

# Basic 3D Flash Programming with Papervision3D

The following sample codes are only used to demonstrate the very basics of 3D Flash Programming with Papervision3D, which are:

1. [Setting up the Environment](#)
2. [Initializing Papervision3D](#)
3. [Loading and Displaying external 3D model](#)
4. [Interacting with 3D](#)

Before you continue reading, please bear in mind that aside from Papervision3D, the codes below use **MovieClip3D** class which is from another framework, called WIND, thus it is not included to Papervision3D's official distribution.

To know more about WIND, see <http://konsolscript.org/~mjmendoza/wind/>.

## Setting up the Environment

1. **Open FlashDevelop** if you haven't done it yet.
2. Create a new project by clicking **Project > New Project**. A dialog box will pop-up.
3. Select **AS3 Project** template, then type the name of your project. Toggle-on, **Create directory for project**.
4. Add the frameworks, Papervision3D and Wind, to classpath either from:
  - **Project > Properties > Classpaths > Add Classpath...** or
  - **Tools > Global Classpaths > Add Classpath...**

## Initializing Papervision3D

**Open Main.as** and change its content to the code written below. **Compile** and **Run** the program by pressing **Ctrl + Enter**. It will be just plain white as there's nothing to display. Even so, Papervision3D is now initialized.

```
package {
    import flash.display.Sprite;
    import flash.events.Event;

    import org.papervision3d.cameras.CameraType;
    import org.papervision3d.view.BasicView;
    import org.papervision3d.lights.PointLight3D;

    /**
     * ...
     * @author {Your Name}
     */
    public class Main extends Sprite {
        private var view:BasicView;

        public function Main():void {
            if (stage) init();
        }
    }
}
```

```

    else addEventListener(Event.ADDED_TO_STAGE, init);
}

private function init(e:Event = null):void {
    removeEventListener(Event.ADDED_TO_STAGE, init);
    // entry point

    view = new BasicView(600, 400, false, true, CameraType.FREE);
    addChild(view);

    addEventListener(Event.ENTER_FRAME, onRenderViewport);
}

private function onRenderViewport(e:Event):void {
    view.singleRender();
}
}
}

```

## Loading and Displaying external 3D model

Add the codes highlighted below and compile the program. Provided that “**test1.dae**” exists, you should be able to see the exported model in your 3D flash program.

```

package {
    import flash.display.Sprite;
    import flash.events.Event;

    import org.papervision3d.cameras.CameraType;
    import org.papervision3d.view.BasicView;
    import org.papervision3d.lights.PointLight3D;

    import org.papervision3d.objects.parsers.DAE;
    import org.wind.display.MovieClip3D;
    import org.wind.display.Sprite3D;

    /**
     * ...
     * @author {Your Name}
     */
    public class Main extends Sprite {
        private var view:BasicView;
        private var mc3D:MovieClip3D;

        public function Main():void {
            if (stage) init();
            else addEventListener(Event.ADDED_TO_STAGE, init);
        }

        private function init(e:Event = null):void {
            removeEventListener(Event.ADDED_TO_STAGE, init);
            // entry point

            view = new BasicView(600, 400, false, true, CameraType.FREE);
            addChild(view);

            mc3D = new MovieClip3D();
            view.scene.addChild(mc3D);

            var dae:DAE = new DAE();

```

```

    dae.load("test1.dae");
    mc3D.addFrame(new Sprite3D(dae));

    mc3D.scale = 50; //change to desired value
    mc3D.play(true,true);

    addEventListener(Event.ENTER_FRAME, onRenderViewport);
}

private function onRenderViewport(e:Event):void {
    mc3D.render();
    mc3D.rotationY++;
    view.singleRender();
}
}
}

```

## Displaying an Animated 3D model

### 2-framed Animation

To have an animating 3D object, you can use `MovieClip3D`'s **addFrame** to load two or more *pre-animated* exported models. The code below will show you how to do it.

```

package {
    import flash.display.Sprite;
    import flash.events.Event;

    import org.papervision3d.cameras.CameraType;
    import org.papervision3d.view.BasicView;
    import org.papervision3d.lights.PointLight3D;

    import org.papervision3d.objects.parsers.DAE;
    import org.wind.display.MovieClip3D;
    import org.wind.display.Sprite3D;

    /**
     * ...
     * @author {Your Name}
     */
    public class Main extends Sprite {
        private var view:BasicView;
        private var mc3D:MovieClip3D;

        public function Main():void {
            if (stage) init();
            else addEventListener(Event.ADDED_TO_STAGE, init);
        }

        private function init(e:Event = null):void {
            removeEventListener(Event.ADDED_TO_STAGE, init);
            // entry point

            view = new BasicView(600, 400, false, true, CameraType.FREE);
            addChild(view);

            mc3D = new MovieClip3D();
            view.scene.addChild(mc3D);
        }
    }
}

```

```

var dae:DAE = new DAE();
    dae.load("test1.dae");
    mc3D.addFrame(new Sprite3D(dae), 10); // change 10 to desired value
var dae2:DAE = new DAE();
    dae2.load("test2.dae");
    mc3D.addFrame(new Sprite3D(dae2), 10); // change 10 to desired value

    mc3D.scale = 50; //change to desired value
    mc3D.play(true,true);

    addEventListener(Event.ENTER_FRAME, onRenderViewport);
}

private function onRenderViewport(e:Event):void {
    mc3D.render();
    mc3D.rotationY++;
    view.singleRender();
}
}
}

```

## Sequenced Animation

Provided that you have exported a sequence of animated model with names, “test1.dae”, “test2.dae”, ..., “testN.dae”, you can use MovieClip3D's **addColladaSequence** to animated them in flash.

```

package {
    import flash.display.Sprite;
    import flash.events.Event;

    import org.papervision3d.cameras.CameraType;
    import org.papervision3d.view.BasicView;
    import org.papervision3d.lights.PointLight3D;

    import org.papervision3d.objects.parsers.DAE;
    import org.wind.display.MovieClip3D;
    import org.wind.display.Sprite3D;

    /**
     * ...
     * @author {Your Name}
     */
    public class Main extends Sprite {
        private var view:BasicView;
        private var mc3D:MovieClip3D;

        public function Main():void {
            if (stage) init();
            else addEventListener(Event.ADDED_TO_STAGE, init);
        }

        private function init(e:Event = null):void {
            removeEventListener(Event.ADDED_TO_STAGE, init);
            // entry point

            view = new BasicView(600, 400, false, true, CameraType.FREE);
            addChild(view);

            mc3D = new MovieClip3D();
            view.scene.addChild(mc3D);
        }
    }
}

```

```

        mc3D.addColladaSequence("test", null, "", 25, 1); // change 25 and 1 to desired
value

        mc3D.scale = 50; //change to desired value
        mc3D.play(true,true);

        addEventListener(Event.ENTER_FRAME, onRenderViewport);
    }

    private function onRenderViewport(e:Event):void {
        mc3D.render();
        mc3D.rotationY++;
        view.singleRender();
    }
}
}
}

```

## Interacting with 3D

### Adding Interaction

It's time to throw in some interaction. Let's add event listeners to keyboard inputs using **KeyboardEvent**.

```

package {
    import flash.display.Sprite;
    import flash.events.Event;
    import flash.events.KeyboardEvent;
    import flash.ui.Keyboard;

    import org.papervision3d.cameras.CameraType;
    import org.papervision3d.view.BasicView;
    import org.papervision3d.lights.PointLight3D;

    import org.papervision3d.objects.parsers.DAE;
    import org.wind.display.MovieClip3D;
    import org.wind.display.Sprite3D;

    /**
     * ...
     * @author {Your Name}
     */
    public class Main extends Sprite {
        private var view:BasicView;
        private var mc3D:MovieClip3D;

        public function Main():void {
            if (stage) init();
            else addEventListener(Event.ADDED_TO_STAGE, init);
        }

        private function init(e:Event = null):void {
            removeEventListener(Event.ADDED_TO_STAGE, init);
            // entry point

            view = new BasicView(600, 400, false, true, CameraType.FREE);
            addChild(view);

            mc3D = new MovieClip3D();

```

```

        view.scene.addChild(mc3D);

        mc3D.addColladaSequence("test", null, "", 25, 1); // change 25 and 1 to desired
value

        mc3D.scale = 50; //change to desired value
        mc3D.play(true,true);

        addEventListener(Event.ENTER_FRAME, onRenderViewport);
        stage.addEventListener(KeyboardEvent.KEY_DOWN, stage_onKeyDown);
        stage.addEventListener(KeyboardEvent.KEY_UP, stage_onKeyUp);
    }

    private var rotateLeft:Boolean;

    private function stage_onKeyDown(e:KeyboardEvent):void {
        if (e.keyCode == Keyboard.LEFT) {
            rotateLeft = true;
        }
    }

    private function stage_onKeyUp(e:KeyboardEvent):void {
        if (e.keyCode == Keyboard.LEFT) {
            rotateLeft = false;
        }
    }

    private function onRenderViewport(e:Event):void {
        mc3D.render();
        if (rotateLeft) {
            mc3D.rotationY++;
        }

        mc3D.rotationY++;
        view.singleRender();
    }
}
}

```

## Moving the 3D around

Adding more key listeners, let us move that 3D model around using `DisplayObject3D`'s **moveForward** and **moveBackward** functions.

```

package {
    import flash.display.Sprite;
    import flash.events.Event;
    import flash.events.KeyboardEvent;
    import flash.ui.Keyboard;

    import org.papervision3d.cameras.CameraType;
    import org.papervision3d.view.BasicView;
    import org.papervision3d.lights.PointLight3D;

    import org.papervision3d.objects.parsers.DAE;
    import org.wind.display.MovieClip3D;
    import org.wind.display.Sprite3D;

    /**
     * ...

```

```

* @author {Your Name}
*/
public class Main extends Sprite {
    private var view:BasicView;
    private var mc3D:MovieClip3D;

    public function Main():void {
        if (stage) init();
        else addEventListener(Event.ADDED_TO_STAGE, init);
    }

    private function init(e:Event = null):void {
        removeEventListener(Event.ADDED_TO_STAGE, init);
        // entry point

        view = new BasicView(600, 400, false, true, CameraType.FREE);
        addChild(view);

        mc3D = new MovieClip3D();
        view.scene.addChild(mc3D);

        mc3D.addColladaSequence("test", null, "", 25, 1); // change 25 and 1 to desired
value

        mc3D.scale = 50; //change to desired value
        mc3D.play(true,true);

        addEventListener(Event.ENTER_FRAME, onRenderViewport);
        stage.addEventListener(KeyboardEvent.KEY_DOWN, stage_onKeyDown);
        stage.addEventListener(KeyboardEvent.KEY_UP, stage_onKeyUp);
    }

    private var rotateLeft:Boolean;
private var rotateRight:Boolean;
private var moveForward:Boolean;
private var moveBackward:Boolean;

    private function stage_onKeyDown(e:KeyboardEvent):void {
        if (e.keyCode == Keyboard.LEFT) {
            rotateLeft = true;
        } else if (e.keyCode == Keyboard.RIGHT) {
            rotateRight = true;
        } else if (e.keyCode == Keyboard.UP) {
            moveForward = true;
        } else if (e.keyCode == Keyboard.DOWN) {
            moveBackward = true;
        }
    }

    private function stage_onKeyUp(e:KeyboardEvent):void {
        if (e.keyCode == Keyboard.LEFT) {
            rotateLeft = false;
        } else if (e.keyCode == Keyboard.RIGHT) {
            rotateRight = false;
        } else if (e.keyCode == Keyboard.UP) {
            moveForward = false;
        } else if (e.keyCode == Keyboard.DOWN) {
            moveBackward = false;
        }
    }
}

```

```
private function onRenderViewport (e:Event):void {
    mc3D.render();
    if (rotateLeft) {
        mc3D.rotationY++;
    } else if (rotateRight) {
        mc3D.rotationY--;
    }

    if (moveForward) {
        mc3D.moveForward(3);
    } else if (moveBackward) {
        mc3D.moveBackward(3);
    }
    mc3D.rotationY++;
    view.singleRender();
}
}
```

## ***Where to go from here?***

With these basics, you can now make flash-based websites in 3D. Make 3D games. The possibilities are endless. You are only limited by your imagination and creativity.

You can delve deeper to Augmented Reality.

Learn more of Papervision3D. Join the community at <http://forum.papervision.org>.

## ***Resources***

You can get a PDF copy of this article and source code from the site indicated below.

<http://konsolscript.org/~mjmandoza/papervision/>

## ***Related Article***

Interested in Game Programming? Check out:

<http://konsolscript.org/~mjmandoza/freebasic/basic-game-programming-with-freebasic/>