

# Everything You Ever Wanted to Do With Clutter\* (\*But Were Afraid to Ask)

Neil Roberts, Damien Lespiau, Chris Lord - GUADEC 2010



# Dax - A Clutter based SVG library

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## SVG

```
<?xml version="1.0"?>  
<svg width="256" height="192"  
  <circle cx="100" cy="100" r="20" fill="orange" />  
</svg>
```





SVG can draw lions...



...and tigers

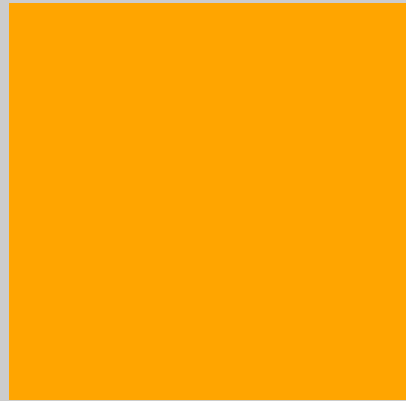
# SVG is not just about drawing wild animals

- Styling with CSS,
- SVG fonts,
- Events (pointer, keyboard, focus, ...),
- SMIL Animations,
- JavaScript & ( $\mu$ )DOM,
- `<audio>` and `<video>` tags.

# Putting things together

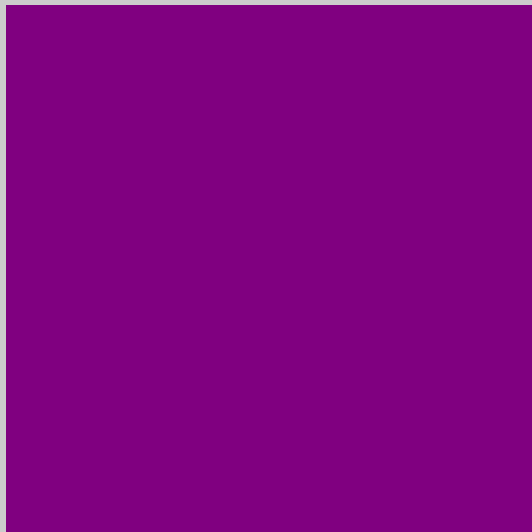
- gobject-based DOM tree,
- gobject-introspection (DOM API),
- gjs (or seed),
- Clutter,



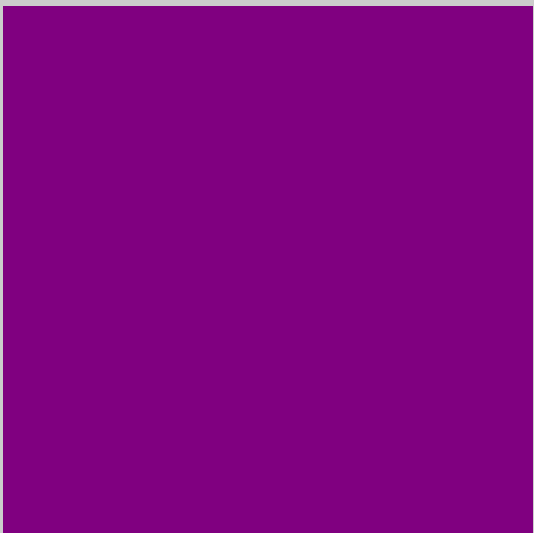
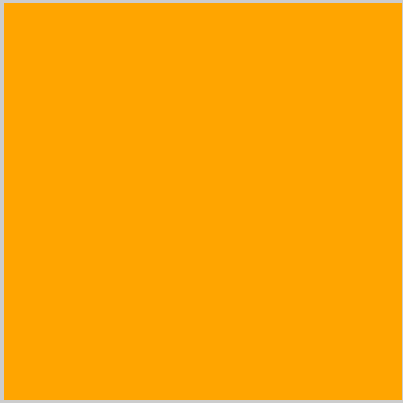


## Animations (1)

```
<rect x="10" y="10" width="48" height="48" fill="orange">  
  <animate attributeType="XML" attributeName="x"  
    from="10" to="190" dur="4s" repeatCount="indefinite" />  
</rect>
```



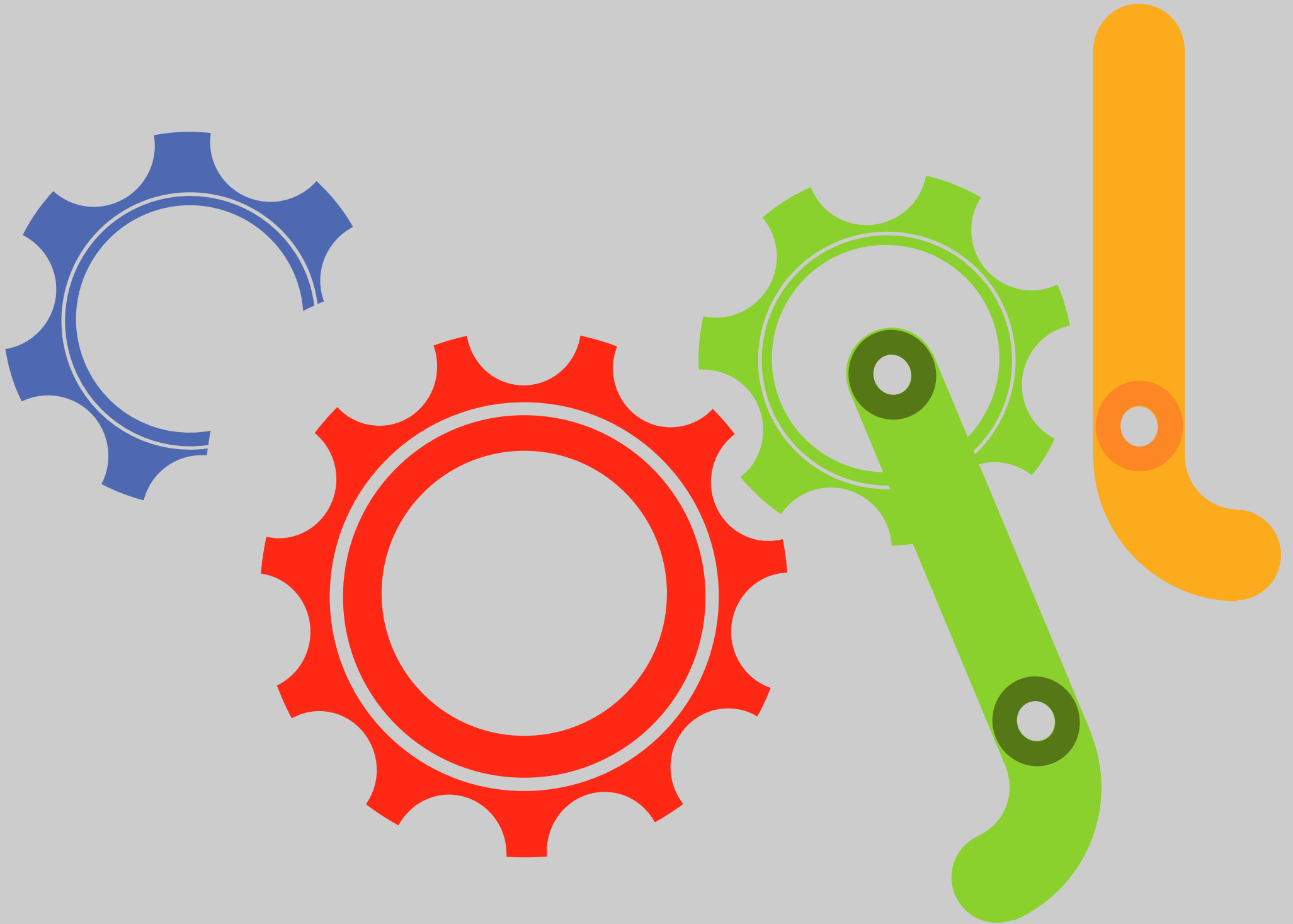




The background features a light gray gradient with several stylized, semi-transparent gears in blue, red, and green. On the right side, there are vertical orange and yellow shapes, including a rounded rectangle and a circle. A dark gray rectangular box is centered on the page, containing text.

## Animations (2)

```
<animateTransform attributeName="transform"  
type="rotate" from="0" to="360" dur="15s"  
repeatCount="indefinite"  
xlink:href="#letter-o" />
```



## Events, JavaScript

```
<script type="application/ecmascript"><![CDATA[
  function circle_click(evt) {
    var circle = evt.target;
    var currentRadius = circle.getFloatTrait("r");
    if (currentRadius == 100)
      circle.setFloatTrait("r", currentRadius*2);
    else
      circle.setFloatTrait("r", currentRadius*0.5);
  }
]></script>
<circle cx="300" cy="225" r="100" fill="red">
  <handler type="application/ecmascript" ev:event="click">
    circle_click(evt);
  </handler>
</circle>
```



## Video tag

```
<video xlink:href="video.avi" audio-level=".8"  
  type="video/x-msvideo"  
  x="50" y="50" width="320" height="240"  
  repeatCount="indefinite"/>
```





## Where is this going?

- Growing high level XML library,
- Drawing work (stroking, gradients, cairo),
- Authoring tool needed,
- HMTL 5 experiments,
- Own time project.







Think Clutter!

Toolkits, Flash, SVG,  
CSS3, MPEG4 BIFS & LaSeR

clutter

## Links

- Dax repo: <git://git.clutter-project.org/dax>
- Temporary Clutter branch: <git://git.lespiau.name/clutter-guadec>
- Slides: <git://git.lespiau.name/2010-GUADEC>
- Pinpoint: <git://git.clutter-project.org/toys>





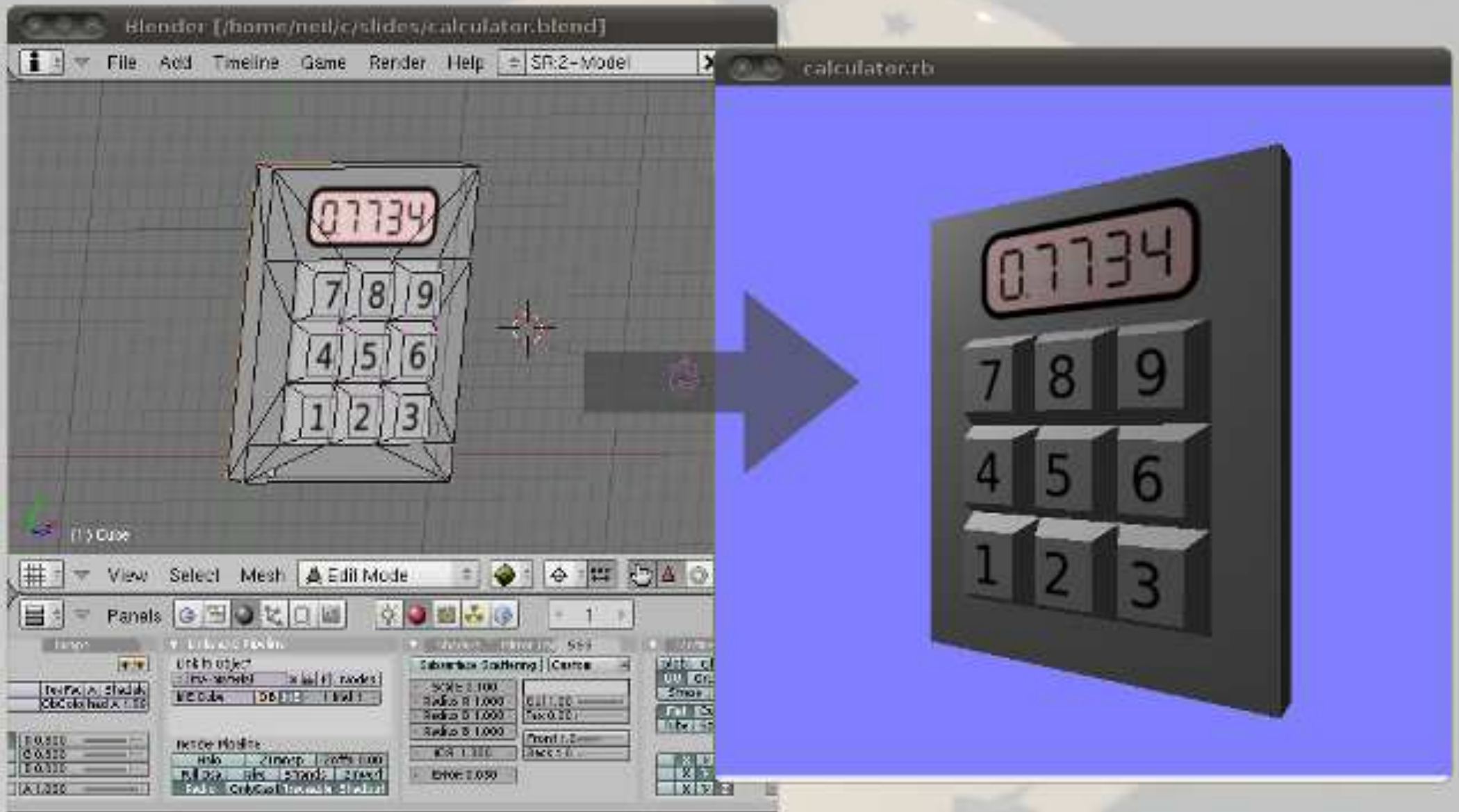
علی

mash





A library for putting 3D models in a Clutter scene



Make actors out of models drawn in Blender

A top-down view of a white ceramic bowl filled with yellow mashed potatoes. The bowl's rim is decorated with a pattern of dark blue stars of varying sizes. The bowl sits on a dark, textured surface. A black horizontal bar with white text is overlaid across the middle of the bowl.

Uses Stanford PLY format via library called RPly

A top-down view of a white ceramic plate with a decorative border of dark blue stars. The plate is filled with a mound of light-colored, fluffy mashed potatoes. A black horizontal bar with white text is overlaid across the center of the plate.

Blender has a builtin exporter for PLY files



```
require 'mash'

Clutter::init
stage = Clutter::Stage.get_default
stage.color = Clutter::Color.new(128, 128, 255, 255)

# Create an actor for the model
model = Mash::Model.new(Mash::Data::NEGATE_Y, "example-model.ply")

# Set a size and position. By default the model gets scaled to fill
# this size while preserving the aspect ratio
model.set_size(stage.width * 0.6, stage.height * 0.6)
model.set_position(stage.width / 2 - model.width / 2,
                  stage.height / 2 - model.height / 2)

# Add it to the stage
stage << model

# Run the main loop
stage.show
Clutter::main
```



It doesn't look like much without lighting

A yellow plate with several blue stars of varying sizes scattered across its surface. The plate is centered in the frame against a dark background.

```
# Create a special container that enables lighting for its children
box = Mash::LightBox.new(Clutter::FixedLayout.new)
```

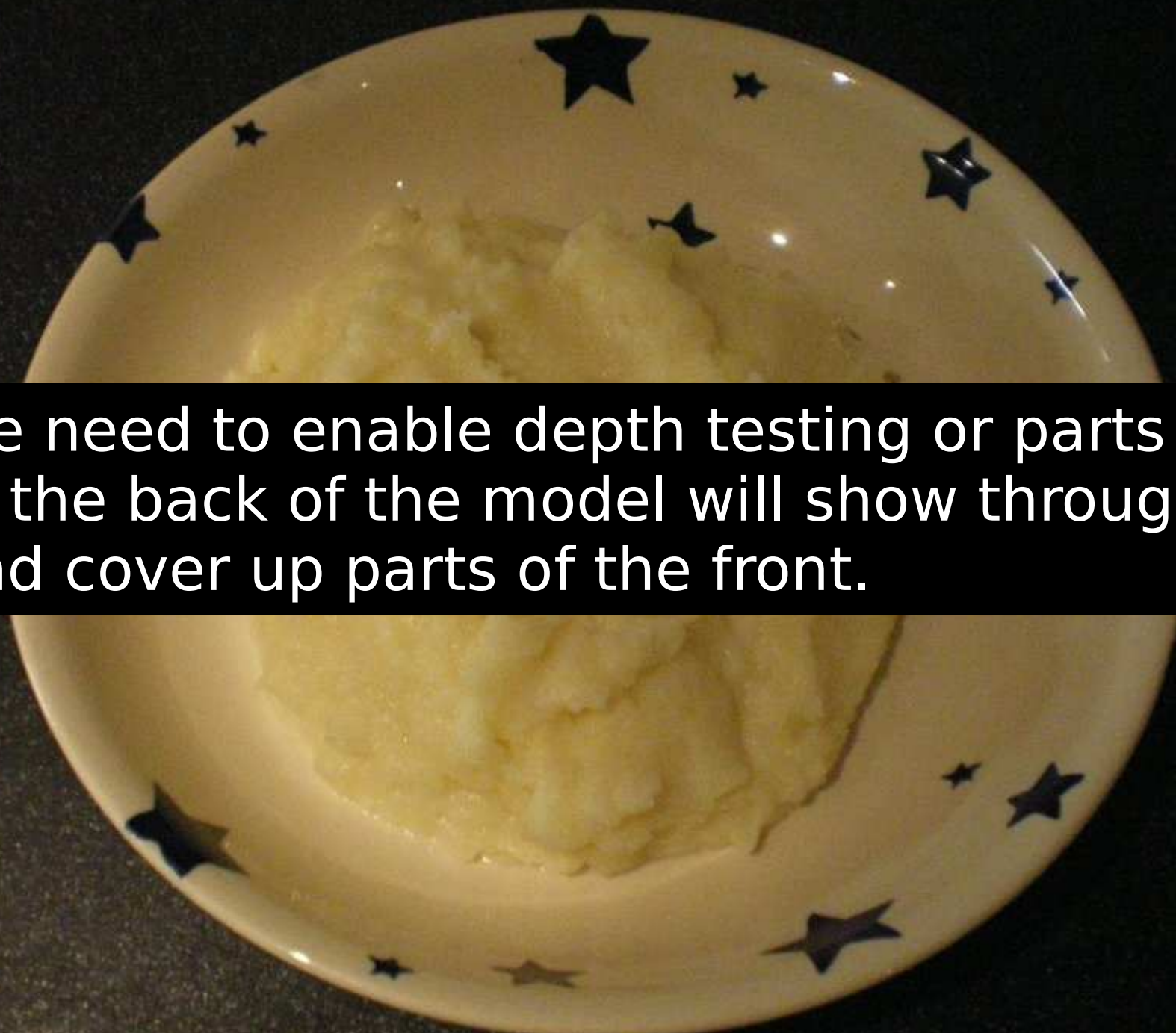
```
# Add a light to the scene
light = Mash::PointLight.new
light.x = stage.width
light.depth = 100
box << light
```

```
# We now put the model in the box as well instead of directly to the
# stage
box << model
```


```
# .. and add the box to the stage
stage << box
```



What happened to the eyes?

A white ceramic plate with a decorative border of blue stars of various sizes. The plate is filled with a yellowish, textured substance, possibly a food item like mashed potatoes or a model. A black text box is overlaid on the center of the plate.

We need to enable depth testing or parts of the back of the model will show through and cover up parts of the front.

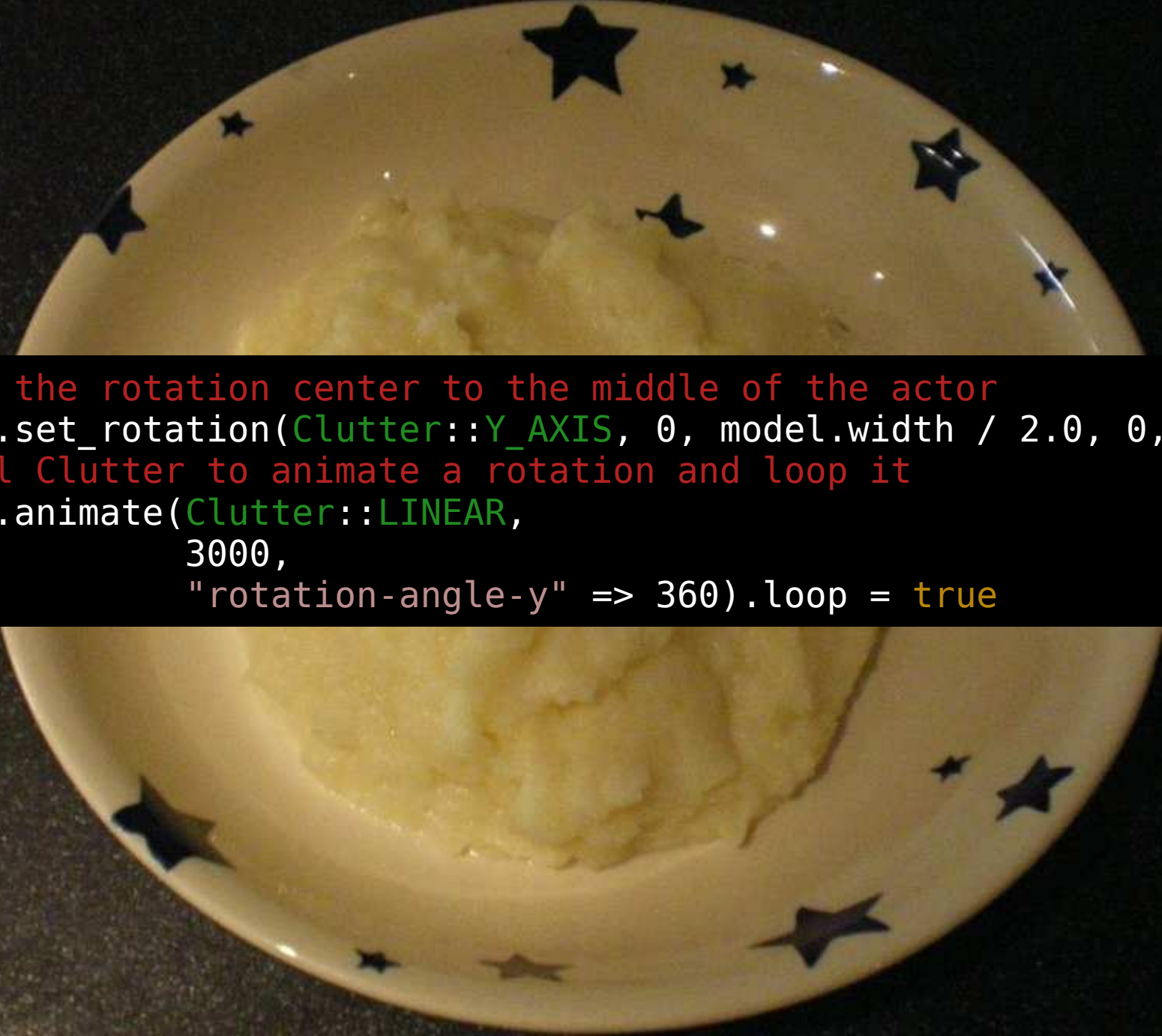


```
# Enable depth testing when the box is painted
box.signal_connect('paint') do
  Cogl.set_depth_test_enabled(true)
  # We can also enable backface culling for a free optimization
  Cogl.set_backface_culling_enabled(true)
end

# Disable it again after the paint depth testing when the box is painted
box.signal_connect_after('paint') do
  Cogl.set_depth_test_enabled(false)
  Cogl.set_backface_culling_enabled(false)
end
```



The model is an actor so we can use Clutter's animation framework with it

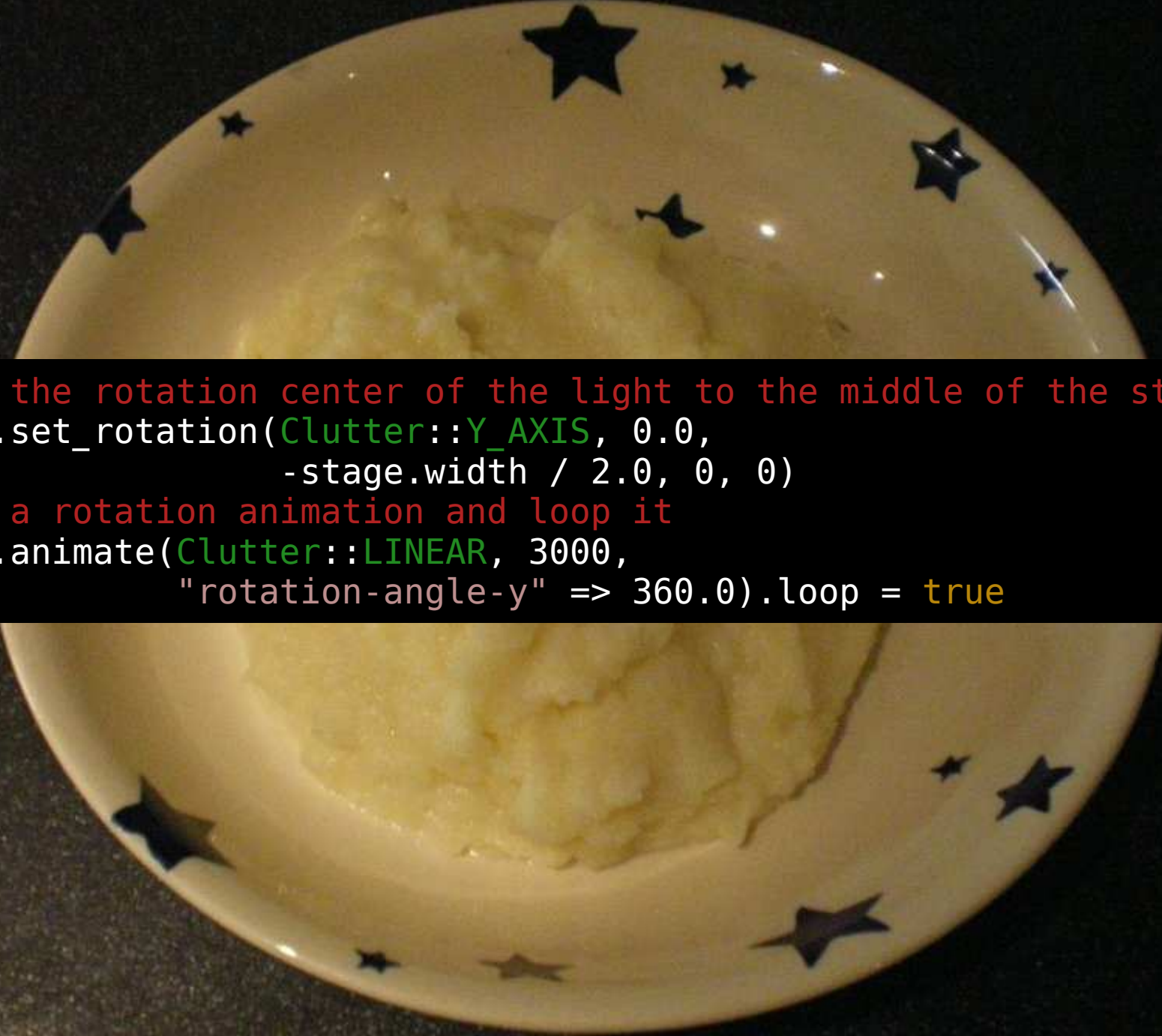


```
# Set the rotation center to the middle of the actor
model.set_rotation(Clutter::Y_AXIS, 0, model.width / 2.0, 0, 0)
# Tell Clutter to animate a rotation and loop it
model.animate(Clutter::LINEAR,
              3000,
              "rotation-angle-y" => 360).loop = true
```




A white ceramic plate with a decorative border of blue stars of various sizes. The plate is filled with a yellow, fluffy, and somewhat irregular substance, possibly a cooked egg or a soft food item. The background is dark and out of focus.


The lights are actors too so we  
can also animate those



```
# Set the rotation center of the light to the middle of the stage
light.set_rotation(Clutter::Y_AXIS, 0.0,
                  -stage.width / 2.0, 0, 0)
# Set a rotation animation and loop it
light.animate(Clutter::LINEAR, 3000,
              "rotation-angle-y" => 360.0).loop = true
```

A white ceramic plate with a decorative border of blue stars of various sizes. The plate is filled with a yellowish, textured substance, possibly mashed potatoes or a similar food item. A black rectangular box with white text is overlaid on the center of the plate.

If the model has texture coordinates  
then we can set a texture to draw



```
# Get the Cogl material from the model
material = model.material
# Set a texture layer on the material
material.set_layer(0, Cogl::Texture.new("dice-texture.png"))
```

A top-down view of a white ceramic plate with a decorative border of dark blue stars. The plate is filled with a mound of yellow, fluffy mashed potatoes. A black rectangular text box is overlaid on the center of the plate.

The Mash lighting model is directly copied from the old fixed function lighting model from OpenGL

A white ceramic plate with a decorative border of blue stars of various sizes. The plate is filled with a yellowish, textured substance, possibly mashed potatoes or a similar food. A black rectangular box is overlaid on the center of the plate, containing white text.

There are three light types

*MashDirectionalLight*

*MashPointLight*

*MashSpotLight*



What could it be used for?

A top-down photograph of a white ceramic plate with a decorative border of dark blue stars. The plate is filled with a serving of fluffy, yellow scrambled eggs. A black rectangular box with the word "Games" in white text is centered over the eggs. The background is a dark, textured surface.

Games





DFight

A top-down view of a white ceramic plate with a decorative border of blue stars. The plate is filled with a mound of yellowish, fluffy mashed potatoes. A black rectangular box with white text is centered over the potatoes.

Robot pony

A top-down view of a white ceramic plate with a decorative border of dark blue stars. The plate is filled with a mound of yellow, fluffy mashed potatoes. A black rectangular box is superimposed over the center of the plate, containing white text.

3D icons in a user interface?

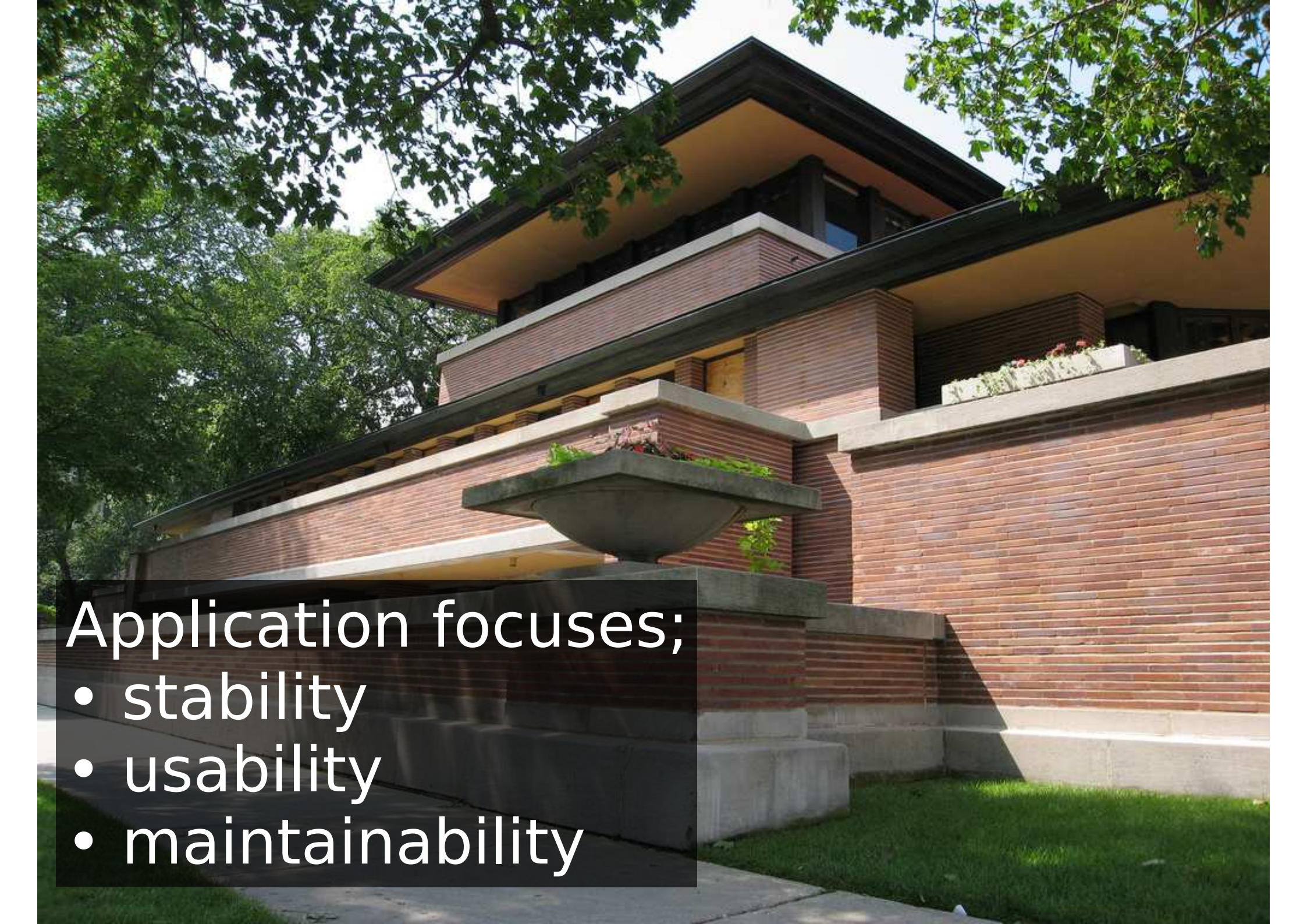


</presentation>

The angry cat picture is Copyright onefromme on Flickr and is released under the Creative Commons Attribution 2.0 Generic license

# Writing simple, real-time games using Clutter





Application focuses;

- stability
- usability
- maintainability



Game focuses;

- gameplay







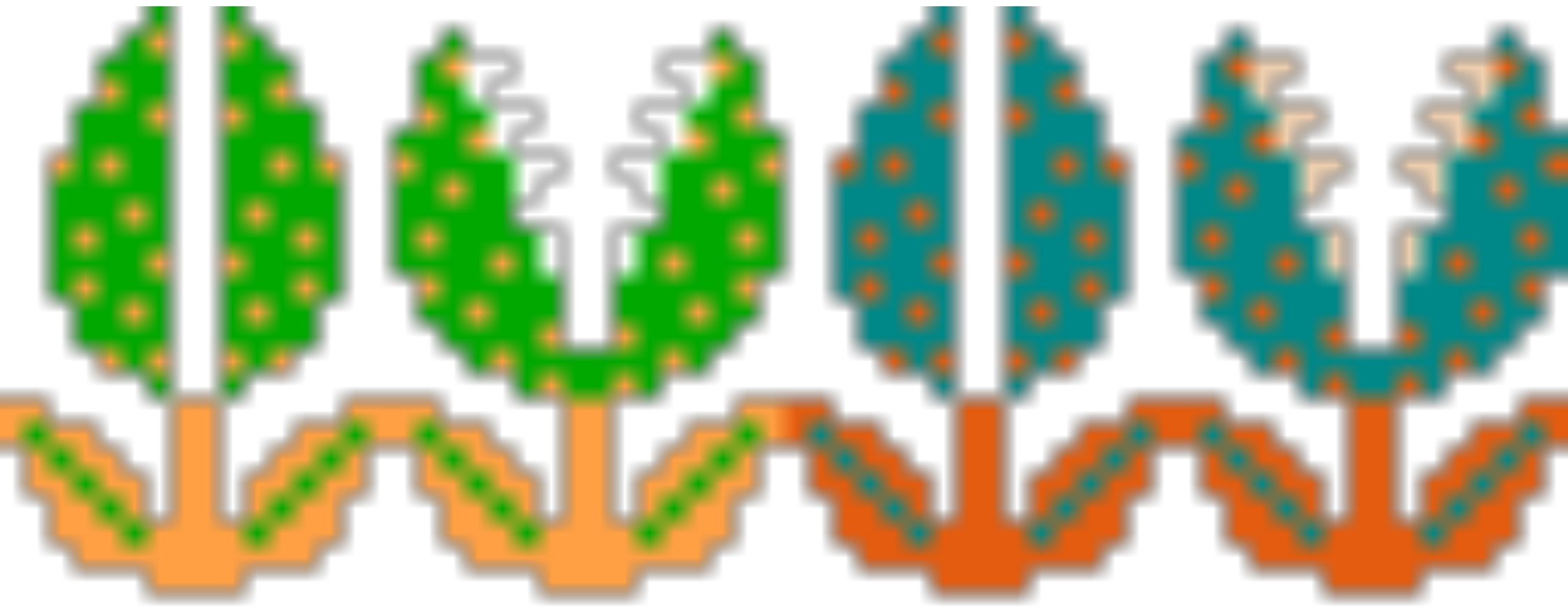
Game-writing guidelines  
"Lord's Laws"

# Law 1 - Steal





Law 2 - Take advantage of your software



Law 3 - Use images for everything



Law 4 - Keep it simple

# Law 5 - Quick and dirty



km/h

# Law 6 - Get help



The results:

PLACE  
STAMP  
HERE

GOOGLE  
CLASSIC

QUERY:

IMAGES  NEWS  VIDEO  MAPS  OTHER

SEND YOUR QUERY TO: GOOGLE INC., 1600 AMPHITHEATRE PARKWAY, MOUNTAIN VIEW, CA 94043, UNITED STATES

**PLEASE ALLOW 30 DAYS FOR SEARCH RESULTS**



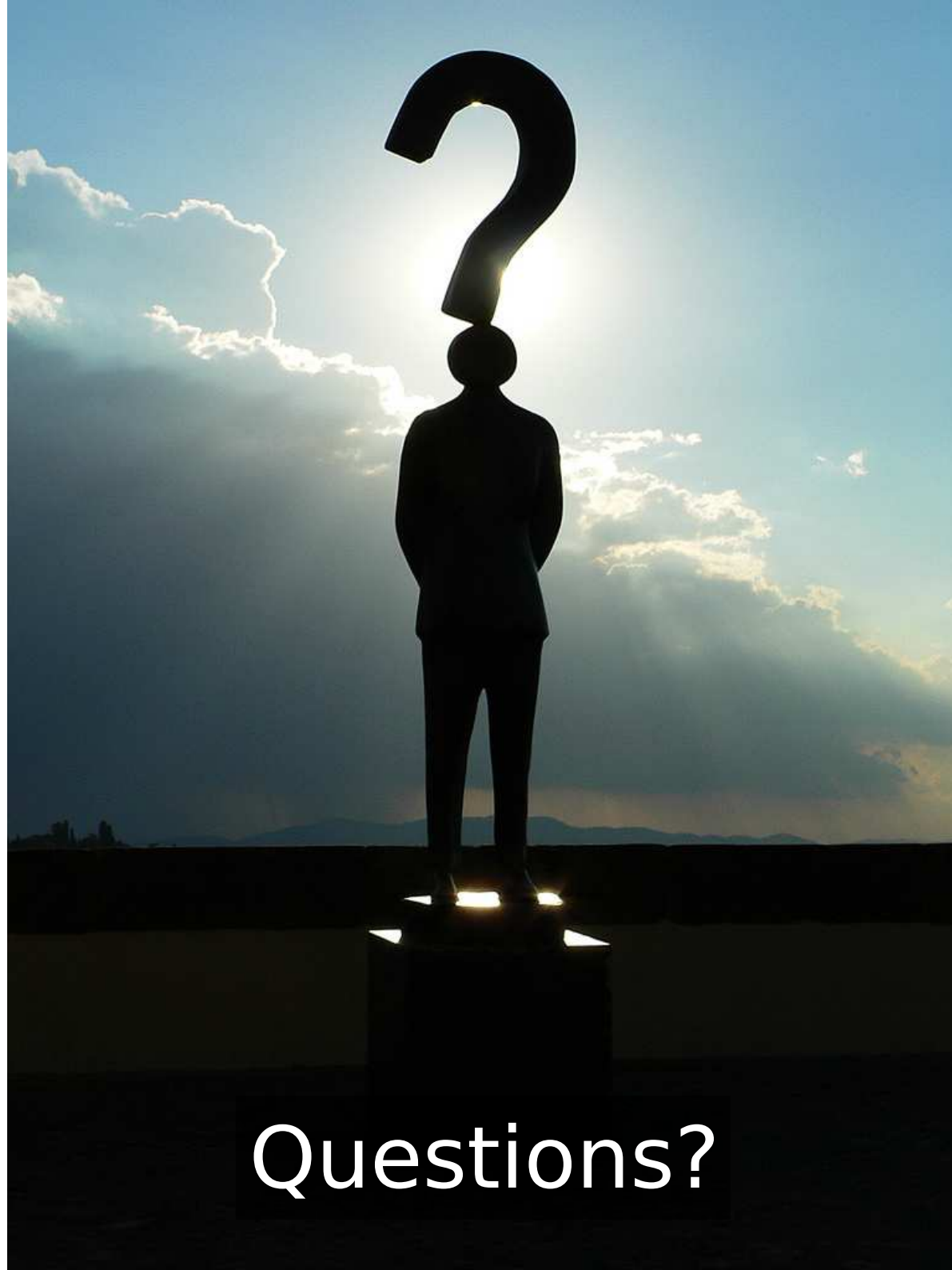


Source:

<http://gitorious.org/~cwiiis>

<http://git.clutter-project.org/mx/> ('kinetic-scrolling' branch)

<http://git.clutter-project.org/clutter-box2d/>



Questions?

