



Toplo, Bloc & Spec

A Graphic Layer for the Present and Future



THALES



Pablo Tesone & Martín Dias - ESUG 2025 - Gdansk

In this presentation:

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Pharo Consortium
Engineer



@tesonep 

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Pharo Consortium
Engineer



@tinchodias 

**Just in the
presentation effort...
a lot of development
behind**

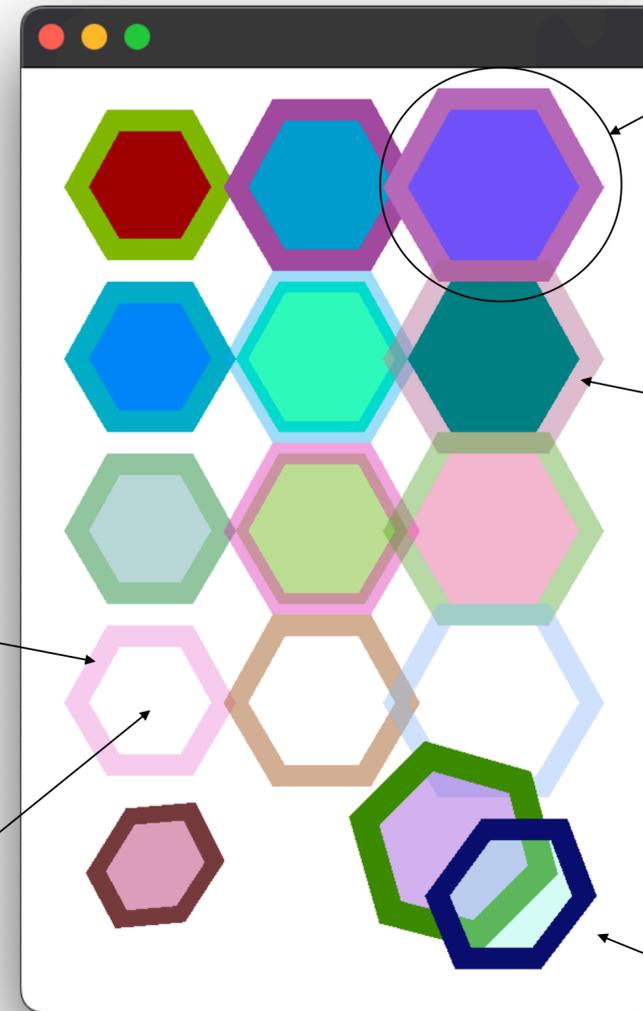
What is Bloc?

A low-level UI infrastructure
& framework for Pharo



border

background



element

geometry
(polygon)

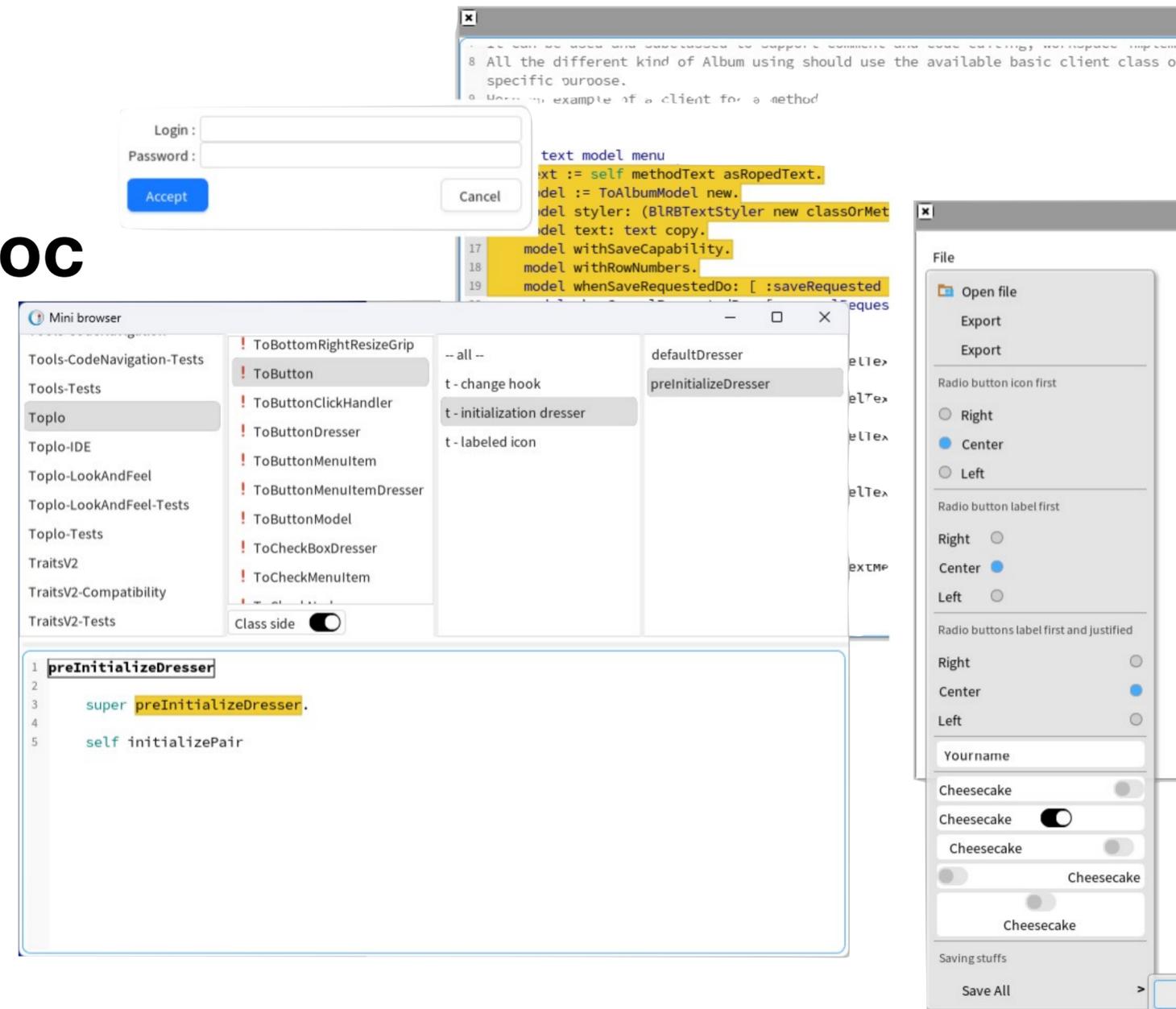
transformation
(a matrix with
skew and translation)



What is Toplo?

A widget library on top of Bloc

- No New Revolutionary Concepts
 - Keep it Simple
 - Bloc has many of the features
- Bloc + Element States and Skins
- + 25 Widgets ready to use
- Collaboration with



THALES

Lab-STICC

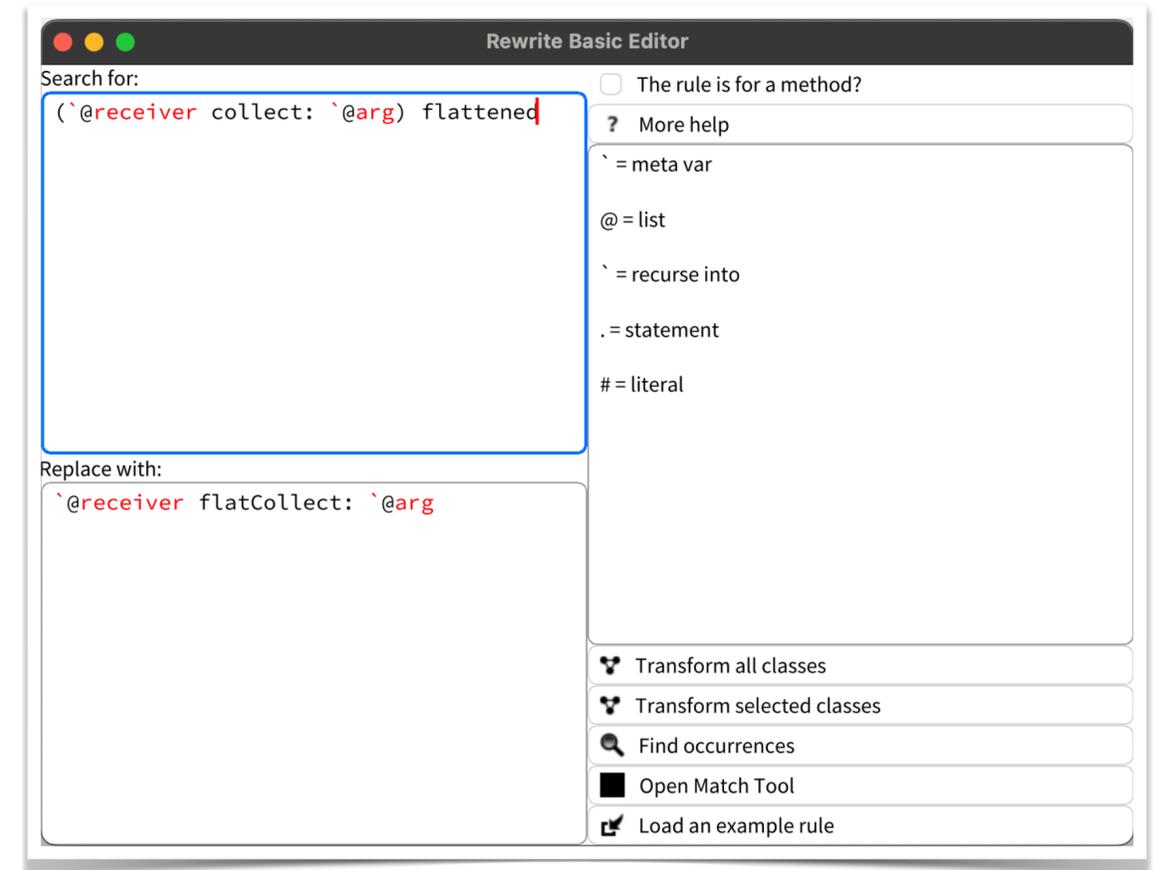
UBO
Université de Bretagne Occidentale



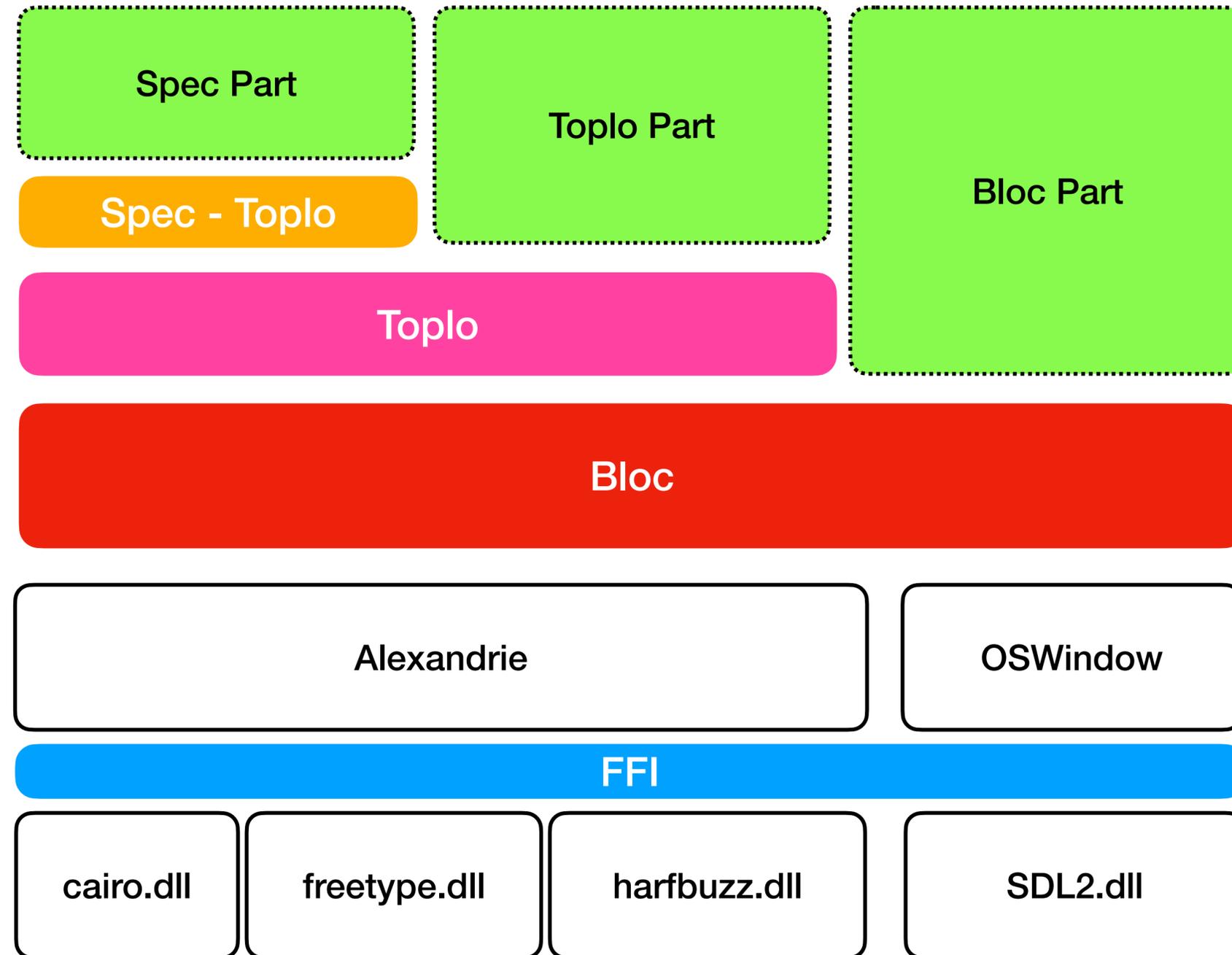
What about Spec?

The power of Toplo, the ease of Spec

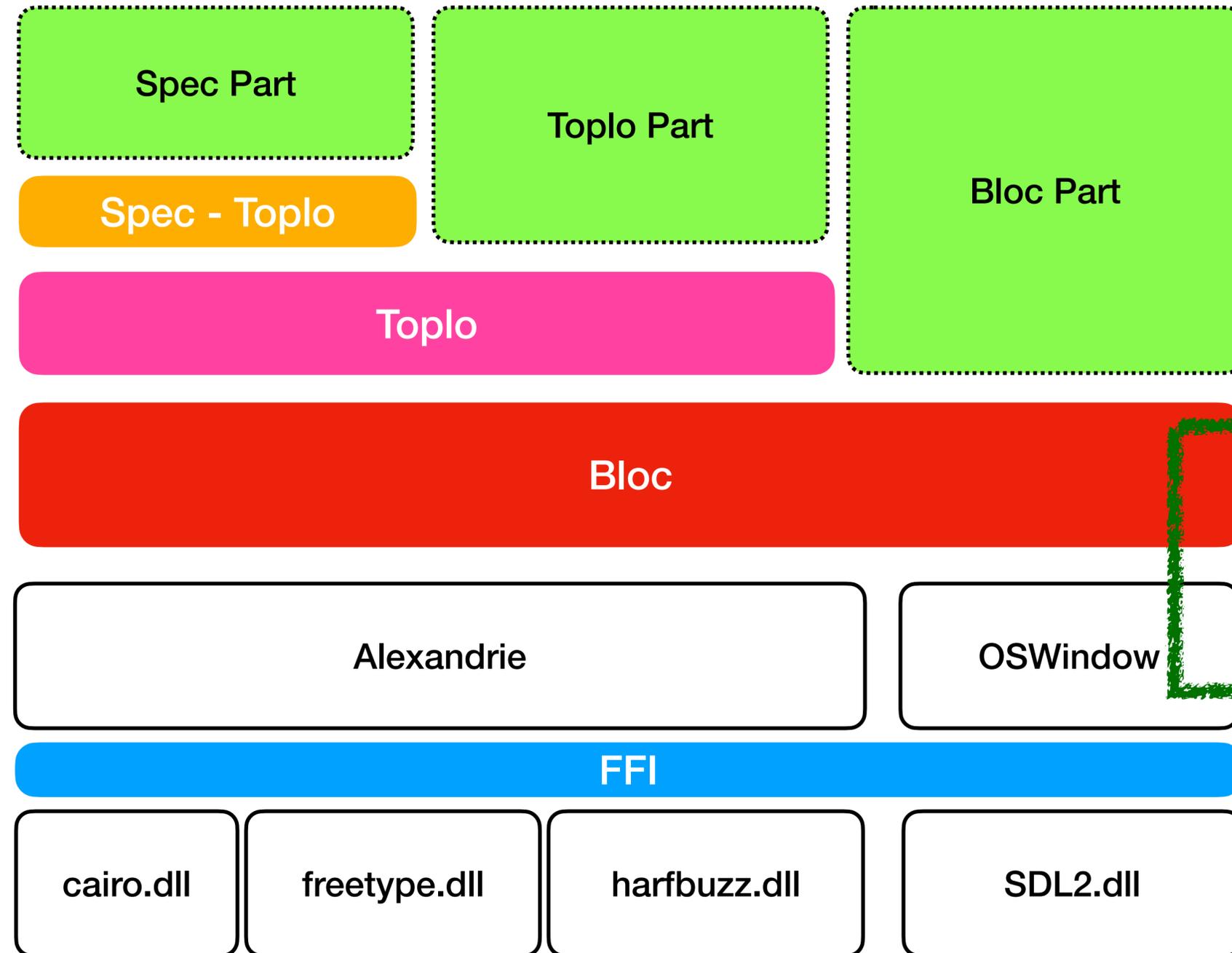
- Toplo backend for Spec
- Switch backend transparently
- Full support



An Application Stack for Everyone



An Application Stack for Everyone



Use what you need when you need it



Why Cairo and SDL2 / SDL3?

Simple FFI bindings to C libraries



- Works on all Pharo's platforms
- GPU acceleration (and especially in SDL3)
- Active game-development community
- Stable with active development. Support by gnome community (it's the way to draw custom widgets in GTK 3 and GTK 4).
- Not GPU-optimized but we can use buffering, layer composition and other techniques to mitigate.



Releases

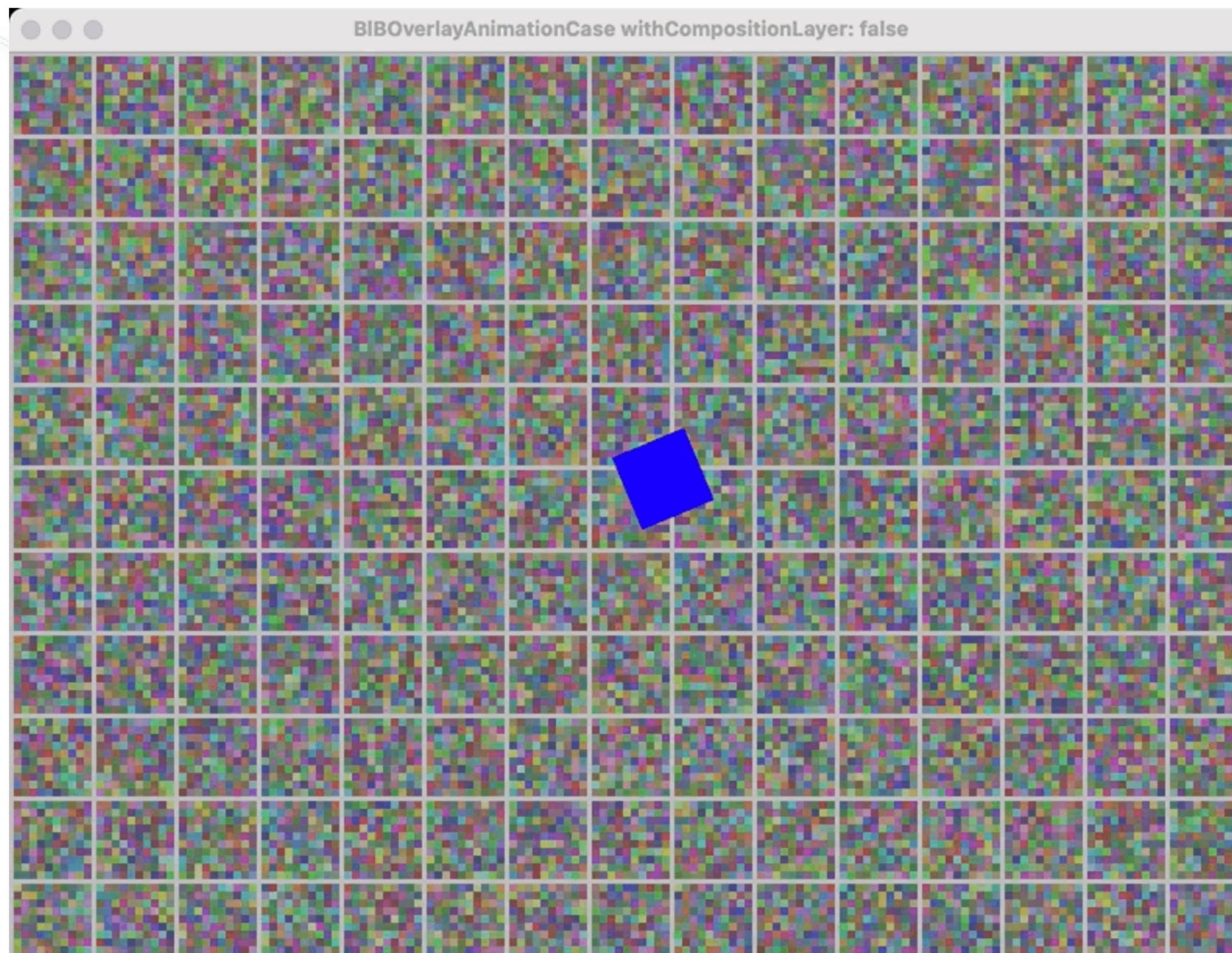
New Versions Available

- Bloc v2.5.0
- Toplo v0.6.0
- Spec-Toplo v0.6.0
- Alexandrie v2.5.0
- Album v0.6.0

**Release policy:
~ every 2 months**

Bloc

Damaged Areas - Bounds Optimizations

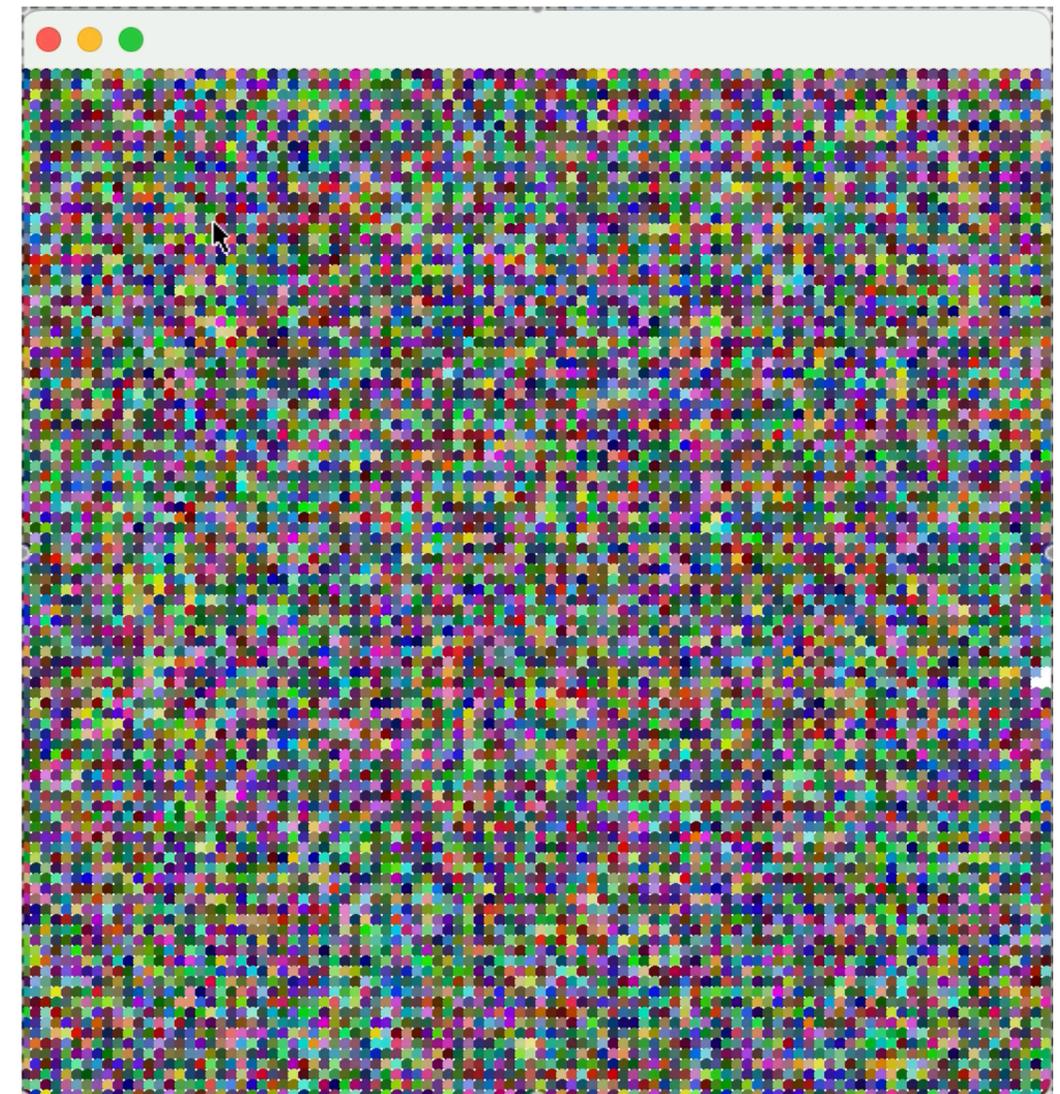


**Overlays where
not performant,
we were drawing
all**

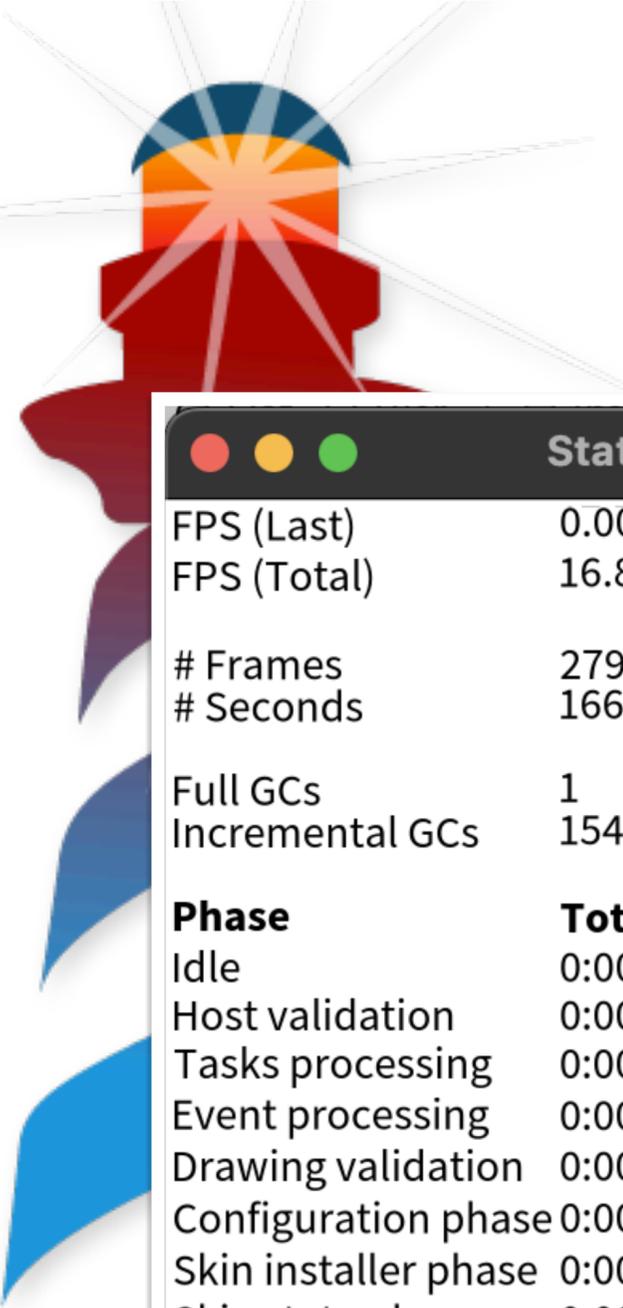
Damaged Areas - Bounds Optimizations

- Overlay benchmarks ~ 15x faster
- Heavy drawing benchmarks ~ 30% improvement
- Other benchmarks ~ 15% improvement

**10k elements in the space,
handling the mouse over
~ 25x faster**



Benchmarks & Metrics

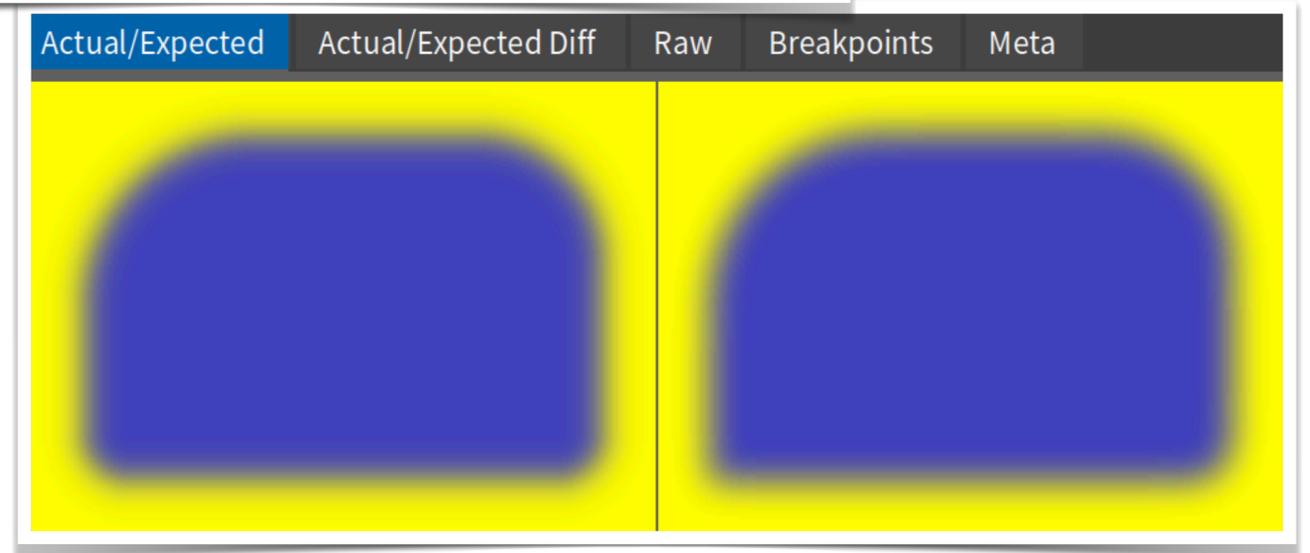
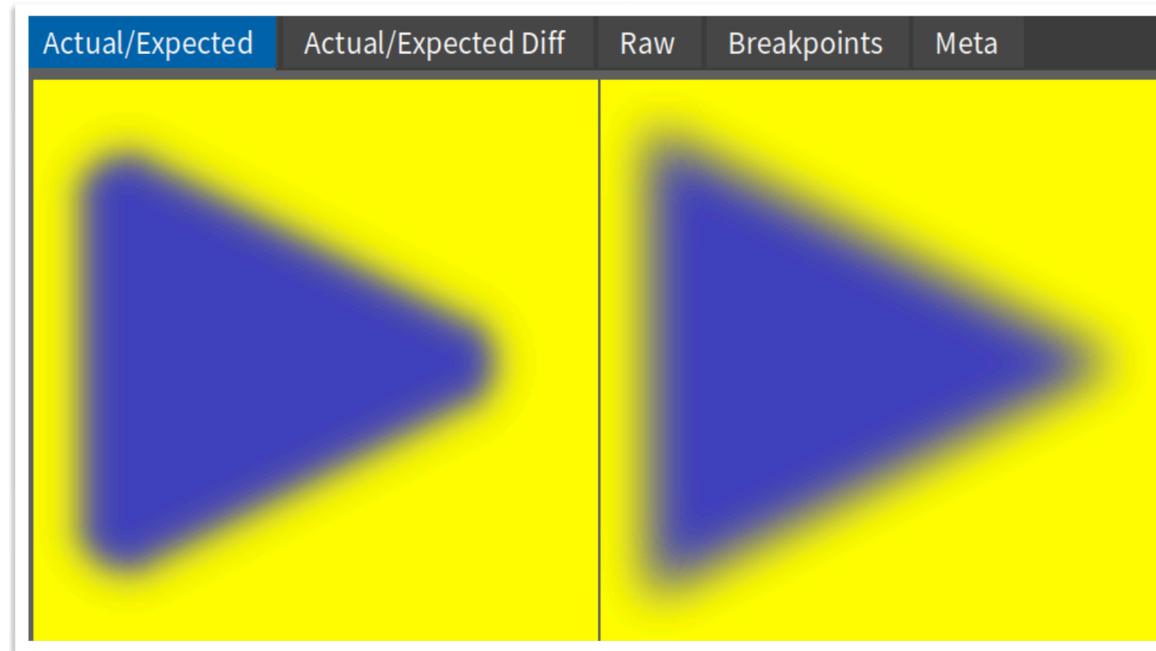
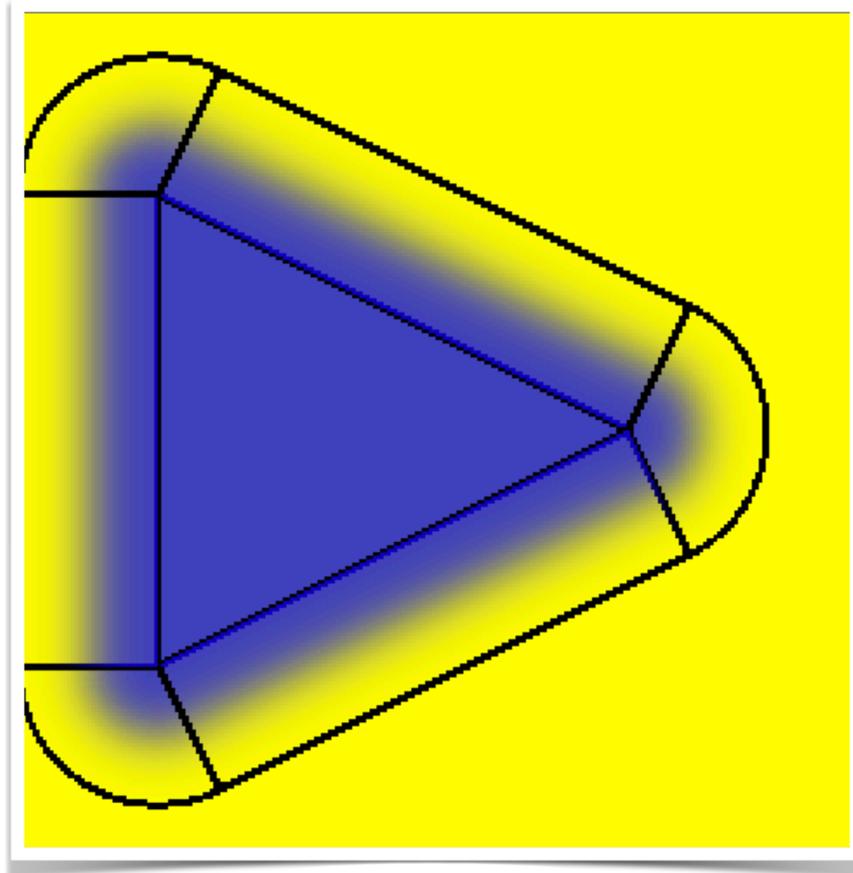


Statistics	
FPS (Last)	0.00
FPS (Total)	16.81
# Frames	27929
# Seconds	1661
Full GCs	1
Incremental GCs	1546
Phase	Total Time (ms)
Idle	0:00:00:00 [0 %]
Host validation	0:00:00:00 [0 %]
Tasks processing	0:00:00:00.088 [0 %]
Event processing	0:00:00:06.828 [42 %]
Drawing validation	0:00:00:00.014 [0 %]
Configuration phase	0:00:00:00.006 [0 %]
Skin installer phase	0:00:00:00 [0 %]
Skin state phase	0:00:00:00.051 [0 %]
Layout	0:00:00:00.762 [4 %]
Drawing	0:00:00:08.226 [51 %]

- 55 Benchmarks
- Running in All platforms
- Automated Execution
- Covering most of the functionalities
- Realtime Measuring Tools

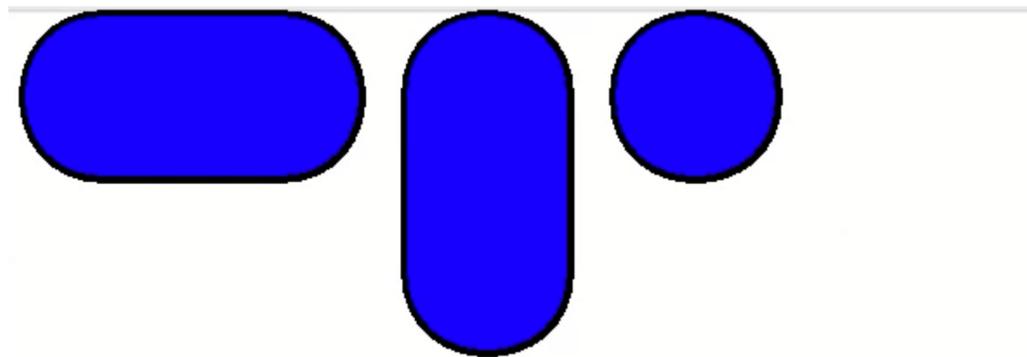
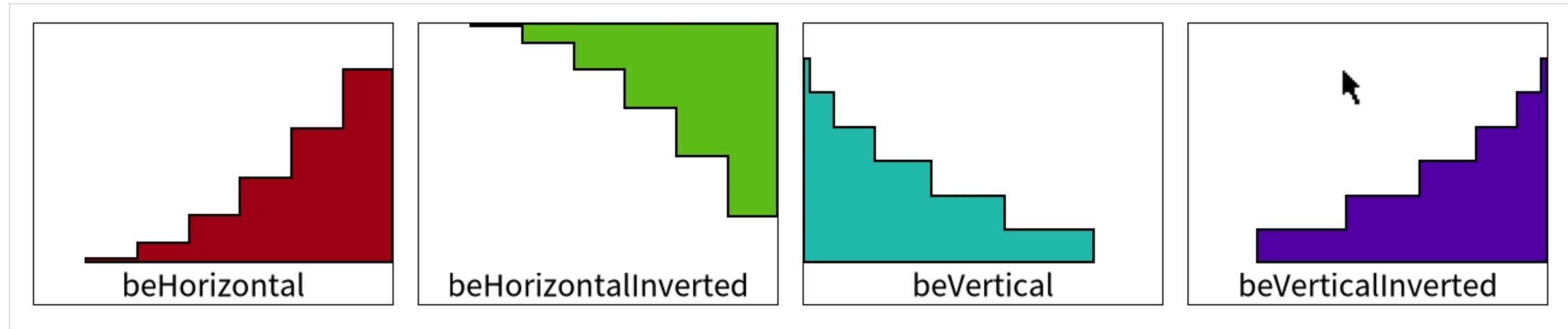
Optimized Shadows

Use gradients to emulate shadows



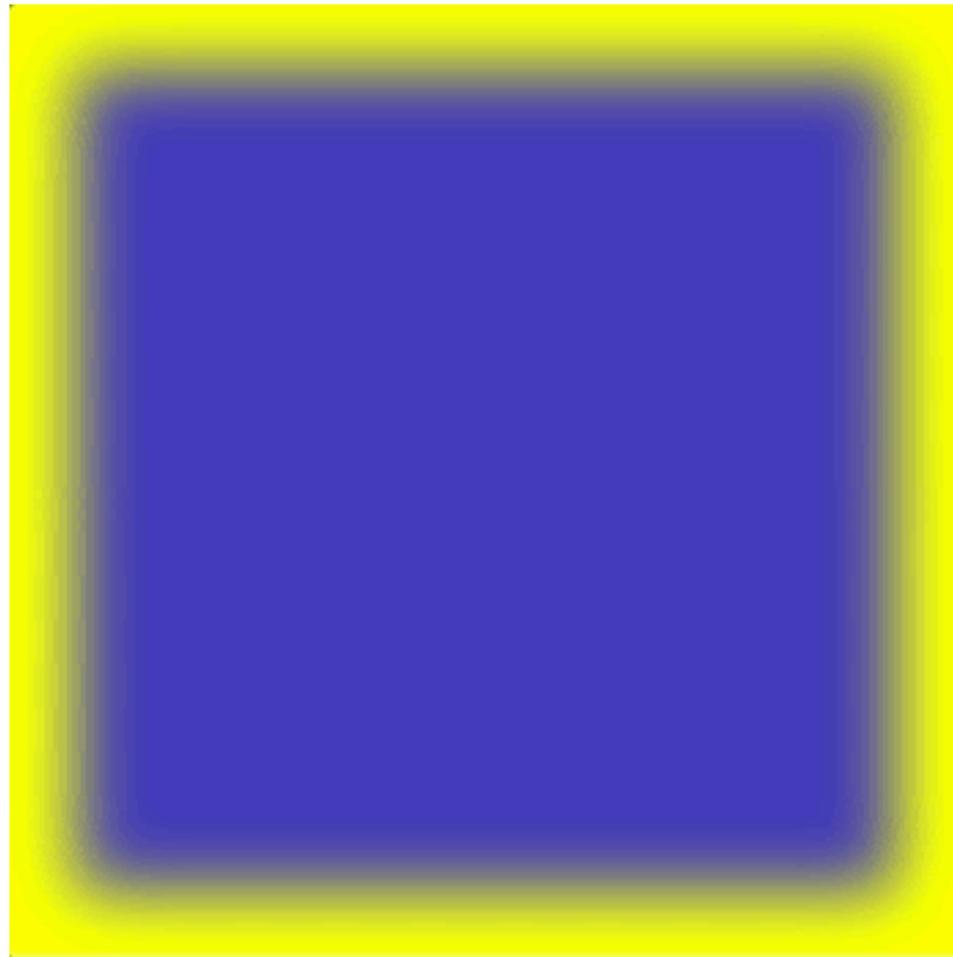
More Geometries

Histogram, Stadium and Sigmoid

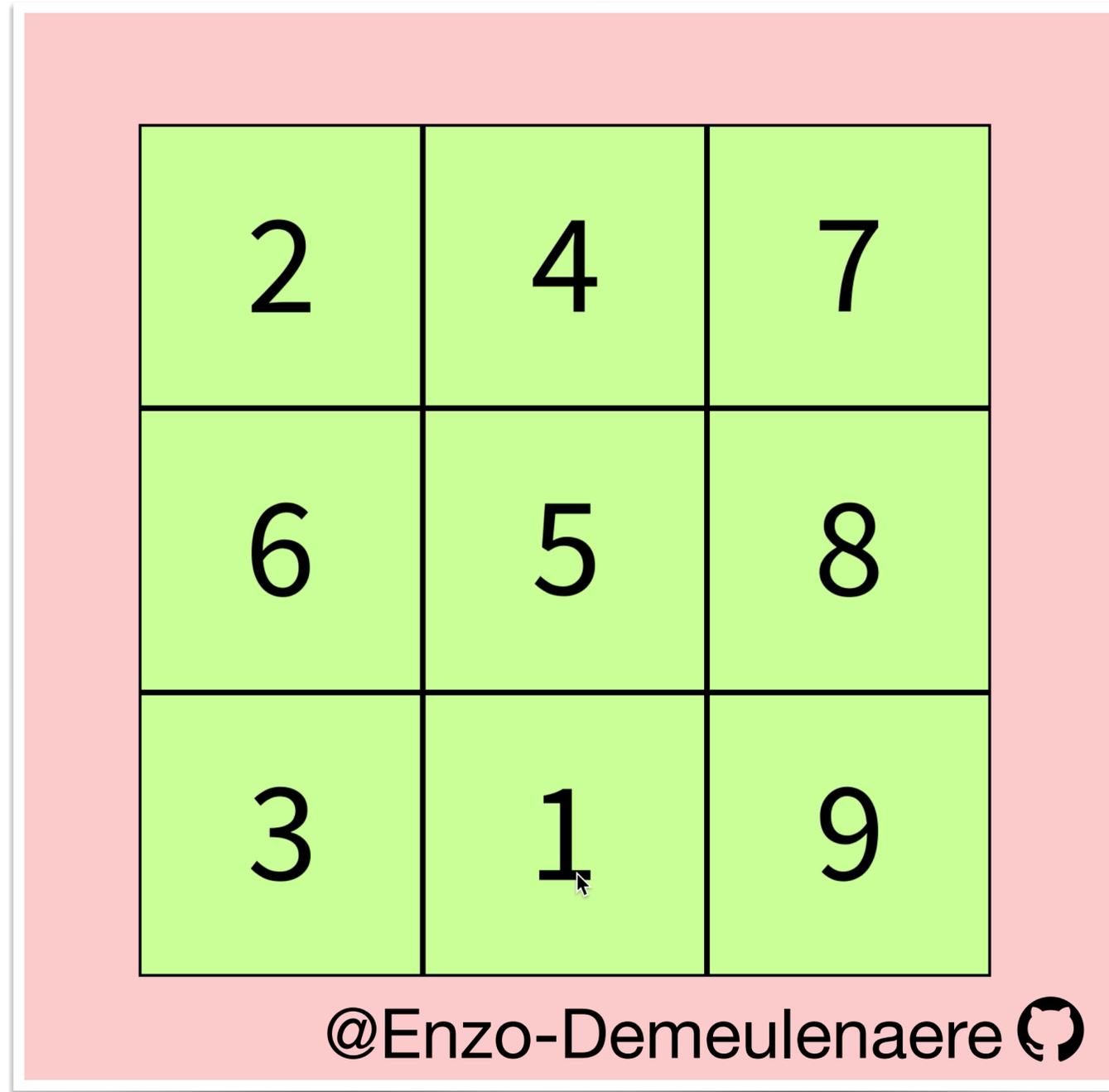


New Demos

Color Picker + Paint & Gradients



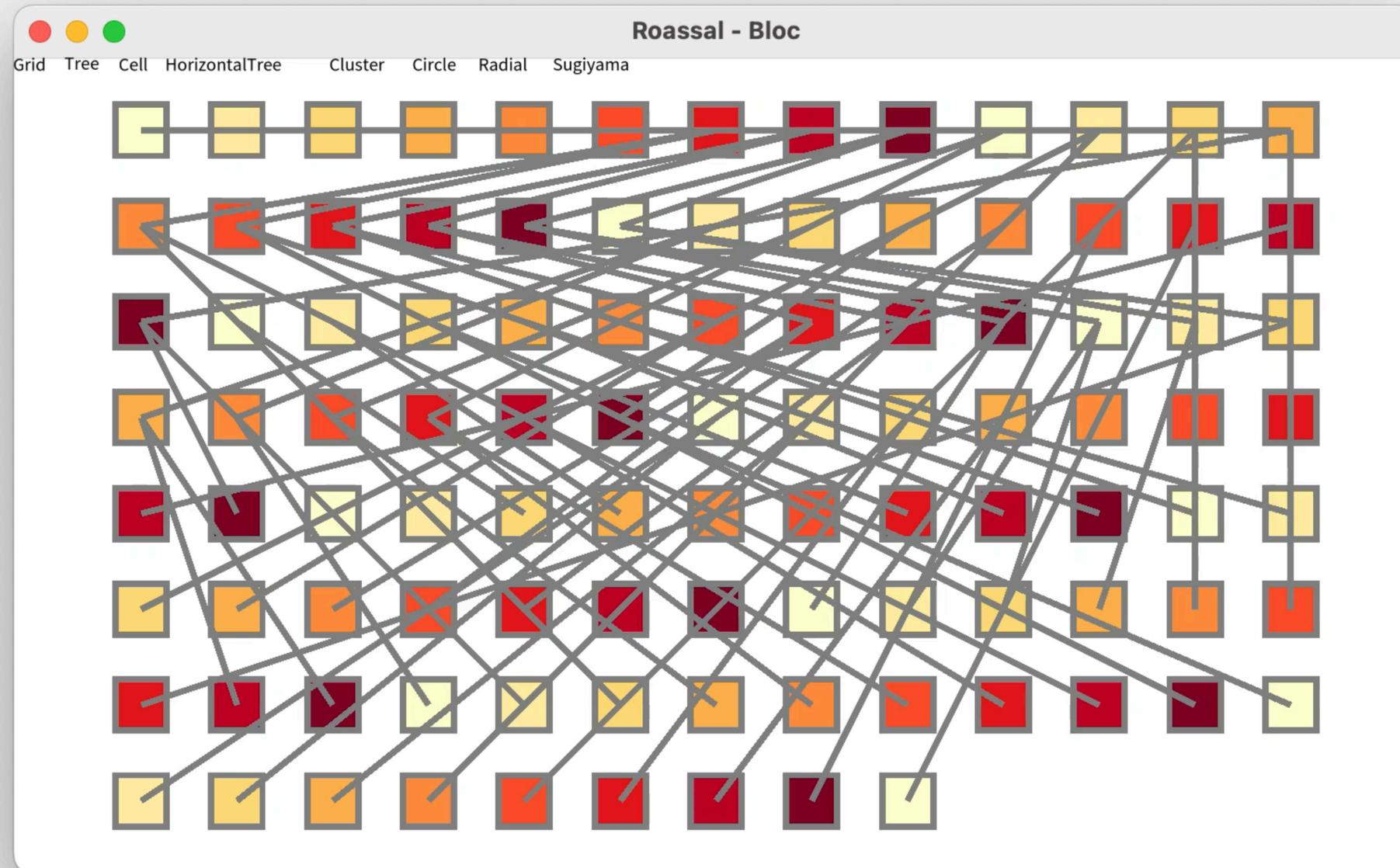
New Demos: Drag & Drop game



2	4	7
6	5	8
3	1	9

@Enzo-Demeulenaere 

Roassal in Bloc





Other Improvements in Bloc

- Clean ups & Simplifications
- Documentation and Comments
- Better Scaling in HDPI Screens
- Better naming conventions
- Bug-fixing
- Saving / Restoring image keeps open spaces
- Improvements in Animations, Texts
- Fix Text Styler
- Fix Set Cursor
- More Tests

+500 Commits
12 Contributors

Toplo



@plantec 

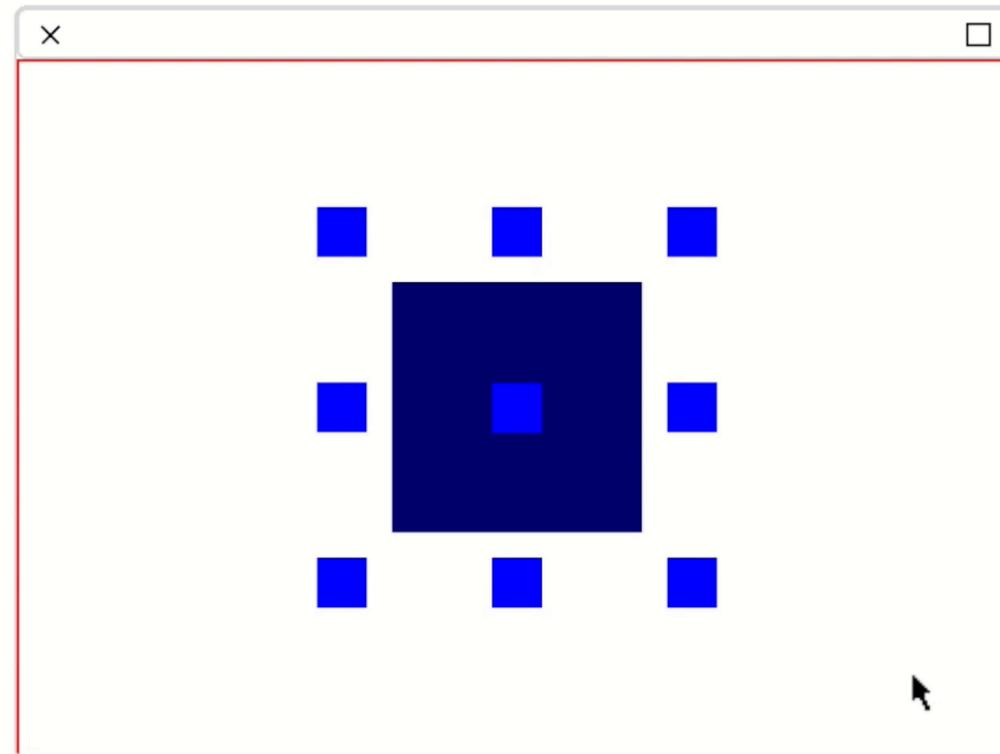


Better Menus and Tooltips

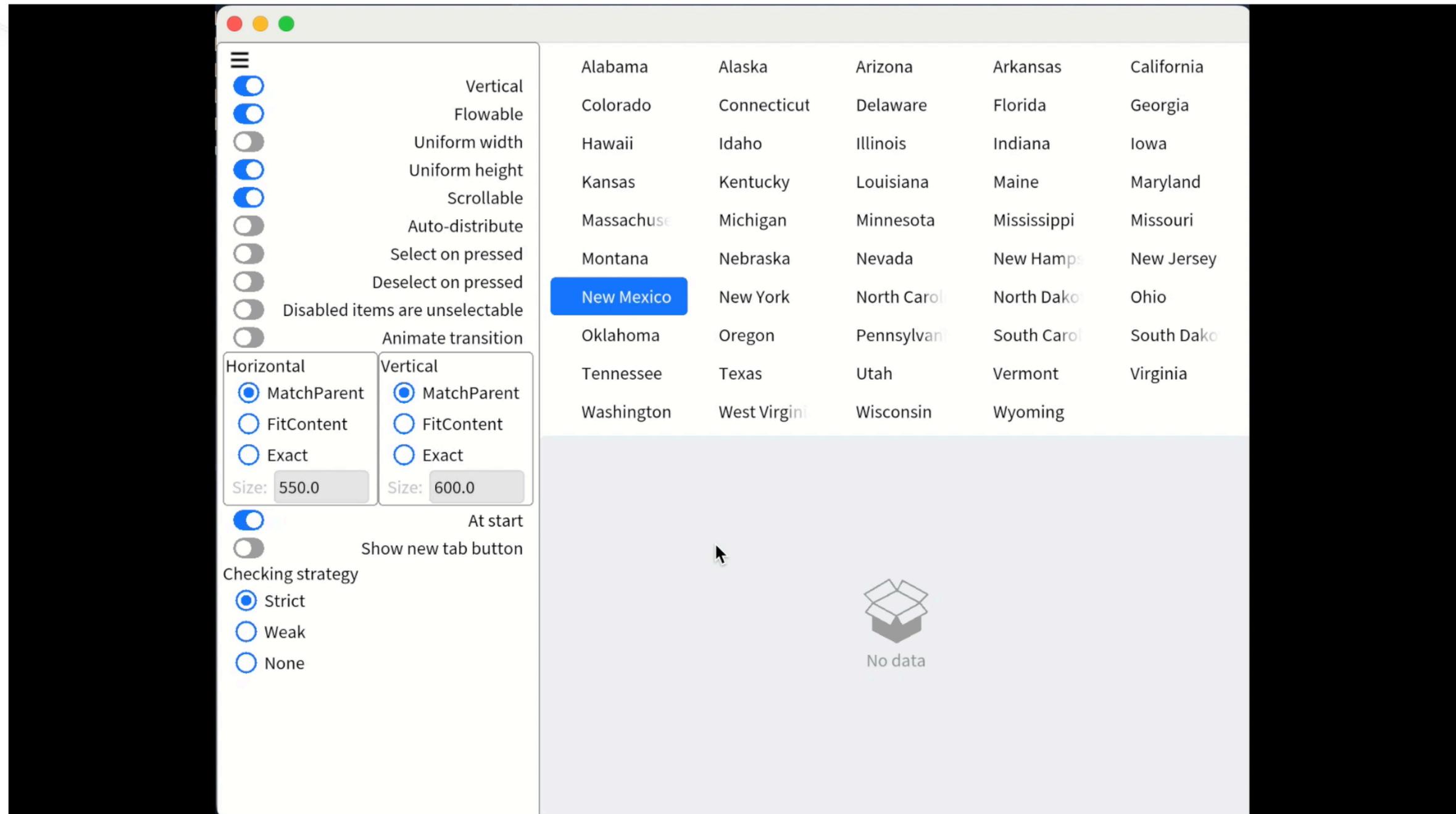


```
x - □
x
Edit Inspect Statistics  Disable
1 example_CodeEditor
2
3 | pane menuPane text album menuBuilder disabox inspectBtn
  showStatisticsBtn fileMenu |
4   pane := ToPane vertical matchParent.
5
6   text := self methodText asRopedText.
7   album := ToAlbum new.
8   album stycler: (BlPharoCodeStyler new
9     classOrMetaClass: self [class;
10    yourself).
11  album text: text copy.
12  album withSaveCapability.
13  album withRowNumbers.
14  album whenSaveRequestedDo: [ :saveRequested |
15    saveRequested accepted: true ].
16  album whenCancelRequestedDo: [ :cancelRequested |
17    cancelRequested editorElement text: text copy ].
18
```

Anchor Layout & Floats



Tab Pane Improvements



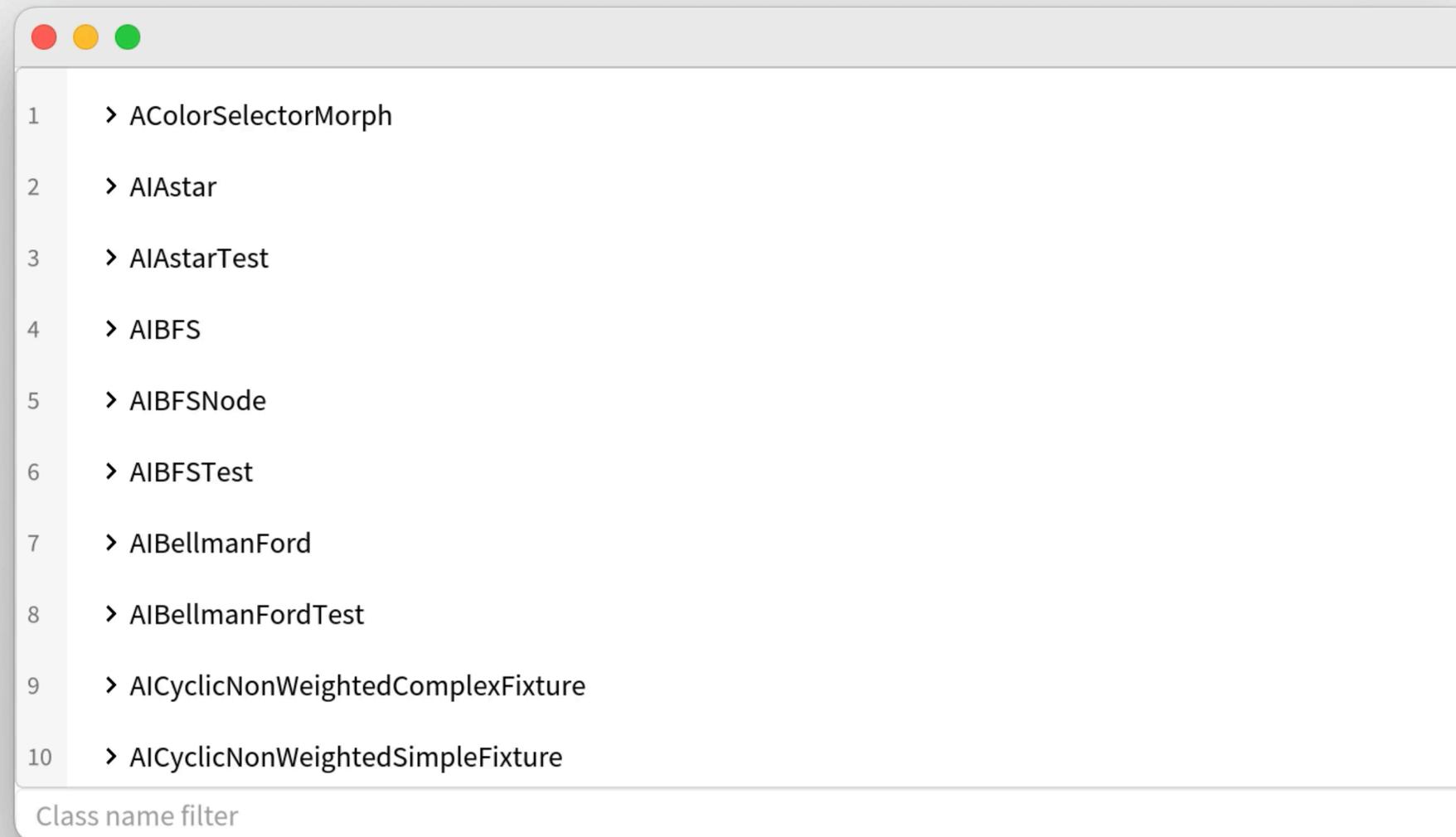
The screenshot displays a tab pane with a list of US states. The 'New Mexico' tab is selected. The settings panel on the left includes the following options:

- Vertical
- Flowable
- Uniform width
- Uniform height
- Scrollable
- Auto-distribute
- Select on pressed
- Deselect on pressed
- Disabled items are unselectable
- Animate transition
- Horizontal: MatchParent, FitContent, Exact, Size: 550.0
- Vertical: MatchParent, FitContent, Exact, Size: 600.0
- At start
- Show new tab button
- Checking strategy: Strict, Weak, None

Alabama	Alaska	Arizona	Arkansas	California
Colorado	Connecticut	Delaware	Florida	Georgia
Hawaii	Idaho	Illinois	Indiana	Iowa
Kansas	Kentucky	Louisiana	Maine	Maryland
Massachusetts	Michigan	Minnesota	Mississippi	Missouri
Montana	Nebraska	Nevada	New Hampshire	New Jersey
New Mexico	New York	North Carolina	North Dakota	Ohio
Oklahoma	Oregon	Pennsylvania	South Carolina	South Dakota
Tennessee	Texas	Utah	Vermont	Virginia
Washington	West Virginia	Wisconsin	Wyoming	

No data

Accordion





Other Toplo Improvements

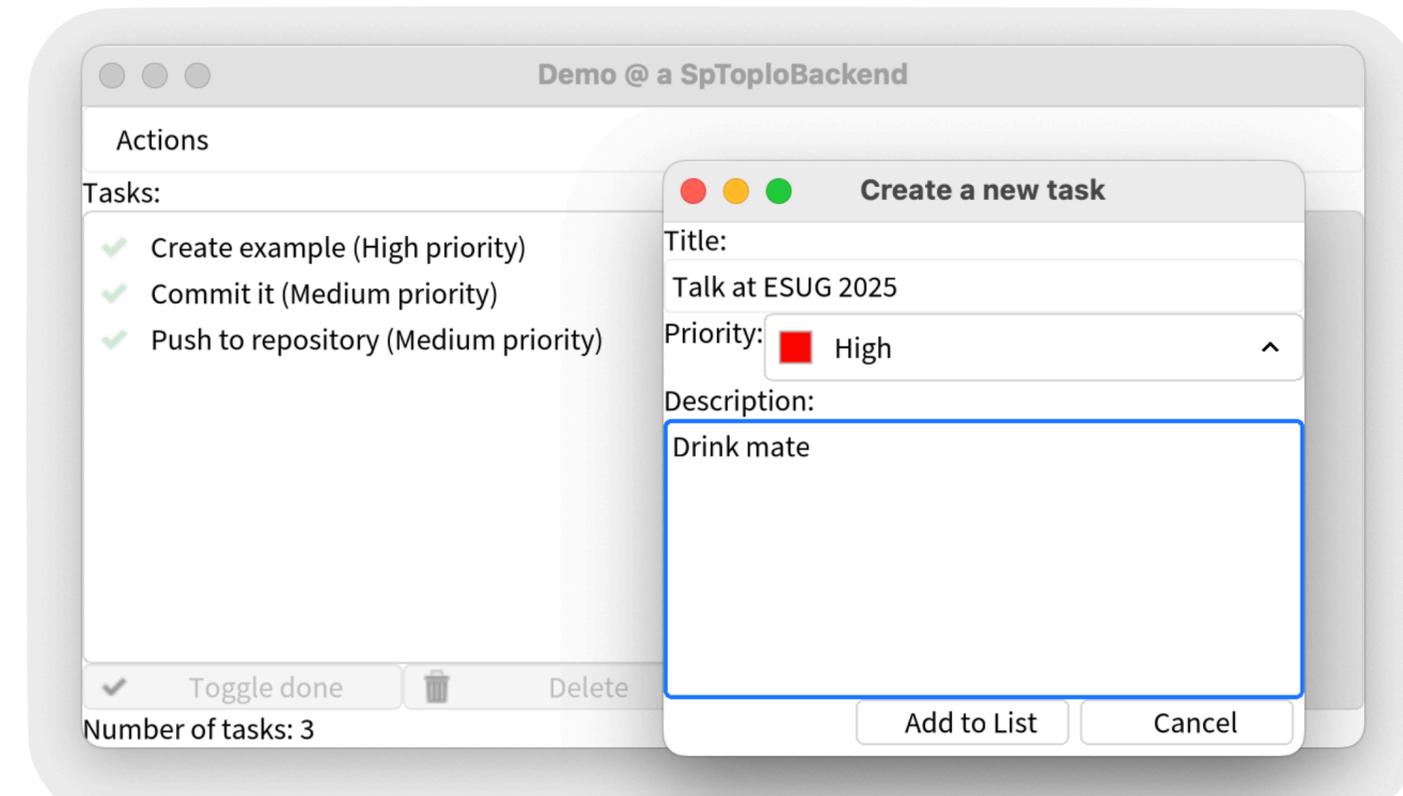
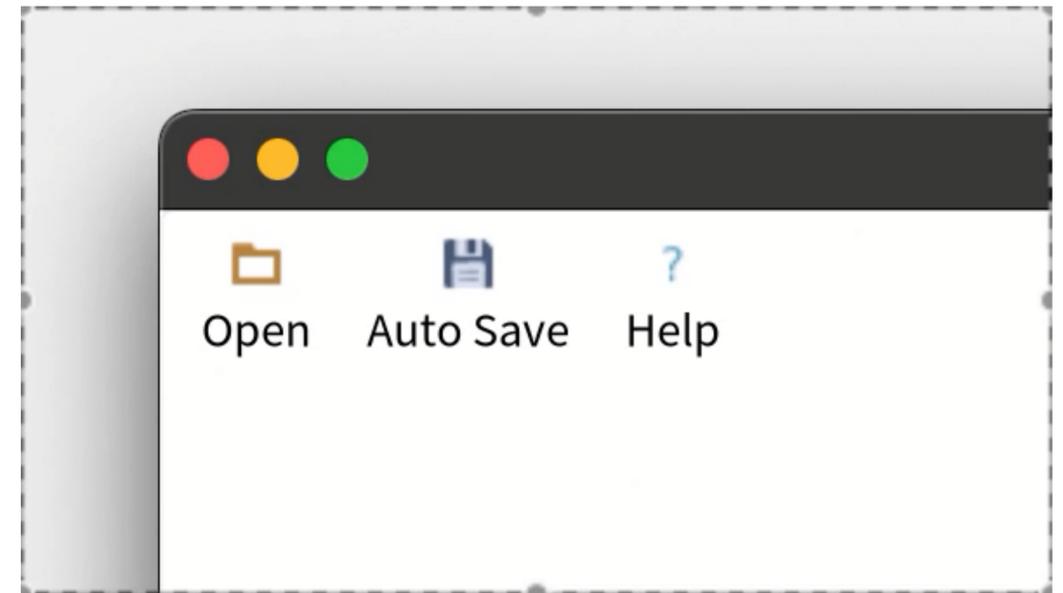
- Cleaning
- Bugfixing
- Progress Bar
- Improving Performance in Lists
- Tag Element
- Tree
- Improvements in Selection Modes
- Improvements in Skins
- Overlays

~1000 Commits
7 Contributors

Spec-Toplo

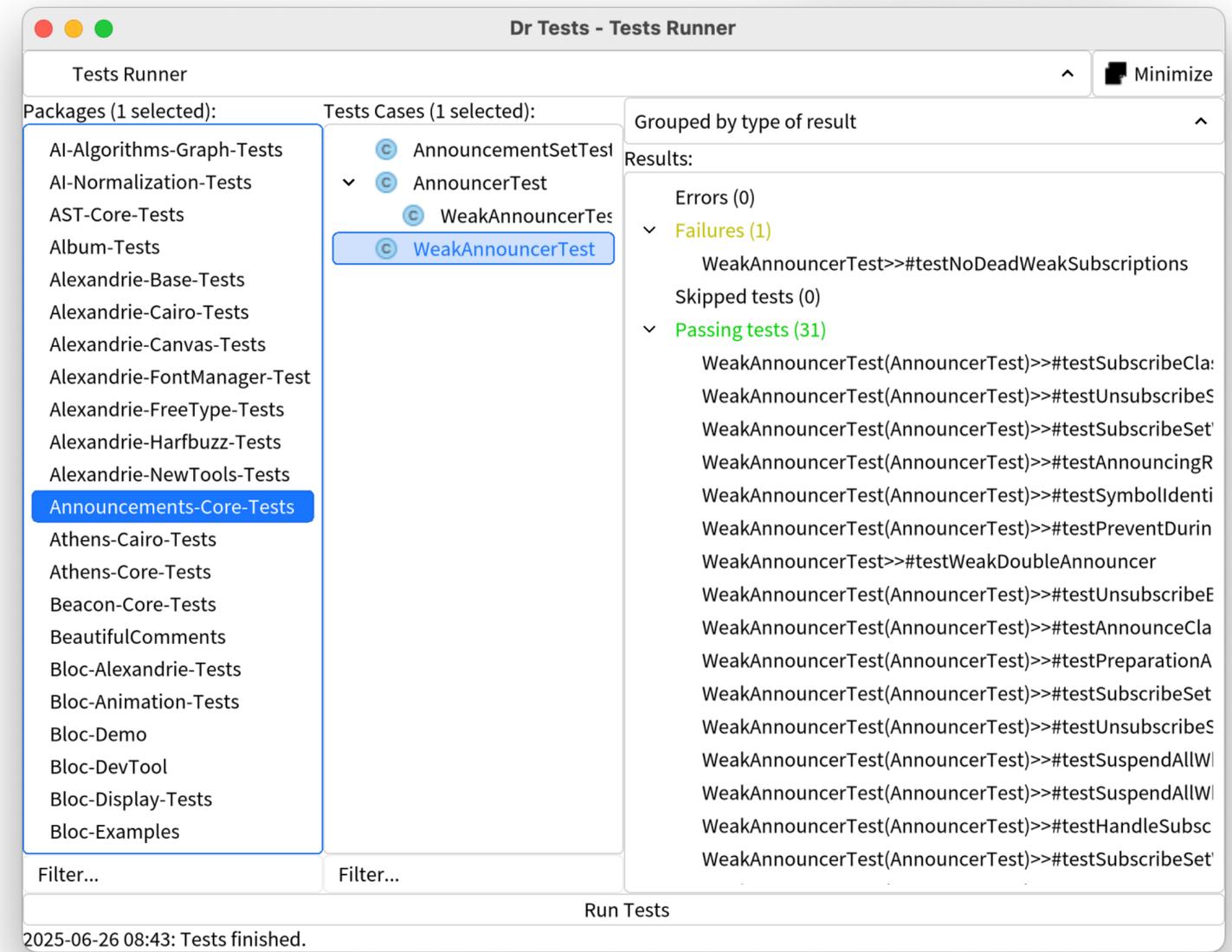
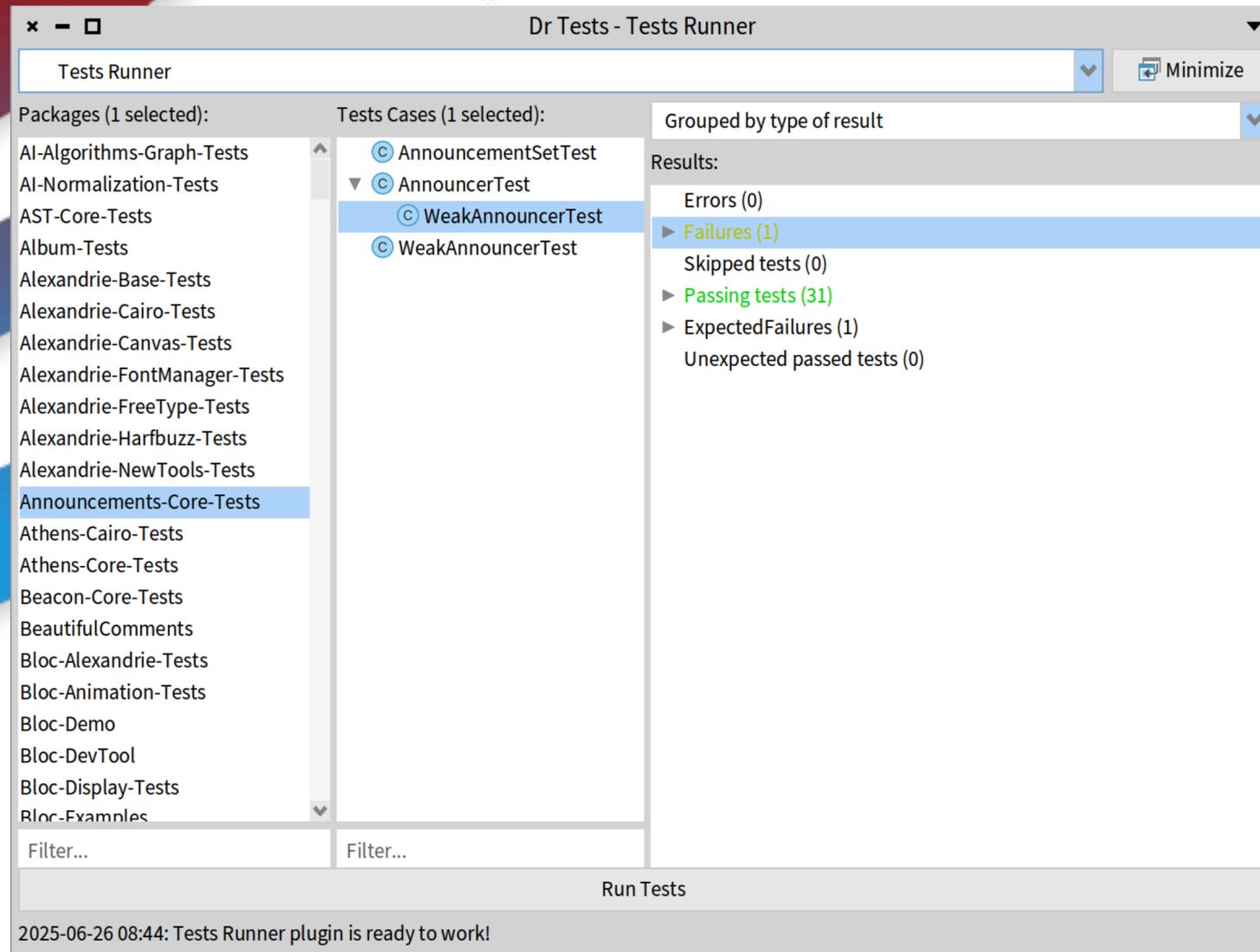
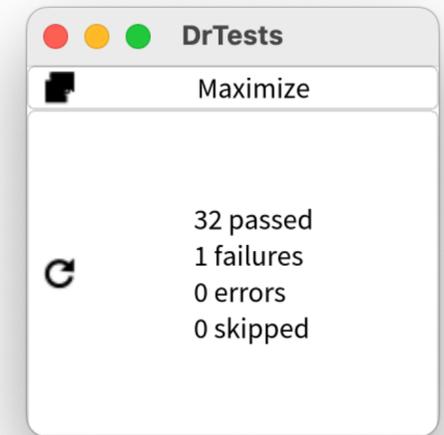
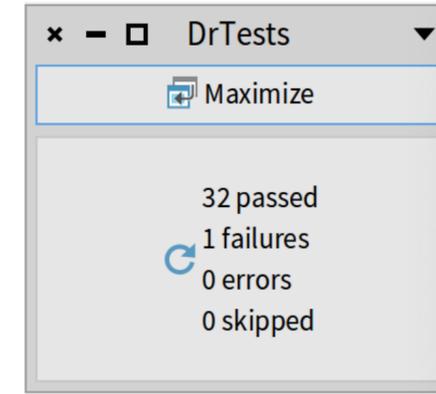
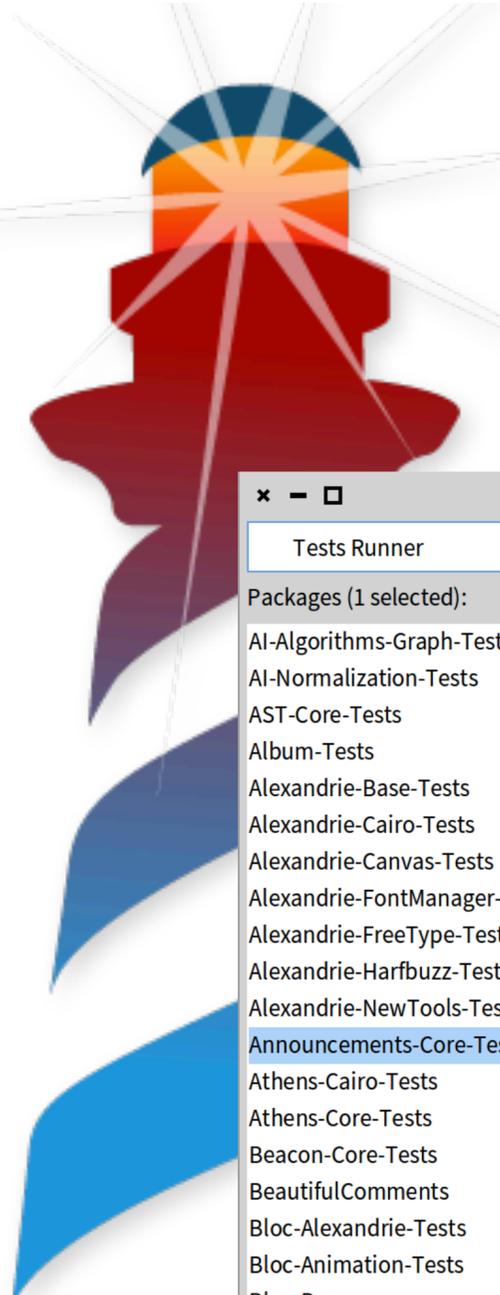
More Widgets in Spec-Toplo

- Tree
- Toolbar
- Menus
- Password text field
- Dropbox icons



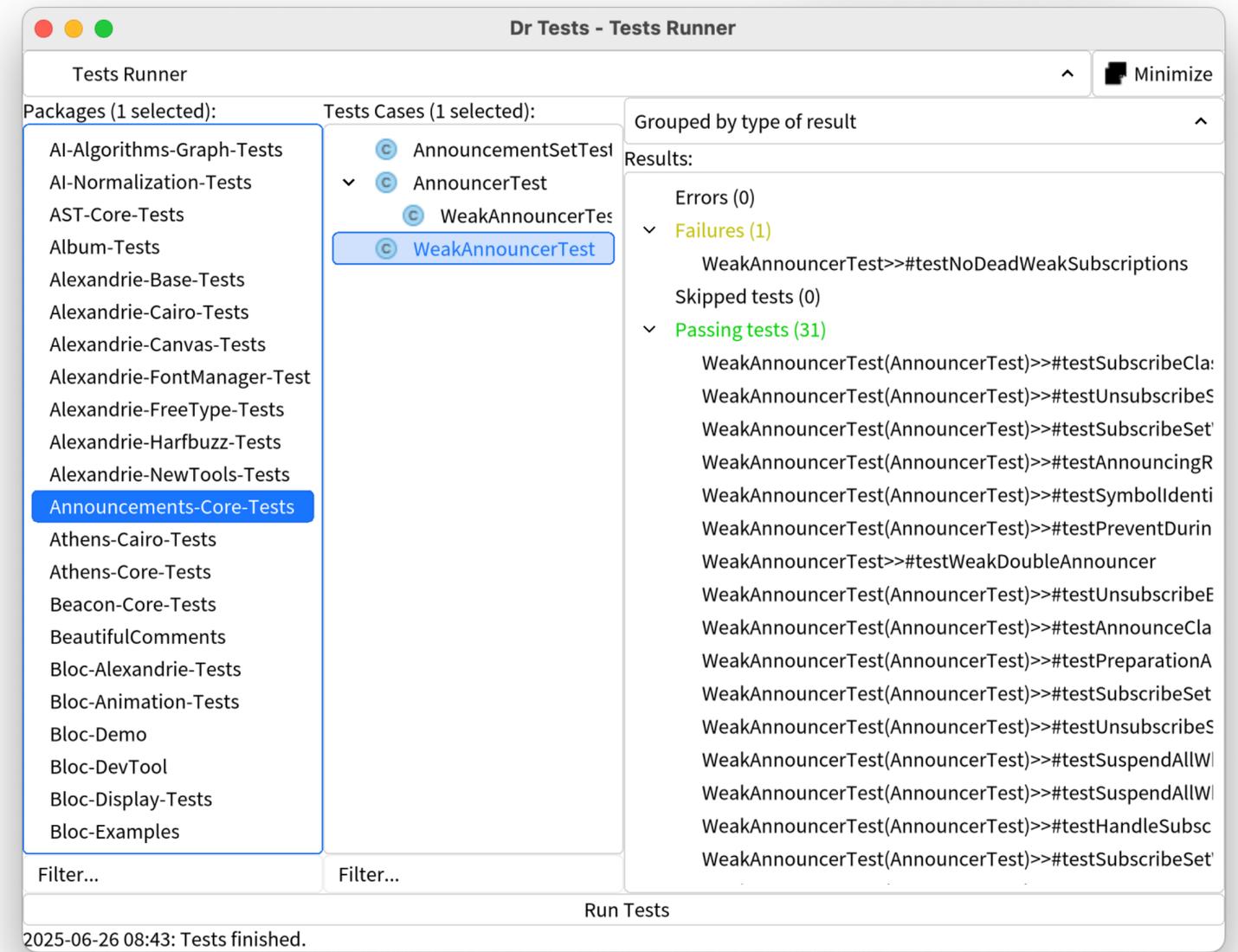
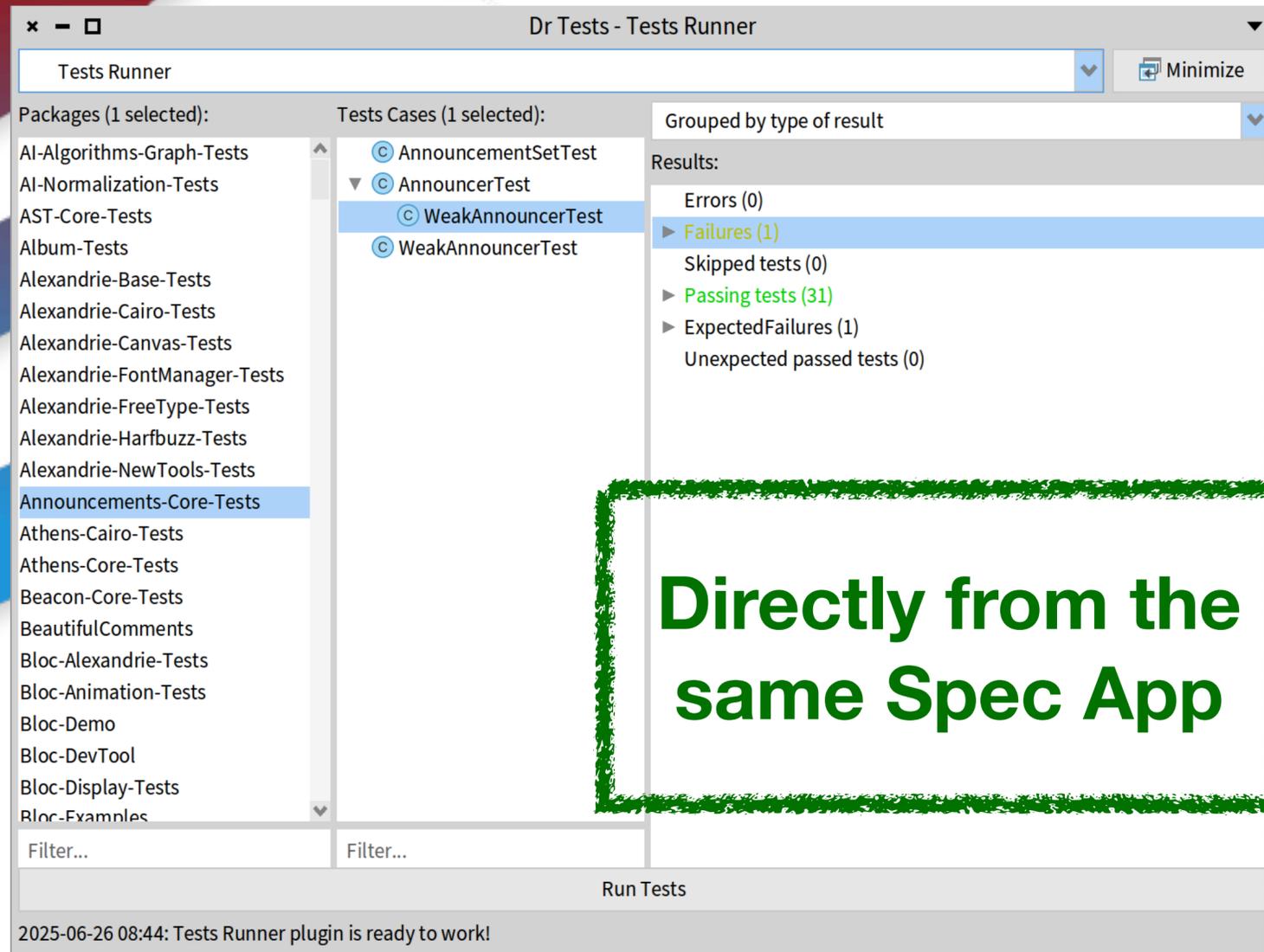
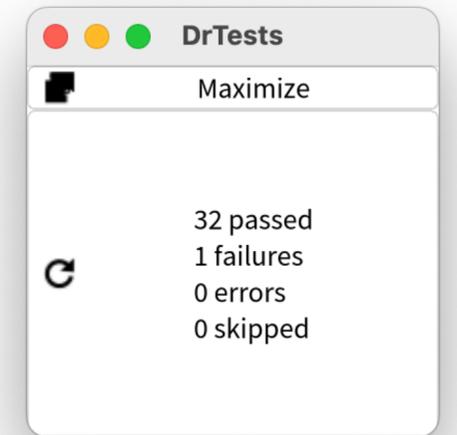
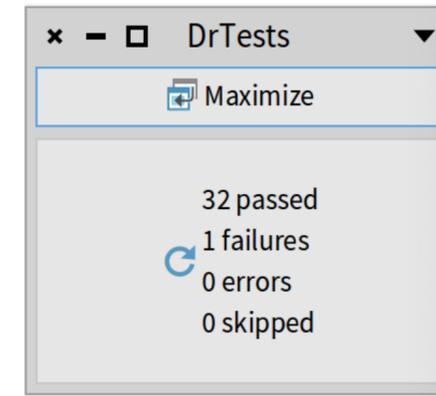
Pharo Tools in Toplo

We can eat our own food



Pharo Tools in Toplo

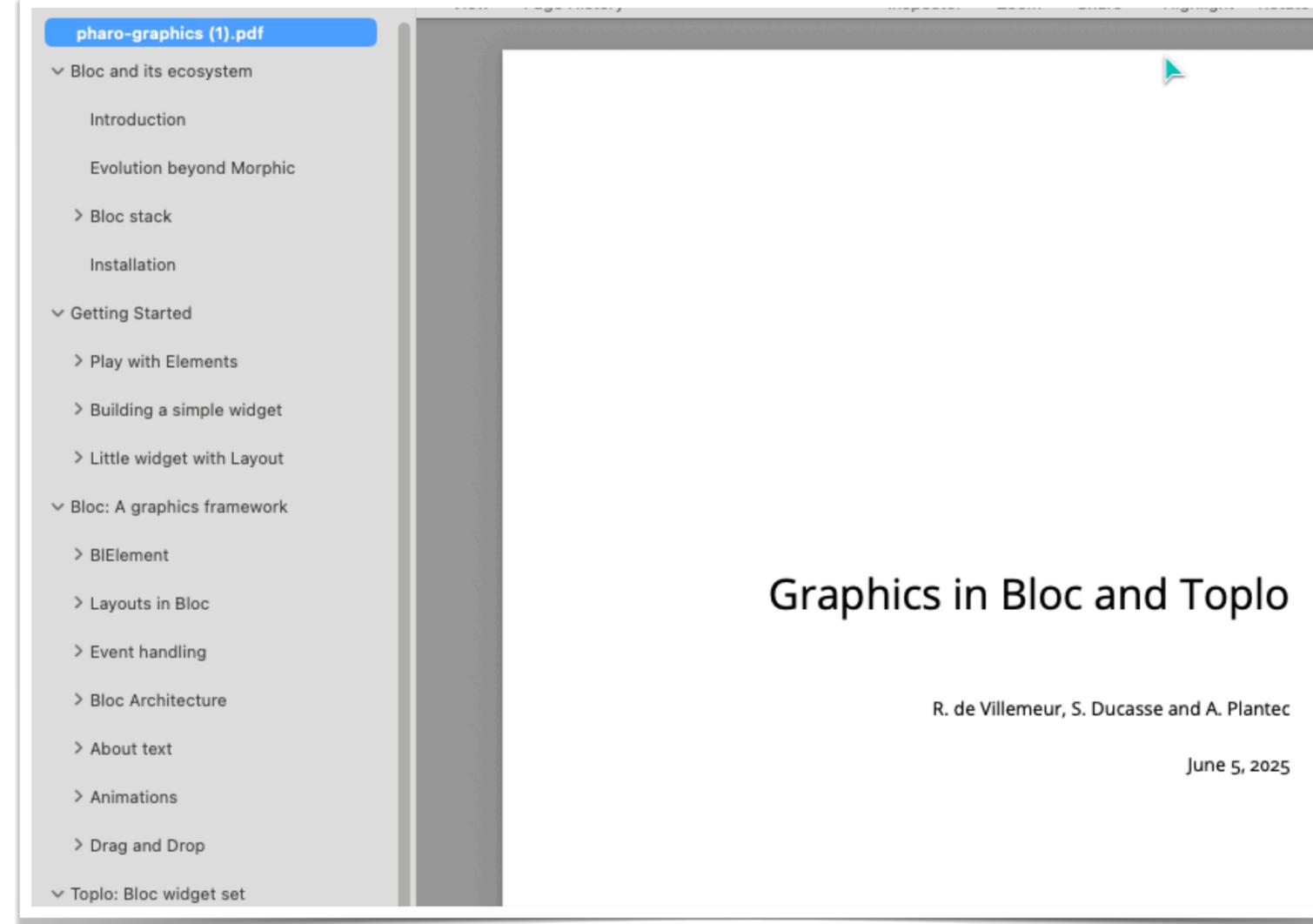
We can eat our own food





More and More....

- SDL2
 - Updated to latest version
 - Contributing / Bug-fixing
- SDL3
 - New Bindings (thanks CIG)
 - Future Backend
- Documentation Booklet <https://github.com/SquareBracketAssociates/Booklet-Graphics>





Future

We keep the same objectives

- Faster & More Stable Bloc
- More Widgets in Toplo
- Full Implementation of Spec-Toplo
- More Pharo Tools in Spec-Toplo
- Tests & Documentation



**STAY
TUNED!**

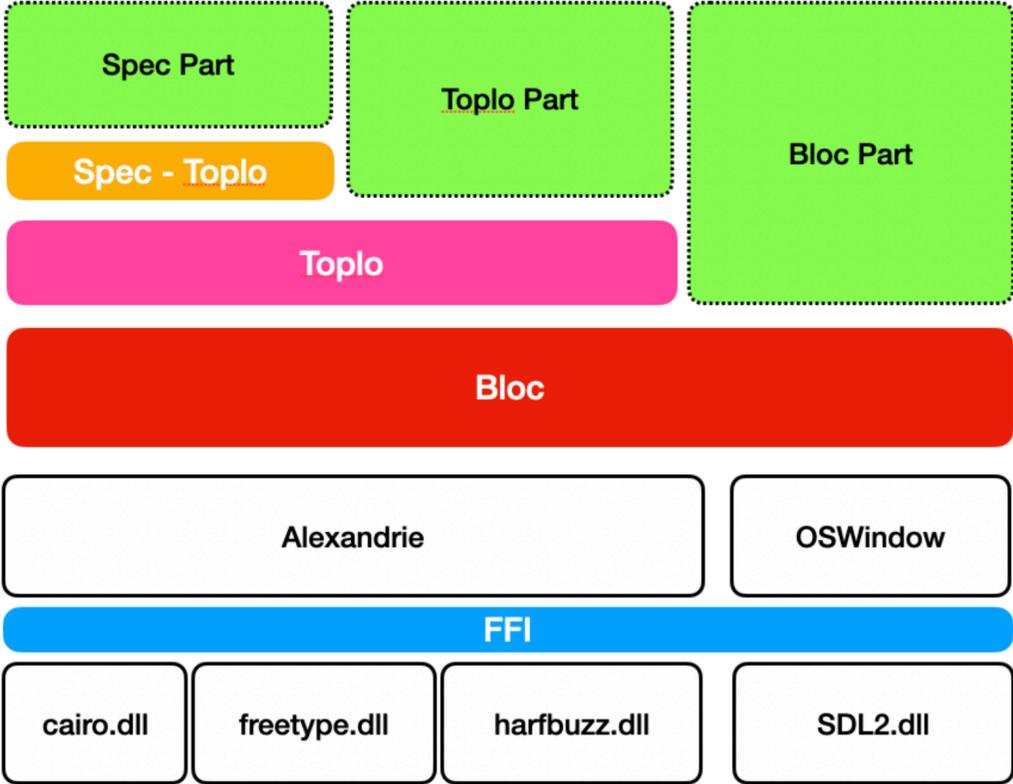
Mailing-list: lse-openbloc@inria.fr
(subscribe at: <http://sympa.inria.fr>)

Discord: Pharo server / #bloc channel

Bloc: <https://github.com/pharo-graphics/Bloc>

Toplo: <https://github.com/pharo-graphics/Toplo>

Spec-Toplo: <https://github.com/pharo-graphics/Spec-Toplo>



**Check Released
Versions!!!**

