PowerRail
Technical Documentation

Abstract

PowerRail is a Papervision 3d and XML powered presenting tool. The application delivers a flash 3d environment in which content ranging from text, images, video's and even live streams can be displayed. Because of the versatility of the application the results are only limited to the user's creativity.

Figure 1: PowerRail Presenting Tool

1   Introduction

This document explains how to use the PowerRail application. PowerRail is a flash application which consists of several components. First we have the `PowerRail.swf` file which is the compiled flash project containing all the code to render the presentations. In the same directory as the swf file we have an `assets` folder. In this folder all the assets (images, models and videos) that are to be displayed in the presentation are stored, as well as the `powerrail.xml` presentation file, which contains the settings and actual positioning the assets in the presentation world.

To make explaining PowerRail easier, we state some definitions first. A PowerRail presentation consists of a list (called the *views list*) of several *views*. Every *view* contains zero or more *objects*. An *object* can for example be an image, 3d model, video or webcam stream. The set of objects that is associated with a particular view is called the *object list* of the view.

1.1   Active view and controls

At any time during the presentation, one of the views will be the *active view*, which means that the camera is positioned according to that view's properties. By advancing through the presentation, other views in the viewslist will become the active view. Both the up/down arrows and the W and S keys can be used to navigate respectively forward and backward in the views list, that may also be nicknamed *the rail*. If mouseview interaction is enabled in the settings the mouse can be used to look around within the active view.

1.2   XML: Settings

The structure of the powerrail.xml presentation file consists of 2 parts. The first part contains the settings for the project. The second part is the *views list*. The template of the settings section is as follows:

```
<settings>
  <firstView></firstView>
  <useWebcam>true|false</useWebcam>
  <guidedTour>true|false</guidedTour>
  <openLinksInNewWindow>_blank|_self|framename</openLinksInNewWindow>
  <mouseViewInteraction>true|false</mouseViewInteraction>
</settings>
```

As you can see, the settings part is opened by the <settings> tag, and closed by the </settings> tag.

- The first setting, <firstView>, sets which view should be the first view to show. If no information is entered, the first view in the views list will be selected automatically. Using this function you could for example start in the middle of a rail and navigate both forward and backward.

- The <useWebcam> has to be set to true if you want to use a live webcam feed in your presentation.

- If the <guidedTour> tag is set to true, the PowerRail will be set to an automated tour, in which each view will be displayed for a (per view definable) number of seconds. After this the Power-Rail will automatically navigate to the next view in the views list.

- The <openLinksInNewWindow> tag specifies where an external link has to be opened. This can be either _blank for a new page, _self for opening in the current window or framename where "framename" is the name of the frame where you would like the link to open.

- <mouseViewInteraction> Can be set to true or false, depending on wether you want to enable the user to look around using the mouse or not.

1.3   XML: Views list

The second part of the XML contains the actual information about the views and objects that are present in the rail. This section is called the *views list*. The *views list* is opened with the <views> tag, and closed with the </views> tag.

```
<views>
  [... at least one view ...]
</views>
```

The views list should contain at least one view, but in most presentations you wil use more than one view. Every view has a name to reference it in the rest of the presentation (for example when creating an internal link or in the firstView property of the settings section). Every view also has a position in 3d space that is set using the x, y and z properties. These properties determine where the camera will be placed when the view will be the active view. It is also possible to specify rotationX and rotationY properties, that determine the camera's rotation on the X and Y axis respectively. The tourTimeout property determines how many seconds pass before the presentation automatically moves on to the next view in case the guidedTour property is set to true in the settings section. The tweenTime property indicates the duration of the transition animation to the view when it becomes the active view.

2

```
<view name="viewname" x="0" y="0" z="0" tourTimeout="2" tweenTime="2">
  [... the object list of this view ...]
</view>
```

Every view contains zero or more objects. These objects can be text, images, 3d models, videos and/or webcam streams, and do not necessarily have to be visible from the camera's point of view as it is positioned when the view is the active view. All objects can in principle be visible from any view. This means that for example during a presentation the objects that belong to views further in the presentation may be visible from earlier views. For each object the following properties can be set:

- The `x`, `y` and `z` properties determine the position of the object relative to the view that it belongs to.

- The `type` property determines which type the object has. Possible types are: image, text, dae, swf (only very basic swf's without interaction are supported), movie, or webcam.

- The `source` property indicates the location of the source in case the objects is loaded from an external file, or the text that is to be displayed in case of a text object.

- The `scale` property can be used to scale an object keeping its aspect ratio correct.

- The `width` and `height` properties can be used to set the dimensions of an object to a specified width and height.

- The `rotationX`, `rotationY` and `rotationZ` properties can be used to specify the rotation of the object on the X, Y and Z axis respectively.

- The `transparency` property can be used to enable or disable transparency.

For text objects a few additional properties can be set:

- The `fontcolor` property sets the color of the font inside the textobjects, the given value must be in hex such as "0xFFFFFF"

- The `fontsize` property sets the size of the font inside the textobject.

1.4   Advanced object properties

In addition to the regular object properties we can also specify some advanced properties to enhance the display of objects and for example the interactivity.

- The `animate` property can be used to apply animations to objects. The animation calls are (for now) restricted to `RotateX(value)`, `RotateY(value)` or `RotateZ(value)` where "value" stands for an integer describing the ammount of degrees that the object should rotate each frame. An example could be the following property: `animation="RotateY(1.5)"` which makes the object rotate on the Y axis with 1.5 degrees each frame.

- The `click` property can be used in a similar way to make the object clickable. The property values are limited to `Internal(viewname)`, `External(url)` or `Filter(filtername)`. The internal link can be used to link to another view within the current views list. For example, if you would give a picture the property `Internal(cow)`, clicking this picture will make the view named "cow" the active view. The internal link gives the opportunity to make choices within the presentation, for instance: clicking the left image could link to another view than the right image. The external link can be used to link to an external url. For instance, when the property `External(http://www.few.vu.nl)` is assigned to a picture, clicking this picture would result in visiting the Few website using the browser (depending on how the setting `<openLinksInNewWindow>` is set). Finally, the filter link can be used to activate a filter by clicking on an object. The currently implemented filters are `Glow(value)`, `Convolution(value)` and `Blur(value)` where value is an integer describing intensity of the filter.

As a concrete example of a view with objects, consider the following XML:

```
<view name="start" x="0" y="1000" z="2000" tourTimeout="2">
  <objects>
    <object type="dae" source="cow.dae" scale="2"
            x="-300" y="-300" z="500" rotationY="-30"/>
    <object type="text" width="500" fontcolor="0xffffff"
            fontsize="30" height="300" source="This is a text"
            x="300" y="0" z="300" rotationY="15"/>
    <object type="image" source="picture.png" click="Internal(end)"
            width="226" height="183" x="-100" y="0" z="200" rotationY="-20"/>
</view>
```

The name of this view is "start", it is positioned at 1000 upwards on the y-axis and 2000 far in the z-axis. If the `<guidedTour>` tag in the settings is set to true, then this view will timeout in 2 seconds, as specified by the property `tourTimeout`. This view contains three objects. The first object is a cow model loaded from the cow.dae file. It is scaled 2 times so it is bigger then it originally was. The position of the cow is 300 to the left of the view, 300 downward on the y-axis and 500 units far in the z-axis. The y-rotation of this model is -30 which tilts the cow 30 degrees to the right. The second object is a text field which is 500 units wide and contains a white font (0xffffff) with a fontsize of 30 units. The third object is the image "picture.png" which resides in the assets folder. Whenever the picture is clicked it zooms to the view named "last".

1.5   XML Examples

Some example XML files can be found on ⟨www.power-rail.net⟩. One of these is the standard Power-Rail slides presentation example which showcases the great majority of the available functionality.

```
<?xml version="1.0" encoding="utf-8" ?>
<data>
  <settings>
    <firstView>start</firstView>
    <useWebcam>true</useWebcam>
    <guidedTour>false</guidedTour>
    <openLinksInNewWindow>_blank</openLinksInNewWindow>
    <mouseViewInteraction>true</mouseViewInteraction>
  </settings>
  <views>

    <view name="start" x="0" y="3000" z="-3000"
      next="powerrail" previous="" tourTimeout="2">
      <objects/>
    </view>

    <view name="powerrail" x="0" y="0" z="0" tourTimeout="2" tweenTime="2">
      <objects>
        <object type="text" width="800" fontcolor="0xffffff" fontsize="100"
                height="300" source="  PowerRail    ~VR0809"
                x="0" y="0" z="400" rotationY="0" transparency="false"/>
      </objects>
    </view>


    <view name="1" x="0" y="500" z="1000" tourTimeout="2">
```

```
    <objects>
      <object type="text" width="800" fontcolor="0xffffff" fontsize="100"
              height="300" source="Papervision3d / XML Powered Presenting Tool"
              x="0" y="0" z="400" rotationY="0" transparency="false"/>
    </objects>
</view>


<view name="2" x="0" y="1000" z="2000" tourTimeout="2">
    <objects>
      <object type="dae" source="cow.dae" scale="2"
              x="-300" y="-300" z="500" rotationY="-30"/>
      <object type="text" width="600" fontcolor="0xffffff" fontsize="150"
              height="200" source="Features" x="-300" y="300" z="800"
              rotationY="-20" transparency="false" underline="true"/>
      <object type="text" width="500" fontcolor="0xffffff" fontsize="30"
              height="300" source="-3D World ..."
              x="300" y="0" z="400" rotationY="15" transparency="false"/>
    </objects>
</view>


<view name="3" x="0" y="3000" z="6000" tourTimeout="2">
    <objects>
      <object type="dae" source="house.dae" click="blur(10)" scale="1"
              x="-200" y="-300" z="500" rotationY="-30" animation="RotateY(1.5)"/>
      <object type="text" width="600" fontcolor="0xffffff" fontsize="150"
              height="200" source="Objects" x="-300" y="300" z="800"
              rotationY="-20" transparency="false" underline="true"/>
      <object type="text" width="500" fontcolor="0xffffff" fontsize="30"
              height="300" source="-Collada 3d models ..."
              x="300" y="0" z="400" rotationY="15" transparency="false"/>
    </objects>
</view>


<view name="4" x="0" y="4000" z="8000" tourTimeout="2">
    <objects>
      <object type="image" source="pingwing.png" click="Filter(glow,10)"
              width="300" height="300" x="-200" y="-100" z="500" rotationY="-20"/>
      <object type="text" width="600" fontcolor="0xffffff" fontsize="150"
              height="200" source="Objects" x="-300" y="300" z="800"
              rotationY="-20" transparency="false" underline="true"/>
      <object type="text" width="500" fontcolor="0xffffff" fontsize="30"
              height="300" source="-Transparency ..."
              x="300" y="0" z="400" rotationY="15" transparency="false"/>
    </objects>
</view>


<view name="5" x="0" y="5000" z="10000" tourTimeout="2">
    <objects>
      <object type="webcam" x="-200" y="-100" z="500"
              rotationY="-20" click="Filter(blur,15)"/>


      <object type="text" width="600" fontcolor="0xffffff" fontsize="150"
```

```
                height="200" source="Webcam" x="-300" y="300" z="800"
                rotationY="-20" transparency="false" underline="true"/>
        <object type="text" width="500" fontcolor="0xffffff" fontsize="30"
                height="300" source="-Plug and play ..."
                x="300" y="0" z="400" rotationY="15" transparency="false"/>
      </objects>
    </view>

    <view name="6" x="0" y="6000" z="12000" tourTimeout="2">
      <objects>
        <object type="image" click="External(../powerportfolio)"
                source="powerportfolio.png"
                width="500" height="400" x="0" y="-100" z="500" rotationY="0"/>
        <object type="text" width="700" fontcolor="0xffffff" fontsize="150"
                height="200" source="Example 1" x="-300" y="300" z="800"
                rotationY="-20" transparency="false" underline="true"/>
      </objects>
    </view>

    <view name="7" x="0" y="7000" z="15000" tourTimeout="2">
      <objects>
        <object type="image" click="External(../powerwall)" source="powerwall.png"
                width="500" height="400" x="0" y="-100" z="500" rotationY="0"/>
        <object type="text" width="700" fontcolor="0xffffff" fontsize="150"
                height="200" source="Example 2" x="-300" y="300" z="800"
                rotationY="-20" transparency="false" underline="true"/>
      </objects>
    </view>

    <view name="7" x="0" y="8000" z="18000" tourTimeout="2">
      <objects>
        <object type="image" click="External(../powergallery)" source="powergallery.png"
                width="500" height="400" x="0" y="-100" z="500" rotationY="0"/>
        <object type="text" width="700" fontcolor="0xffffff" fontsize="150"
                height="200" source="Example 3" x="-300" y="300" z="800"
                rotationY="-20" transparency="false" underline="true"/>
      </objects>
    </view>

    <view name="end" x="0" y="9000" z="21000" tourTimeout="2" tweenTime="2">
      <objects>
        <object type="text" width="800" fontcolor="0xffffff" fontsize="100"
                height="300" source="  PowerRail    ~VR0809" x="0" y="0" z="400"
                rotationY="0" transparency="false"/>
      </objects>
    </view>

  </views>
</data>
```
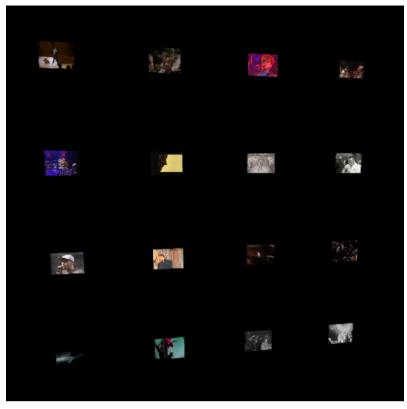
Figure 2: PowerWall, an example of the PowerRail engine

Another, totally different example is the PowerWall example (see image above), which uses the PowerRail engine to create a digital video wall just by placing the views in a totally different way:

```
<?xml version="1.0" encoding="utf-8" ?>
<data>
  <settings>
    <firstView>start</firstView>
    <useWebcam>true</useWebcam>
    <guidedTour>false</guidedTour>
    <openLinksInNewWindow>true</openLinksInNewWindow>
    <mouseViewInteraction>true</mouseViewInteraction>
  </settings>
  <views>

    <view name="start" x="-1000" y="1000" z="-2000" previous="" tourTimeout="2">
      <objects/>
    </view>

    <view name="1" x="0" y="0" z="1000" tourTimeout="2">
      <objects>
        <object type="movie"
                source="movies/glenngould_bach_gv_aria.flv"
                x="0" y="0" z="200"/>
      </objects>
    </view>

    <view name="2" x="0" y="1000" z="1000" tourTimeout="2">
      <objects>
        <object type="movie"
```

```
                        source="movies/jamesbrown_ifeelgood.flv"
                        x="0" y="0" z="200"/>
        </objects>
    </view>


    <view name="3" x="-1000" y="1000" z="1000" tourTimeout="2">
        <objects>
            <object type="movie" source="movies/johnnycash_hurt.flv"
                        x="0" y="0" z="200"/>
        </objects>
    </view>


    <view name="4" x="-1000" y="0" z="1000" tourTimeout="2">
        <objects>
            <object type="movie" source="movies/elvispresley_returntosender.flv"
                        x="0" y="0" z="200"/>
        </objects>
    </view>


    <view name="5" x="-1000" y="-1000" z="1000" tourTimeout="2">
        <objects>
            <object type="movie" source="movies/thebeatles_strawberryfieldsforever.flv"
                        x="0" y="0" z="200"/>
        </objects>
    </view>


    <view name="6" x="0" y="-1000" z="1000" tourTimeout="2">
        <objects>
            <object type="movie" source="movies/otisredding_tryalittletenderness.flv"
                        x="0" y="0" z="200"/>
        </objects>
    </view>


    <view name="7" x="1000" y="-1000" z="1000" tourTimeout="2">
        <objects>
            <object type="movie" source="movies/jimihendrix_voodoochile.flv"
                        x="0" y="0" z="200"/>
        </objects>
    </view>


    <view name="8" x="1000" y="0" z="1000" tourTimeout="2">
        <objects>
            <object type="movie" source="movies/frankzappa_peachesenregalia.flv"
                        x="0" y="0" z="200"/>
        </objects>
    </view>


    <view name="9" x="1000" y="1000" z="1000" tourTimeout="2">
        <objects>
            <object type="movie" source="movies/milesdavis_sowhat.flv"
                        x="0" y="0" z="200"/>
        </objects>
    </view>
```

```xml
      <view name="10" x="1000" y="2000" z="1000" tourTimeout="2">
        <objects>
          <object type="movie" source="movies/thewho_babaoreily.flv"
                  x="0" y="0" z="200"/>
        </objects>
      </view>


      <view name="11" x="0" y="2000" z="1000" tourTimeout="2">
        <objects>
          <object type="movie" source="movies/pinkfloyd_comfortablynumb.flv"
                  x="0" y="0" z="200"/>
        </objects>
      </view>


      <view name="12" x="-1000" y="2000" z="1000" tourTimeout="2">
        <objects>
          <object type="movie" source="movies/steviewonder_superstition.flv"
                  x="0" y="0" z="200"/>
        </objects>
      </view>


      <view name="13" x="-2000" y="2000" z="1000" tourTimeout="2">
        <objects>
          <object type="movie" source="movies/michaeljackson_billiejean.flv"
                  x="0" y="0" z="200"/>
        </objects>
      </view>


      <view name="14" x="-2000" y="1000" z="1000" tourTimeout="2">
        <objects>
          <object type="movie" source="movies/nirvana_comeasyouare.flv"
                  x="0" y="0" z="200"/>
        </objects>
      </view>


      <view name="15" x="-2000" y="0" z="1000" tourTimeout="2">
        <objects>
          <object type="movie" source="movies/eminemdido_stan.flv"
                  x="0" y="0" z="200"/>
        </objects>
      </view>


      <view name="16" next="start" x="-2000" y="-1000" z="1000" tourTimeout="2">
        <objects>
          <object type="movie" source="movies/venetiansnares_szamarmadar.flv"
                  x="0" y="0" z="200"/>
        </objects>
      </view>
    </views>
</data>
```