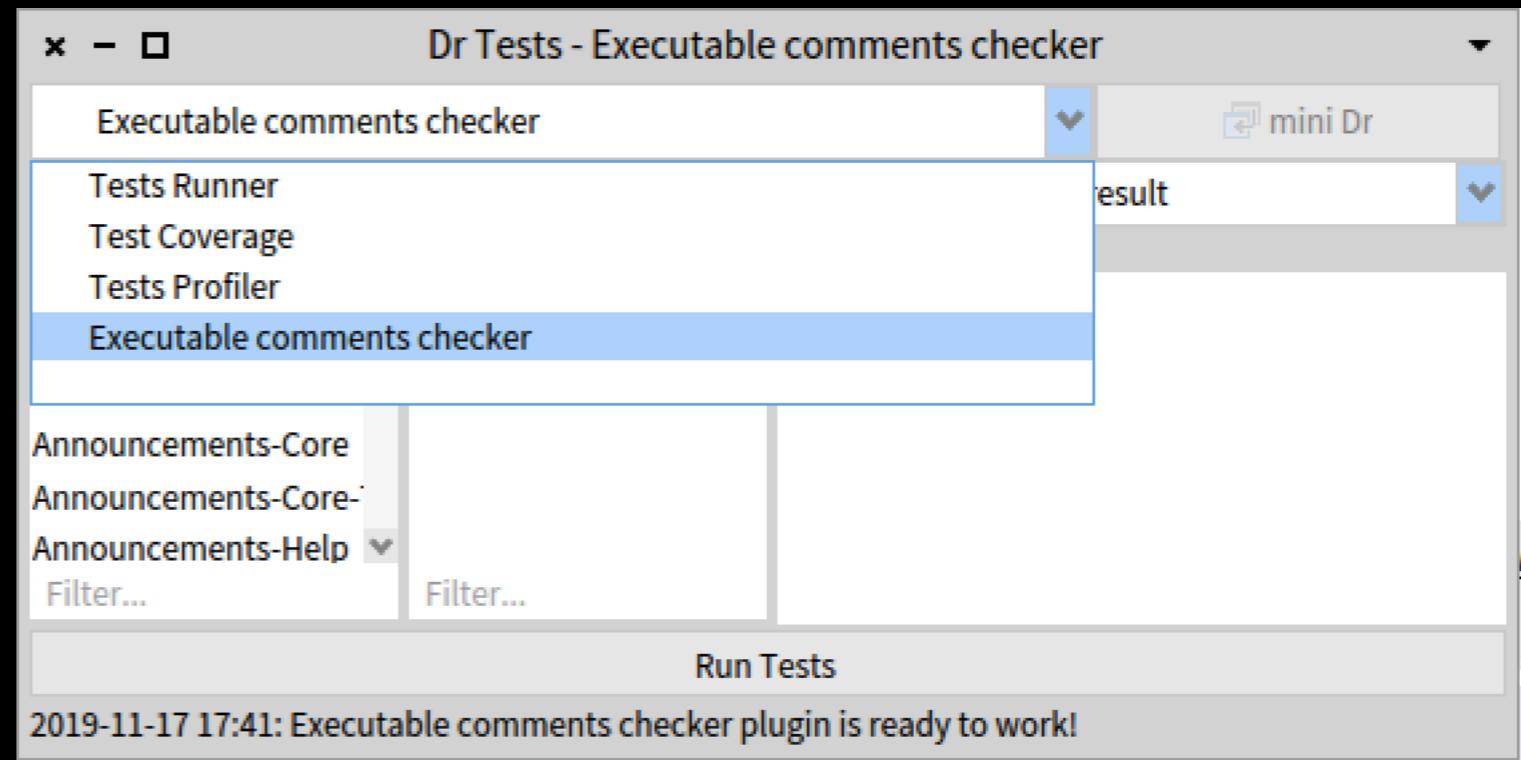
1/9 [1] Format as you read W +L

Utility methods ? X Helpful?

Best Paper Award @ ICPC'19

**Kubelka, Bergel, Robbes,
“Live Programming and Software Evolution:
Questions during a Programming Change Task”**

DrTests: a plugin-based architecture to plug test analyses...



We validated our 25000
tests for Rotten Green
Tests (ICSE'19)

Test Amplification

by S. Demeyer, H. Rocha, M. Abdi

Code Review

by A. Bachelli, ObjectProfile

Join us

- Have fun with us.
- There are plenty of opportunities