

Editing the Image Viewer: Getting Started With Creative Markup Language (CML)

Assumed knowledge-base

This tutorial assumes basic knowledge of hypertext mark-up language (HTML) or extensible mark-up language (XML). This includes a cursive understanding of tags, attributes and nested tag hierarchies. For an introduction to HTML and XML please see:

<http://www.w3schools.com/html/>

<http://www.w3schools.com/xml/>

What is CML?

CreativeML (CML) presents a fast and simple way to create and edit interactive rich media objects. CML is an XML-based language that allows developers to describe how media objects appear and behave in a multi-user multitouch environment.

Editing CML allows both non-programmers and programmers to make rapid changes to the application without coding ActionScript or having to re-compile the program.

How can I locate my CML document?

CML documents are created automatically and can be used whenever you create a new application in Open Exhibits 2 or GestureWorks 3. They are located in the root application folder inside the library folder in the folder named "cml".

To find the CML file associated with an application or component go to:

"application name">library>cml>

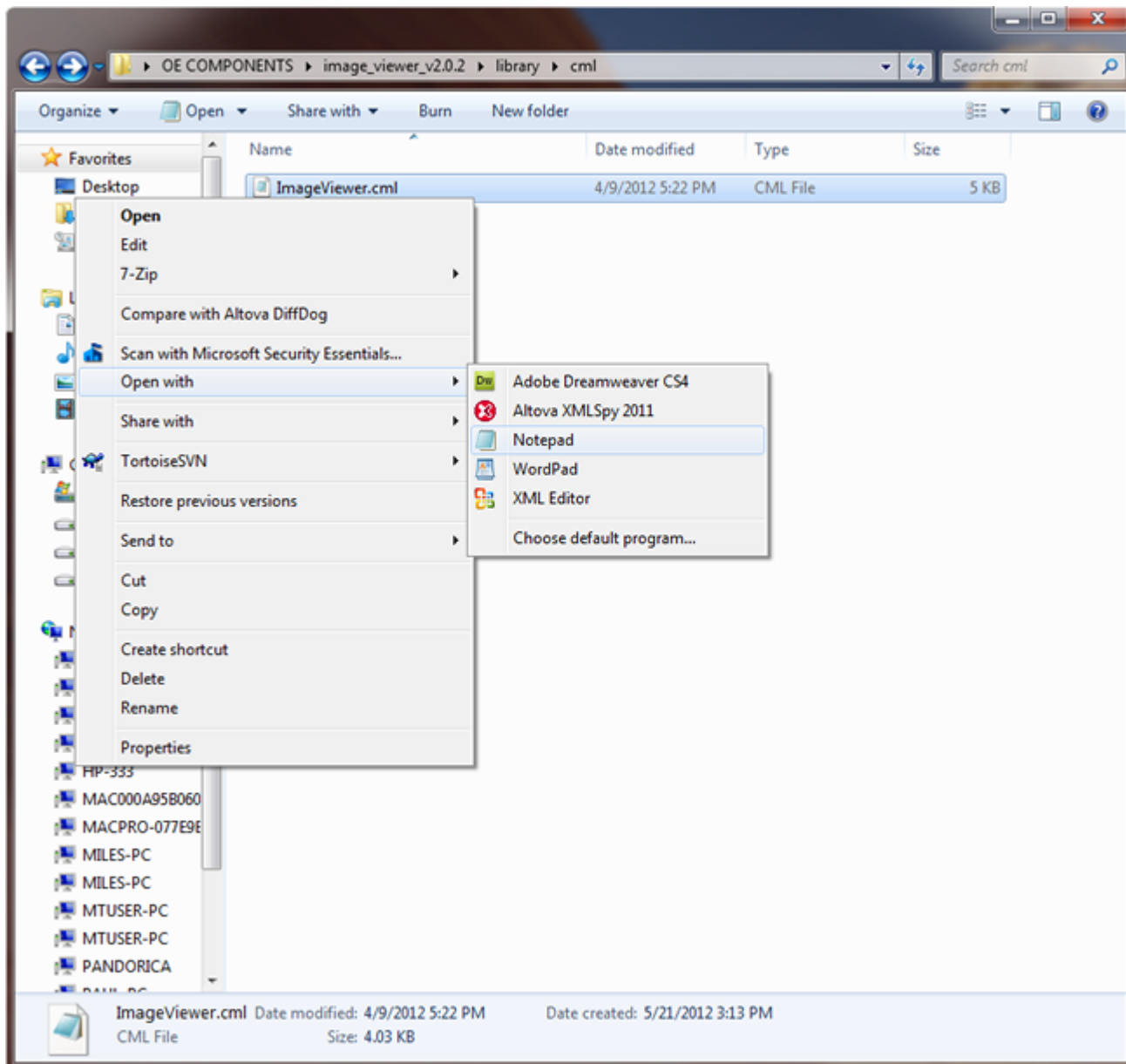
For example, for the ImageViewer component: in the folder named "cml" you will find a file named "ImageViewer.cml"

How do I open or edit the CML document?

CML files are fully-editable XML-based documents. The simplest method of editing a CML file is to open it directly in a text editor.

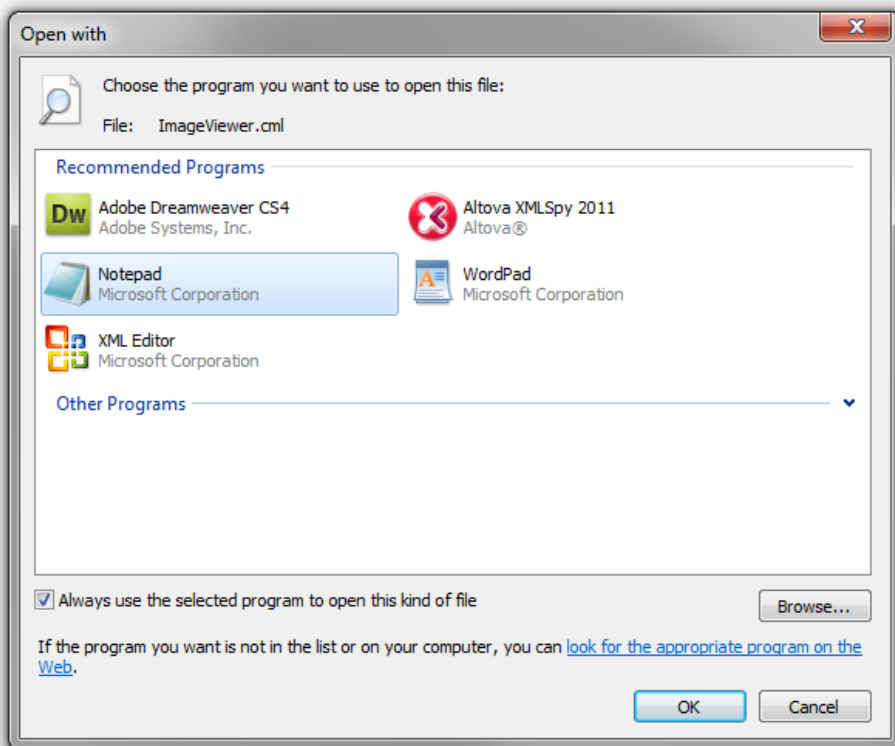
For Windows machines:

- Right click on the cml document: "ImageViewer.cml".
- Select "Open with" from the drop down menu.
- Then choose "Notepad".



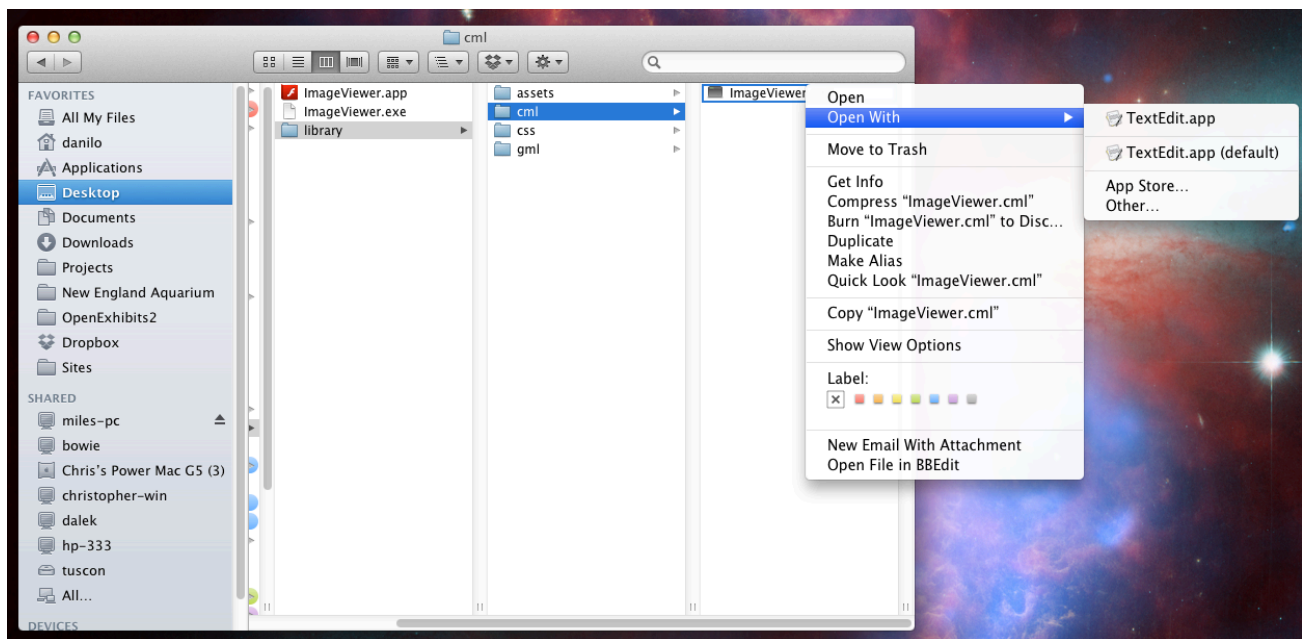
For Windows Machines: If NotePad is not presented as an automatic option:

- Select “Choose default program..” .
- In the “Open with” window click on the Microsoft Notepad icon.
- Then press the “OK” button.



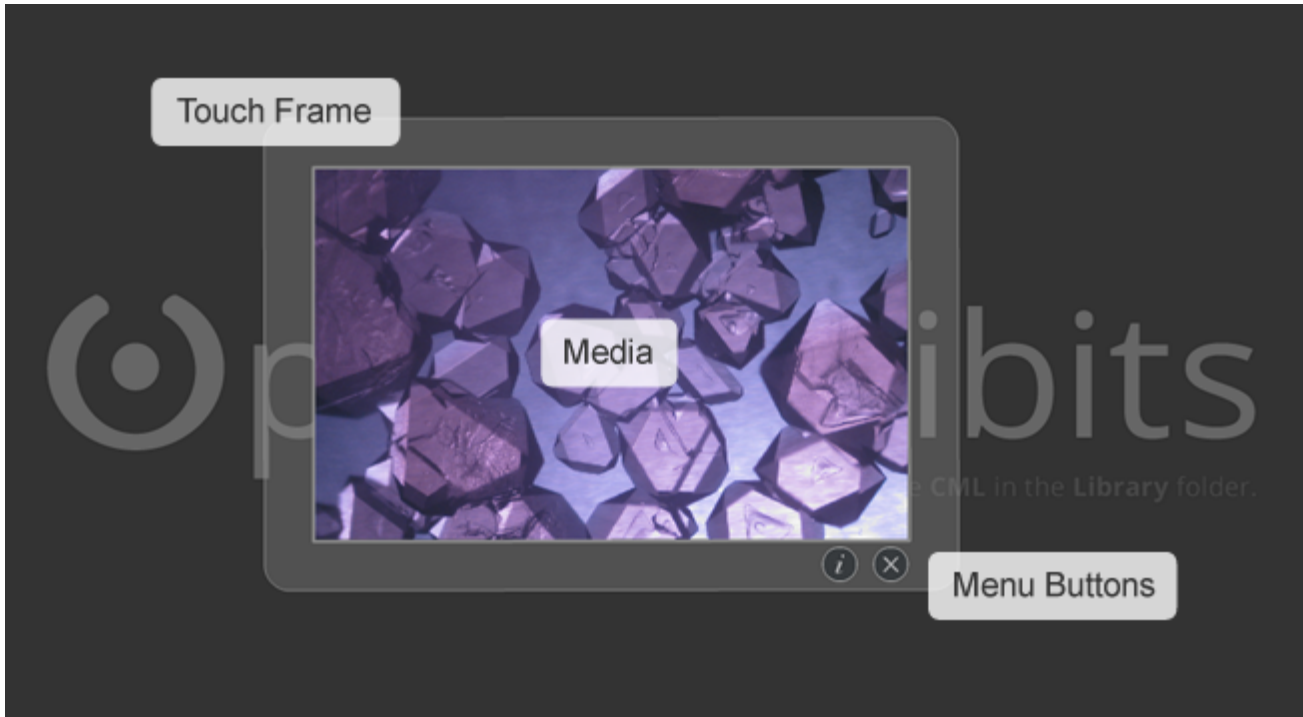
For Mac machines:

- Ctrl+ Click on the cml document: "ImageViewer.cml".
- Select "Open With" from the dropdown menu.
- Then choose "TextEdit".



A basic outline of a CML-driven application (ImageViewer Component)

A CML document is used to describe the way an interactive media object appears on stage and how the object behaves when touched. To do this effectively, the CML document uses a series of tags to create containers and associated display properties with each container. This structure creates a list of objects inside other objects; each with properties or “attributes” that can be used to characterize the object.



For example:

Inside the ImageViewer CML document, all objects are contained inside a single `<GestureWorksApplication>` tag. Inside this, there are objects that load universal assets such as `<LibraryKit>`, and an object that loads the background image, list of ImageViewer objects and an object that loads the “debug kit.” When editing objects to be displayed in the ImageViewer application, we only have to consider the `<ImageViewer>` objects, so we will focus only on the `<ImageViewer>` tags.

```
ImageViewer.cml - Notepad
File Edit Format View Help
<?xml version="1.0" encoding="UTF-8"?>
<GestureWorksApplication version="1.0.0" xmlns:cml="http://gestureworks.com/cml/version/1.0" gml="library/gml/my_gestures.gml" css="library/css/my_styles_modules.css" key="ENTER OE KEY" simulator="false">
  <LibraryKit>
    <Library type="swf" src="library/assets/openexhibits_assets.swf" />
  </LibraryKit>
  <ImageElement id="background_image" src="library/assets/oe_bg_720.png"/>
  <ImageViewer id="image-viewer-1" x="200" y="180" rotation="10" mouseChildren="true" disableNativeTransform="false" disableAffineTransform="false">
    <TouchContainer id="frame-c" class="frame_container" visible="true" targetParent="true" mouseChildren="false">
      <FrameElement id="frame-e" class="frame_element"/>
    </TouchContainer>
    <TouchContainer id="tc_img1" class="image_container" visible="true" targetParent="true" mouseChildren="false">
      <ImageElement id="img1" class="image_element" src="library/assets/crystal_oe2_1.jpg" resample="true" width="700"/>
    </TouchContainer>
    <TouchContainer id="img1-info" class="info_container" visible="false" targetParent="true" mouseChildren="false">
      <GraphicElement id="info-bg" class="info_bg" shape="rectangle"/>
      <TextElement id="title" border="false" class="info_title" selectable="false" text="Chrome Alum Crystals"/>
      <TextElement id="description" border="false" class="info_description" selectable="false" text="This is a photo of chrome alum crystals in a chrome alum solution, at 20x magnification. Take" />
    </TouchContainer>
    <Menu id="menu-1" class="menu_container" x="0" y="0" alpha="0.6" position="bottomRight" paddingLeft="0" paddingBottom="50" paddingRight="20" autoHide="true" visible="false">
      <ButtonElement id="info-btn" class="info_btn" dispatch="mouseDown.info" hit="info-hit" init="info-up" mouseDown="info-down" mouseUp="info-up" mouseOut="info-up">
        <Container id="info-up">
          <GraphicElement id="info-bg-up" class="btn-bg-up" />
          <SWFElement id="info-fg-up" class="btn-fg-up" classRef="org.openexhibits.assets.info" />
        </Container>
        <Container id="info-down">
          <GraphicElement id="info-bg-down" class="btn-bg-down" />
          <SWFElement id="info-fg-down" class="btn-fg-down" classRef="org.openexhibits.assets.info" />
        </Container>
        <Container id="info-hit">
          <GraphicElement id="info-hit-bg" shape="circle" radius="20" color="0x666666" alpha="0" />
        </Container>
      </ButtonElement>
      <ButtonElement id="close-btn" class="close_btn" dispatch="mouseDown.close" hit="close-hit" init="close-up" mouseDown="close-down" mouseUp="close-up" mouseOut="close-up">
        <Container id="close-up" class="up">
          <GraphicElement id="close-bg-up" class="btn-bg-up" />
          <SWFElement id="close-fg-up" class="btn-fg-up" classRef="org.openexhibits.assets.close" />
        </Container>
        <Container id="close-down" class="down">
          <GraphicElement id="close-bg-down" class="btn-bg-down" />
          <SWFElement id="close-fg-down" class="btn-fg-down" classRef="org.openexhibits.assets.close" />
        </Container>
        <Container id="close-hit" class="hit">
          <GraphicElement id="close-hit-bg" class="btn-hit" />
        </Container>
      </ButtonElement>
    </Menu>
    <GestureList>
      <Gesture ref="n-drag" gestureOn="true" />
      <Gesture ref="n-scale" gestureOn="true" />
      <Gesture ref="n-rotate" gestureOn="true" />
    </GestureList>
  </ImageViewer>
  <DebugKit displayOn="true" displayAlwaysOn="false" displayRadius="300">
    <DebugLayer type="point_shapes" displayOn="true" />
    <DebugLayer type="cluster_circle" displayOn="true" />
    <DebugLayer type="cluster_box" displayOn="true" />
    <DebugLayer type="cluster_center" displayOn="true" />
    <DebugLayer type="cluster_web" displayOn="true" />
    <DebugLayer type="cluster_rotation" displayOn="true" />
  </DebugKit>
</GestureWorksApplication>
```

How to edit media content in the ImageViewer:

To change the media content associated with with a ImageViewer object; identify the ImageViewer object by locating the <ImageViewer> tag. Inside this object locate the <ImageElement> tag (within the <TouchContainer> tag). Inside the <ImageElement> tag there is attribute called "src" which stands for "source".

To change the media file associated with this item, simply change the source file path. By default, media used in the demo examples are located in the "**application name**>**library**>**assets** folder. To access any media in this folder, make sure that the file path is matched accordingly. For example "library/assets/demos/crystal_oe2_1.jpg" will retrieve and load the file "crystal_oe2_1.jpg" into the image viewer object when .swf or .exe is clicked and launched from the root folder.


```
ImageViewer.cml - Notepad
File Edit Format View Help
<?xml version="1.0" encoding="UTF-8"?>
<GestureWorksApplication version="1.0.0" xmlns:cml="http://gestureworks.com/cml/version/1.0" gml="library/gml/my_gestures.gml" css="library/css/my_styles_modules.css" key="ENTER OE KEY" simulator="false">
  <LibraryKit>
    <Library type="swf" src="library/assets/openexhibits_assets.swf" />
  </LibraryKit>
  <ImageElement id="background_image" src="library/assets/oe_bg_720.png" />
  <ImageViewer id="image-viewer-1" x="200" y="180" rotation="10" mouseChildren="true" disableNativeTransform="false" disableAffineTransform="false">
    <TouchContainer id="frame-c" class="frame_container" visible="true" targetParent="true" mouseChildren="false">
      <FrameElement id="frame-e" class="frame_element" />
    </TouchContainer>
    <TouchContainer id="tc_img1" class="image_container" visible="true" targetParent="true" mouseChildren="false">
      <ImageElement id="img1" class="image_element" src="library/assets/crystal_oe2_1.jpg" resample="true" width="700" />
    </TouchContainer>
    <TouchContainer id="img1-info" class="info_container" visible="false" targetParent="true" mouseChildren="false">
      <GraphicElement id="info-bg" class="info_bg" shape="rectangle" />
      <TextElement id="title" border="false" class="info_title" selectable="false" text="Chrome Alum Crystals" />
      <TextElement id="description" border="false" class="info_description" selectable="false" text="This is a photo of chrome alum crystals in a chrome alum solution, at 20x magnification. Take" />
    </TouchContainer>
    <Menu id="menu-1" class="menu_container" x="0" y="0" alpha="0.6" position="bottomRight" paddingLeft="0" paddingBottom="-50" paddingRight="20" autoHide="true" visible="false">
      <ButtonElement id="info-btn" class="info_btn" dispatch="mouseDown:info" hit="info-hit" init="info-up" mouseDown="info-down" mouseUp="info-up" mouseOut="info-up">
        <Container id="info-up">
          <GraphicElement id="info-bg-up" class="btn-bg-up" />
          <SWFElement id="info-fg-up" class="btn-fg-up" classRef="org.openexhibits.assets.info" />
        </Container>
        <Container id="info-down">
          <GraphicElement id="info-bg-down" class="btn-bg-down" />
          <SWFElement id="info-fg-down" class="btn-fg-down" classRef="org.openexhibits.assets.info" />
        </Container>
        <Container id="info-hit">
          <GraphicElement id="info-hit-bg" shape="circle" radius="20" color="0x666666" alpha="0" />
        </Container>
      </ButtonElement>
      <ButtonElement id="close-btn" class="close_btn" dispatch="mouseDown:close" hit="close-hit" init="close-up" mouseDown="close-down" mouseUp="close-up" mouseOut="close-up">
        <Container id="close-up" class="up">
          <GraphicElement id="close-bg-up" class="btn-bg-up" />
          <SWFElement id="close-fg-up" class="btn-fg-up" classRef="org.openexhibits.assets.close" />
        </Container>
        <Container id="close-down" class="down">
          <GraphicElement id="close-bg-down" class="btn-bg-down" />
          <SWFElement id="close-fg-down" class="btn-fg-down" classRef="org.openexhibits.assets.close" />
        </Container>
        <Container id="close-hit" class="hit">
          <GraphicElement id="close-hit-bg" class="btn-hit" />
        </Container>
      </ButtonElement>
    </Menu>
    <GestureList>
      <Gesture ref="n-drag" gestureOn="true" />
      <Gesture ref="n-scale" gestureOn="true" />
      <Gesture ref="n-rotate" gestureOn="true" />
    </GestureList>
  </ImageViewer>
  <DebugKit displayOn="true" displayAlwaysOn="false" displayRadius="300">
    <DebugLayer type="point_shapes" displayOn="true" />
    <DebugLayer type="cluster_circle" displayOn="true" />
    <DebugLayer type="cluster_box" displayOn="true" />
    <DebugLayer type="cluster_center" displayOn="true" />
    <DebugLayer type="cluster_web" displayOn="true" />
    <DebugLayer type="cluster_rotation" displayOn="true" />
  </DebugKit>
</GestureWorksApplication>
```

2. How to change the meta-data associated with the ImageViewer:

Within <ImageViewer> tags, locate the <TouchContainer> tag with the attribute "id=img1-info". This container controls the meta-data panel displayed when the info button is pressed. To change the title displayed in this window locate the <TextElement> tag inside the <TouchContainer> tag and set the "text" attribute to "my new title text should be written here".

Title

Chrome Alum Crystals

Description

This is a photo of chrome alum crystals in a chrome alum solution, at 20x magnification. Taken with my Canon SX110 IS 10x stereo microscope with lighting from underneath. The crystals are grown from a saturated solution and are no more than 1 mm in diameter. Created myself, Paul, from www.paulslab.com.

Meta-data

ibits

the CML in the Library folder.


```
ImageViewer.cml - Notepad
File Edit Format View Help
<?xml version="1.0" encoding="UTF-8"?>
<GestureWorksApplication version="1.0.0" xmlns:cml="http://gestureworks.com/cml/version/1.0/" gml="library/gml/my_gestures.gml" css="library/css/my_styles_modules.css" key="ENTER OE KEY" simulator="false">
  <LibraryKit>
    <Library type="swf" src="library/assets/openexhibits_assets.swf" />
  </LibraryKit>
  <ImageElement id="background_image" src="library/assets/oe_bg_720.png"/>
  <ImageViewer id="image-viewer-1" x="200" y="180" rotation="10" mouseChildren="true" disableNativeTransform="false" disableAffineTransform="false">
    <TouchContainer id="frame-c" class="frame_container" visible="true" targetParent="true" mouseChildren="false">
      <FrameElement id="frame-e" class="frame_element" />
    </TouchContainer>
    <TouchContainer id="tc_img1" class="image_container" visible="true" targetParent="true" mouseChildren="false">
      <ImageElement id="img1" class="image_element" src="library/assets/crystal_oe2_1.jpg" rotation="10" scale="true" width="700" />
    </TouchContainer>
    <TouchContainer id="img1-info" class="info_container" visible="false" targetParent="true" mouseChildren="false">
      <GraphicElement id="info-bg" class="info_bg" shape="rectangle" />
      <TextElement id="title" border="false" class="info_title" selectable="false" text="Chrome Alum Crystals" />
      <TextElement id="description" border="false" class="info_description" selectable="false" text="This is a photo of chrome alum crystals in a chrome alum solution, at 20x magnification. Take" />
    </TouchContainer>
    <Menu id="menu-1" class="menu_container" x="0" y="0" alpha="0.6" position="bottomRight" paddingLeft="0" paddingBottom="-50" paddingRight="20" autoHide="true" visible="false">
      <ButtonElement id="info-btn" class="info_btn" dispatch="mouseDown:info" hit="info-hit" init="info-up" mouseDown="info-down" mouseUp="info-up" mouseOut="info-up">
        <Container id="info-up">
          <GraphicElement id="info-bg-up" class="btn-bg-up" />
          <SWFElement id="info-fg-up" class="btn-fg-up" classRef="org.openexhibits.assets.info" />
        </Container>
        <Container id="info-down">
          <GraphicElement id="info-bg-down" class="btn-bg-down" />
          <SWFElement id="info-fg-down" class="btn-fg-down" classRef="org.openexhibits.assets.info" />
        </Container>
        <Container id="info-hit">
          <GraphicElement id="info-hit-bg" shape="circle" radius="20" color="0x666666" alpha="0" />
        </Container>
      </ButtonElement>
      <ButtonElement id="close-btn" class="close_btn" dispatch="mouseDown:close" hit="close-hit" init="close-up" mouseDown="close-down" mouseUp="close-up" mouseOut="close-up">
        <Container id="close-up" class="up">
          <GraphicElement id="close-bg-up" class="btn-bg-up" />
          <SWFElement id="close-fg-up" class="btn-fg-up" classRef="org.openexhibits.assets.close" />
        </Container>
        <Container id="close-down" class="down">
          <GraphicElement id="close-bg-down" class="btn-bg-down" />
          <SWFElement id="close-fg-down" class="btn-fg-down" classRef="org.openexhibits.assets.close" />
        </Container>
        <Container id="close-hit" class="hit">
          <GraphicElement id="close-hit-bg" class="btn-hit" />
        </Container>
      </ButtonElement>
    </Menu>
    <GestureList>
      <Gesture ref="n-drag" gestureOn="true" />
      <Gesture ref="n-scale" gestureOn="true" />
      <Gesture ref="n-rotate" gestureOn="true" />
    </GestureList>
  </ImageViewer>
  <DebugKit displayOn="true" displayAlwaysOn="false" displayRadius="300">
    <DebugLayer type="point_shapes" displayOn="true" />
    <DebugLayer type="cluster_circle" displayOn="true" />
    <DebugLayer type="cluster_box" displayOn="true" />
    <DebugLayer type="cluster_center" displayOn="true" />
    <DebugLayer type="cluster_web" displayOn="true" />
    <DebugLayer type="cluster_rotation" displayOn="true" />
  </DebugKit>
</GestureWorksApplication>
```

3. How to change the position of the interactive buttons:

In the <ImageViewer> tags locate the <Menu> tag. This container controls the menu buttons and menu layout. To re-position the buttons to display on the top right of the ImageViewer: in the <Menu> tag, set the "position" attribute to "topRight".

```
ImageViewer.cml - Notepad
File Edit Format View Help
<?xml version="1.0" encoding="UTF-8"?>
<GestureWorksApplication version="1.0.0" xmlns:cml="http://gestureworks.com/cml/version/1.0" gml="library/gml/my_gestures.gml" css="library/css/my_styles_modules.css" key="ENTER OE KEY" simulator="false">
  <LibraryKit>
    <Library type="swf" src="library/assets/openexhibits_assets.swf" />
  </LibraryKit>
  <ImageElement id="background_image" src="library/assets/oe_bg_720.png"/>
  <ImageViewer id="image-viewer-1" x="200" y="180" rotation="10" mouseChildren="true" disableNativeTransform="false" disableAffineTransform="false">
    <TouchContainer id="frame-c" class="frame_container" visible="true" targetParent="true" mouseChildren="false">
      <FrameElement id="frame-e" class="frame_element"/>
    </TouchContainer>
    <TouchContainer id="tc_img1" class="image_container" visible="true" targetParent="true" mouseChildren="false">
      <ImageElement id="img1" class="image_element" src="library/assets/crystal_oe2_1.jpg" resample="true" width="700"/>
    </TouchContainer>
    <TouchContainer id="img1-info" class="info_container" visible="false" targetParent="true" mouseChildren="false">
      <GraphicElement id="info-bg" class="info_bg" shape="rectangle"/>
      <TextElement id="title" border="false" class="info_title" selectable="false" text="Chrome Alum Crystals"/>
      <TextElement id="description" border="false" class="info_description" selectable="false" text="This is a photo of chrome alum crystals in a chrome alum solution, at 20x magnification. Take a photo of the crystals." />
    </TouchContainer>
    <Menu id="menu-1" class="menu_container" x="0" y="0" alpha="0.6" position="bottomRight" paddingLeft="0" paddingBottom="50" paddingRight="20" autoHide="true" visible="false">
      <ButtonElement id="info-btn" class="info_btn" dispatch="mouseDown.info" hit="info-hit" init="info-up" mouseDown="info-down" mouseUp="info-up" mouseOut="info-up">
        <Container id="info-up">
          <GraphicElement id="info-bg-up" class="btn-bg-up" />
          <SWFElement id="info-fg-up" class="btn-fg-up" classRef="org.openexhibits.assets.info" />
        </Container>
        <Container id="info-down">
          <GraphicElement id="info-bg-down" class="btn-bg-down" />
          <SWFElement id="info-fg-down" class="btn-fg-down" classRef="org.openexhibits.assets.info" />
        </Container>
        <Container id="info-hit">
          <GraphicElement id="info-hit-bg" shape="circle" radius="20" color="0x666666" alpha="0" />
        </Container>
      </ButtonElement>
      <ButtonElement id="close-btn" class="close_btn" dispatch="mouseDown.close" hit="close-hit" init="close-up" mouseDown="close-down" mouseUp="close-up" mouseOut="close-up">
        <Container id="close-up" class="up">
          <GraphicElement id="close-bg-up" class="btn-bg-up" />
          <SWFElement id="close-fg-up" class="btn-fg-up" classRef="org.openexhibits.assets.close" />
        </Container>
        <Container id="close-down" class="down">
          <GraphicElement id="close-bg-down" class="btn-bg-down" />
          <SWFElement id="close-fg-down" class="btn-fg-down" classRef="org.openexhibits.assets.close" />
        </Container>
        <Container id="close-hit" class="hit">
          <GraphicElement id="close-hit-bg" class="btn-hit" />
        </Container>
      </ButtonElement>
    </Menu>
    <GestureList>
      <Gesture ref="n-drag" gestureOn="true" />
      <Gesture ref="n-scale" gestureOn="true" />
      <Gesture ref="n-rotate" gestureOn="true" />
    </GestureList>
  </ImageViewer>
  <DebugKit displayOn="true" displayAlwaysOn="false" displayRadius="300">
    <DebugLayer type="point_shapes" displayOn="true"/>
    <DebugLayer type="cluster_circle" displayOn="true"/>
    <DebugLayer type="cluster_box" displayOn="true"/>
    <DebugLayer type="cluster_center" displayOn="true"/>
    <DebugLayer type="cluster_web" displayOn="true"/>
    <DebugLayer type="cluster_rotation" displayOn="true"/>
  </DebugKit>
</GestureWorksApplication>
```

Where can I find more information about CML and GML?

We have developed an online wiki that provides a more detailed explanation and a complete set of CML examples for each component available in Open Exhibits 2 and GestureWorks 3. These online assets can be located here:

More about CML

- http://www.creativeml.org/wiki/index.php/Main_Page
- http://www.creativeml.org/wiki/index.php/Document_Definition
- http://www.creativeml.org/wiki/index.php/CML_Reference

More about GML

- http://www.gestureml.org/wiki/index.php/Main_Page

More about OE 2

- <http://openexhibits.org/support/tutorials/>
- <http://openexhibits.org/downloads/components/>