

# PolyMath

## ESUG 2018 updates

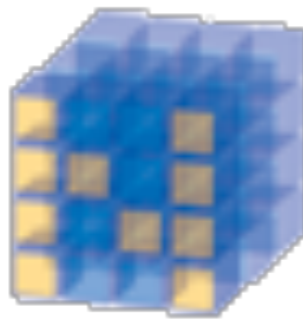
**Serge Stinckwich, Oleksandr Zaytsev**



# PolyMath

- New name of SciSmalltalk
- A general purpose numerical computation framework in Smalltalk
- MIT Licence
- <https://github.com/PolyMathOrg/PolyMath>

# Related works



# Main packages

- Matrix, Statistics moments, Polynomials, Interpolations, Integration, Series, Linear Algebra (DHB)
- Ordinary Differential Equations Solver (RK4, AB2, ...)
- Complex numbers, Quaternions
- Random Number Generators
- KD-Trees
- Arbitrary Floating-point arithmetics

# Main contributors

- Didier H. Besset (DHB packages)
- Nicolas Cellier (arbitrary floating point arithmetics)
- Stéphane Ducasse (Refactorings, packaging, documentation)
- Werner Kassens (KDETree)
- Hernán Morales Durand (Random Number Generator)
- HwaJong Oh (combinaisons/permutations)
- Serge Stinckwich (documentation, integration)
- Natalia Tymchuck (ODE)
- Daniel Uber (first version)
- Oleksandr Zaytsev (DataFrame)

# Sponsors



# Announcement

# **PolyMath 1.0 Alpha**



# What new at the infrastructure level ?

- New name
- Consistent naming for the classes (PM prefix) and the packages (Math)
- Book almost in sync with the code
- Available on github
- CI jobs running on Travis for Pharo 6.0, 7.0
- More tests (767 now)

# New packages in PolyMath

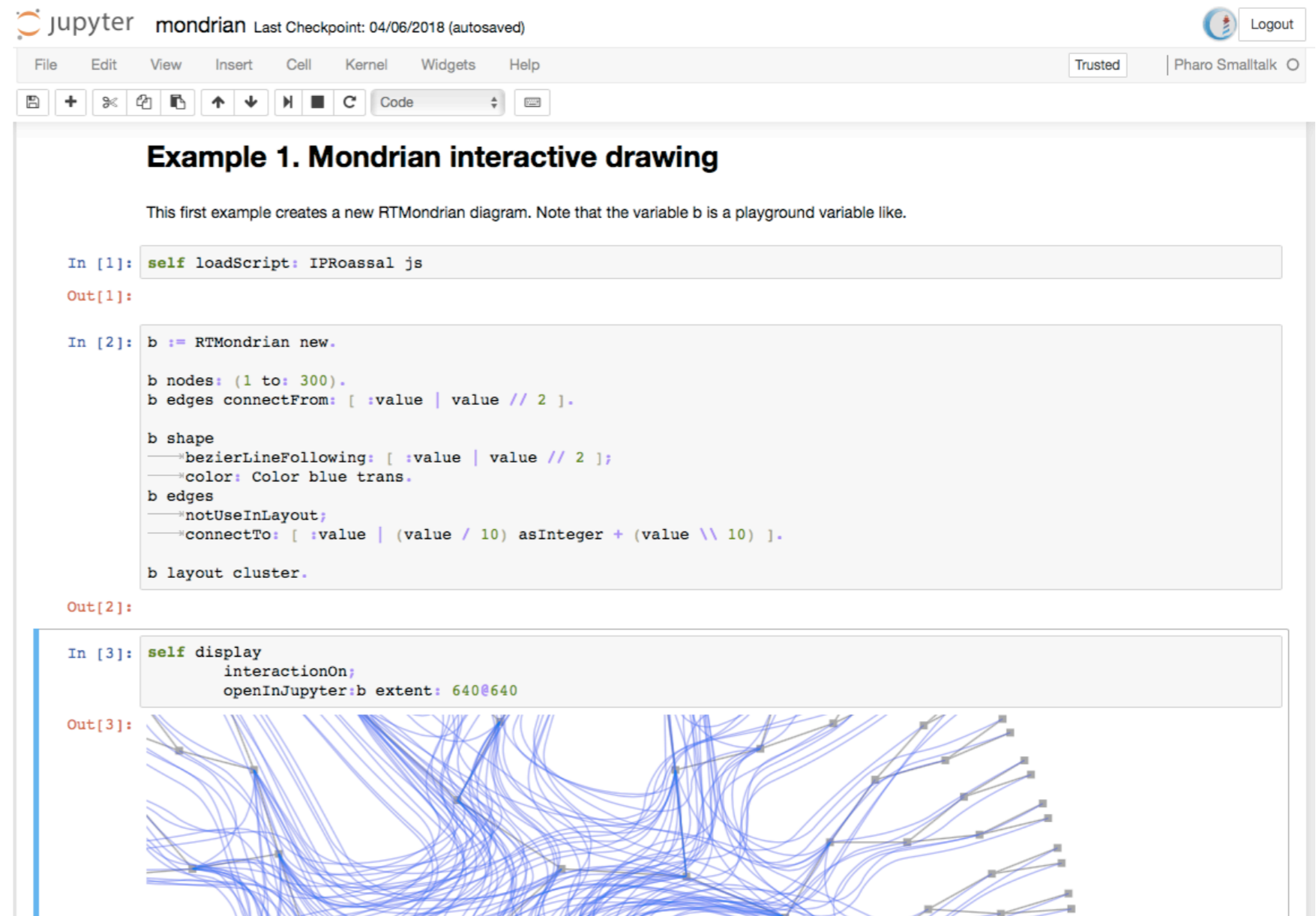
- **TensorFlow** (already seen in a previous talk)
- **DataFrame** (GSOC 2017 project from Oleks)

# PolyMath Book

- Original Book from Didier Besset in 2000
- New book (remove all Java part of the book)
- Creative Commons Licence
- 410 pages
- Will be available when PolyMath 1.0 is released: <https://github.com/SquareBracketAssociates/NumericalMethods>
- Thank you Didier !

# JupyterTalk

- Jupyter are notebooks
- A Pharo kernel for Jupiter done by Jesus Mari Aguirre



The screenshot shows a Jupyter notebook titled "mondrian" with a last checkpoint of "04/06/2018 (autosaved)". The interface includes a menu bar (File, Edit, View, Insert, Cell, Kernel, Widgets, Help) and a toolbar with icons for file operations and execution. The notebook content is as follows:

### Example 1. Mondrian interactive drawing

This first example creates a new RTMondrian diagram. Note that the variable b is a playground variable like.

```
In [1]: self loadScript: IProassal js
Out[1]:
```

```
In [2]: b := RTMondrian new.
        b nodes: (1 to: 300).
        b edges connectFrom: [ :value | value // 2 ].

        b shape
        —>bezierLineFollowing: [ :value | value // 2 ];
        —>color: Color blue trans.
        b edges
        —>notUseInLayout;
        —>connectTo: [ :value | (value / 10) asInteger + (value \\ 10) ].

        b layout cluster.
Out[2]:
```

```
In [3]: self display
        interactionOn;
        openInJupyter:b extent: 640@640
Out[3]:
```

The output of the third cell is a complex, dense network of blue lines and nodes, representing a Mondrian-style drawing.

<https://github.com/jmari/JupyterTalk>

# Roadmap

- PolyMath 1.0 release (before the end of the year)
- Book release at the same time
- Organise PolyMath documentation
- We are welcoming contributions in all mathematics area (statistics, symbolic computation, ...)
- Use TensorFlow bindings