Building real-life applications with Spec and GTK



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What is Spec?

(Last time we talked about this was 2020, you may have forgotten about it ;)

Spec is a framework in Pharo for describing user interfaces

- Fits for a wide range of UIs

Most Pharo tools are written in Spec

- Fundamental principle behind Spec:

Reuse of UI logic and its visual composition

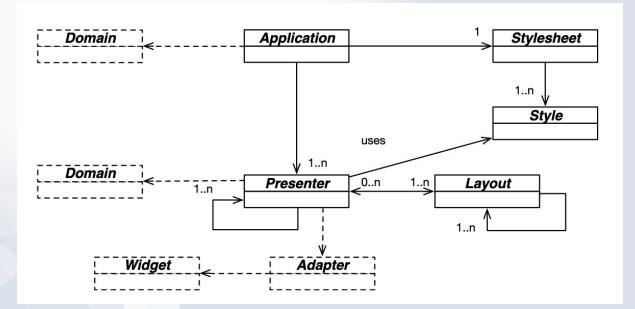
=> User interfaces are built by reusing and composing existing UIs, and configuring them as needed





Spec overview

A framework in Pharo for describing User Interfaces





Write once in Spec, run on many backends

- Write your app once in Spec
- Will then be runnable on Morphic, GTK, Toplo

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Add film				
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Schindler's L	ist	Steven Spielberg	1993	
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Name	E.T.			
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Schindler's	List	Steven Spielberg	1993		
E.T.		Steven Spielberg	1982		
Name	E.T.				
Director	Steven Spielberg				
Year	1982				+

pharo.org

By the way, last screenshots were made like this:

```
items := {
   { 'Schindler''s List'. 'Steven Spielberg'. 1993 }.
   { 'E.T.'. 'Steven Spielberg'. 1982 }.
1.
presenter := SpPresenter new.
presenter application: (SpApplication new useBackend: #Gtk).
toolbar := presenter newToolbar.
toolbar add: (presenter newToolbarButton
   icon: (presenter iconNamed: 'add');
   label: 'Add film';
   yourself).
list := presenter newTable
   items: items;
   addColumn: (SpStringTableColumn title: 'Name' evaluated: #first);
   addColumn: (SpStringTableColumn title: 'Director' evaluated: #second);
   addColumn: (SpStringTableColumn title: 'Year' evaluated: #third);
   yourself.
nameText := presenter newTextInput.
directorText := presenter newTextInput.
yearNumber := presenter newNumberInput.
```

```
nameText := presenter newTextInput.
directorText := presenter newTextInput.
yearNumber := presenter newNumberInput.
```

```
list transmitDo: [ :anArray |
    nameText text: anArray first.
    directorText text: anArray second.
    yearNumber number: anArray third ].
```

presenter layout: (SpBoxLayout newVertical add: toolbar expand: false; add: list; add: (SpGridLayout build: [:builder | builder beColumnNotHomogeneous; column: 2 withConstraints: [:c | c beExpand]; add: 'Name'; add: nameText; nextRow; add: 'Director'; add: directorText; nextRow; add: 'Year'; add: yearNumber; nextRow]); yourself).

pharo.org

```
presenter asWindow
  title: 'Mini IMDB';
  initialExtent: 600@400;
  open.
```

(I am not saying you have to do it in the same way, but is nice to see how scriptable Spec is)

What is GTK?

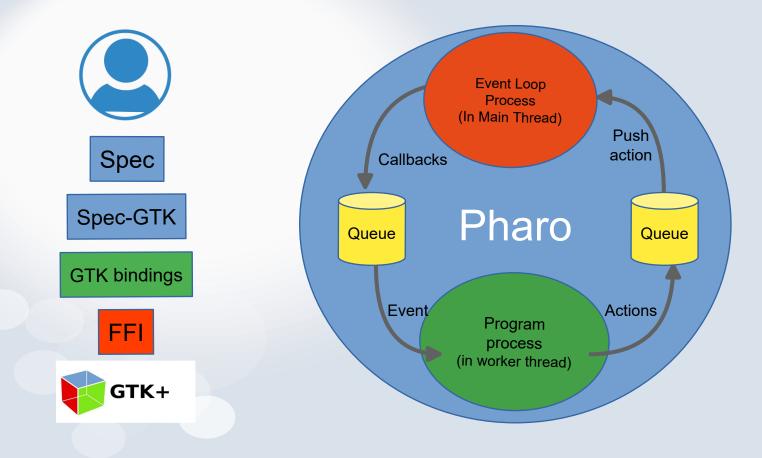
https://www.gtk.org/



- Rich set of Widgets
- Cross-Platform: Linux, Windows, and macOS
- FOSS: Free Open Source Software
- Written in C: Easy FFI integration
- Trivia: It means "GIMP Toolkit" (not "Gnome Toolkit")



GTK support overview





Why GTK4?

- New stable, lot of improvements.
- Improved List, Table and Tree widgets.
- Many available libraries:
 WebKitGTK, Vte, etc.





Worker mode

- The VM need to run in "worker mode"
- Forced separated UI thread and logic thread
- Allow real *idle* process





Demo - Pharo Launcher on GTK

Same app as Pharo Launcher on Morphic

- Already written in Spec
- It requires L&F enhancements (available for both backends)
- Specific styling for GTK

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Pharo Launcher now



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pharo-test-cmd	64	100	5 months ago
Moose Suite 10 (development)	64	100	more than a year ago

pharo12 image, last edited 2024-06-12T22:26:57+02:00

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Origin template	unknown
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Initialization script	<none></none>
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Moose Suite 10 (development)

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This happened after running Pharo Launcher in Spec-GTK the first time...



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And this is how it looks now



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The importance of design

UX is important Blocking processes are dangerous!

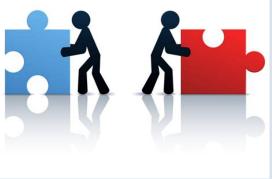
Bad UX	Good UX
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Separation between UI and program logic

 Forced separation between UI and program logic helps, but you still can do a mess

- e.g. executing heavy processes inside a callback
- like filling a list that needs to be downloaded from the internet





Packaging of a Spec-GTK application



How to distribute my application written in Spec with GTK backend?

 reuse guidelines presented at ESUG'23: <u>https://youtu.be/iYGnb1oVosU</u>

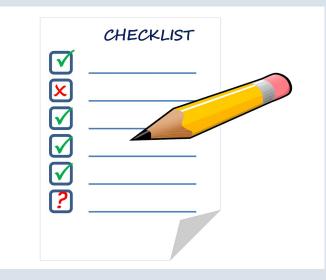


- GTK-specific:
 - > Need to embed GTK libs with the Pharo VM (Windows, Mac Os)



Application check list

- Spec-GTK is there to help
- DO NOT block the UI thread
- Think about UX





Future

Release of Pharo Launcher GTK

- Application Builder (automate packaging)
- Enhance tools for better experience when working on GTK
- better debug when inside a callback (not easy)

but you should not be in a callback!





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2024-06-28 10:49:19	https://files.pharo.org/get-files/110/pharo-vm-Linux-x86_64-stable.zip	2
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Last modified: 5 months ago

Important changes in Spec-Gtk

From user point of view: You have nothing to do.

- List / Table / Tree
- New GTK widgets (GtkListView, GtkColumnView) use a more efficient pattern (same as morphic Fast Table, in fact).
 Important for Pharo because it reduces the amount of Thread jumps.
- New SpListViewPresenter and SpColumnViewPresenter can receive any presenter as content (not a subset of column types as before).

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Contextual menus

- The old way to declare context menus and shortcut bindings was not satisfactory at all (a lot of duplicated code)
- Blocks for doing better were already there (commander)



Spec UI example (Morphic backend)

	Mini IMDB		×
+ Add film			
Name	Director	Year	
Schindler's L	ist Steven Spielberg	1993	
E.T.	Steven Spielberg	1982	
Name	E.T.		
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