Reproducible moldable interactions

Master Thesis

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Motivation

DEMO
Motivation

- Sessions are lost on closing
- Sessions cannot be replayed
- Code has to be manually extracted from a session
- Demoing session requires external tool support
Motivation

Persisting inspection sessions

Replaying entire sessions

Generating code

Creating movie-like tutorials
Approach 1: UI recording
Inspector on a WorldMorph(562956288) [world]

```
self
```

```
"a WorldMorph(562956288) [world]"

self
```
Record click: 200@100
Record click: 200@100
Record click: 150@300
Record click: 200@100
Record click: 150@300
Record click: 400@400
Record click: 200@100
Record click: 150@300
Record click: 400@400
Record click: 450@100
Record click: 200@100
Record click: 150@300
Record click: 400@400
Record click: 450@100
Record click: 500@200
Persist clicks
easy to record
easy to replay

hardcodes position
not implementable in a generic way

Persist clicks
Approach 2: Serialization
FLSerializer serializeToByteArray:anInspector.
inspector-{timestamp}.fuel
FLSerializer serializeToByteArray:anInspector.
inspector-{timestamp}.fuel
inspector-{timestamp}.fuel
inspector-{timestamp}.fuel
inspector-{timestamp}.fuel
inspector-{timestamp}.fuel
independent of UI
easy to implement
duplicated information
inflexible and brittle

FLSerializer serializeToByteArray:anInspector.
inspector-{timestamp}.fuel
inspector-{timestamp}.fuel
inspector-{timestamp}.fuel
A moldable approach
Record click: 150@300
Click events

childAt: 4
Click events

childAt: 4
childAt: 1
Click events

childAt: 4
childAt: 1
childAt: 3
Click events

childAt: 4
childAt: 1
childAt: 3
childAt: 1
Click events

- `childAt: 4`
- `childAt: 1`
- `childAt: 3`
- `childAt: 1`

Persist UI element path
Click events

- childAt: 4
- childAt: 1
- childAt: 3
- childAt: 1

Persist UI element path

CSS: n-th child
Click events

submorphAt: 4
Click events

submorphAt: 4
childAt: 1
Click events

submorphAt: 4
childAt: 1
tabAt: 3
Click events

- submorphAt: 4
- childAt: 1
- tabAt: 3
- paneAt: 1
<table>
<thead>
<tr>
<th>Raw</th>
<th>Extension</th>
<th>Submorphs</th>
<th>Morph</th>
<th>Keys</th>
<th>Meta</th>
</tr>
</thead>
<tbody>
<tr>
<td>a WorldMorph(562956288) [world]</td>
<td>a GLMSystemWindow(647852096)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a TaskbarMorph(804941096)</td>
<td>a GLMSystemWindow(2664931392)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a GLMSystemWindow(1057171200)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Click events
- submorphAt: 4
- childAt: 1
- tabAt: 3
- paneAt: 1

Persist customized UI element path
Click events

submorphAt: 4
childAt: 1
tabAt: 3
paneAt: 1

Persist customized UI element path

fallback to childAt: if no customization available
submorphAt: 4
SubmorphSelection: 4
SubmorphSelection: 4
AttributeSelection: #model
SubmorphSelection: 4
AttributeSelection: #model
PresentationSelection: ‘Ports’
SubmorphSelection: 4
AttributeSelection: #model
PresentationSelection: ‘Ports’
SubmorphSelection: 4
AttributeSelection: #model
PresentationSelection: ‘Ports’
PortSelection: #text
SubmorphSelection: 4
AttributeSelection: #model
PresentationSelection: ‘Ports’
PortSelection: #text
AttributeSelection: #value
SubmorphSelection: 4
AttributeSelection: #model
PresentationSelection: ‘Ports’
PortSelection: #text
AttributeSelection: #value
We need here a plus/minuses slide
SubmorphSelection: 4

AttributeSelection: #model

PresentationSelectionAction

CollapseAction

HideAction

PresentationSelectionAction
Moldable recording infrastructure
(directly inside the UI framework)
Moldable recording infrastructure (directly inside the UI framework)
FolderSelection: main

ArchiveSelection: archive.zip

FileInArchiveSelection: pharo-city.png
CategorySelection: Mondrian

ExampleSelection: InnerAndPopup

MethodSelection: RTArc>>#initialize
glamourModel := MooseModel root allModels detect: [ :each |
    each name = 'GlamourModel' ].

actionClass := glamourModel allModelClasses detect: [ :each |
    each name = 'GLMAction' ].

methods := actionClass methods select: [ :m |
    m outgoingInvocations size > 0 ]
Moldable recording infrastructure
(directly inside the UI framework)
Moldable recording infrastructure
(directly inside the UI framework)
Current state

DEMO
Future work

- Custom recording steps
- Integration in the inspector
- Experimental scenarios (snapshot, movie, code generation)
- Thesis writing
Challenges

- Pharo/Bloc
- Complete redesign of the Inspector
- Usability
- Thesis writing
Manually redoing inspection sessions makes developers waste time during development.

Allow graphical objects to decide how interactions will be recorded (fall back to #childAt:).