



Since June 2009, I have been working with US Asia Internet, Inc. as an intern. During this experience, I was exposed to and learned to build ActionScript 3 scripts and xml structures within the Adobe Flex environment. I specifically learned quite a bit about the software technologies involving Flex/Flash/ActionScript, as well as an appreciation for the differences and similarities among languages such as Java (taught at SJSU), ActionScript, and Objective-C.

My specific project was to translate a game created in ActionScript 2 for Flash Player 7 to a more procedural and object-based form using ActionScript 3 and Flex for Flash Player 9. ActionScript specifies all the interactivity for the game: Actionscript 2.0 was the earlier version, and is a programming language whose basic syntax is derived from ECMAScript with class-based inheritance. The more advanced Actionscript 3.0 has more evolved data types, allowing both Internet-based projects as well as desktop applications.

Since my passion lies in games programming, I collaborated with US Asia Internet game programmers and graphic designers on creating a game for learning Chinese characters. The goal of this game is to build up your ability to recognize the parts that make up both simple and complex Chinese characters. These character parts can help you remember a character that you have already learned, or even predict the meaning of a new character. The player's task is to collect a family of characters, a group that belongs together because all the members have a certain character part in common.

In order to score points, the player uses the mouse to control a moving dragon on the stage that can swallow friendly Chinese characters. However, there are enemy characters that do not belong to the family, and the player must swipe the enemies with the dragon's tail or shoot fireballs at them. Otherwise, the enemies will touch the dragon, causing the dragon to lose a part of its body and the player to lose points as well. A score area allows the player to track the progress of the game; it is always more fun and exciting to gain higher points as one learns more. Please see our online demo:

URL: www.clalive.com/game.html.

As an example of the advantage of ActionScript 3 is that it is more intuitive to delegate actions to the objects that should perform them, such as the code updating the entire dragon by calling the respective update methods of the parts with only the information they need.

```
// update all the dragon body parts
public function update(xPos:Number, yPos:Number):void
{
    // update the head first, based off mouse position
    parts[0].update(xPos, yPos, maxSpeed);
    // set head on top of everything else
    setChildIndex(parts[0], numChildren -1);
    // update the body parts next, utilizing the current position
    // of the preceding part
    for (var i:Number = 1; i < currentBodyParts; i++)
    {
        parts[i].update(parts[i - 1].x, parts[i - 1].y,
            parts[i - 1].prevRot);
    }

    // update the tail
    parts[maxBodyParts - 1].update(parts[currentBodyParts - 1].x,
        parts[currentBodyParts -1].y,
        parts[currentBodyParts -1].prevRot);
    // set tail on top of everything but head
    setChildIndex(parts[maxBodyParts - 1], numChildren -2);
}
```

Another significant advantage is that it's promoted to use strong typing, such as below:

```
private var xSpeed:Number;
private var ySpeed:Number;
private var maxRot:Number;
private var power:Number;
private var thrust:Number;
public var dHead:Bitmap;
```

rather than the usual style with ActionScript 2:

```
var xSpeed;
var ySpeed;
var maxRot;
var thrust;
var dHead;
```

The inheritance hierarchy of ActionScript 3 is significantly more of a hierarchy, whereas much of the previous versions were simply under MovieClip:

```
import mx.core.FlexSprite;  
import flash.text.TextField;  
import flash.text.TextFormat;  
import flash.display.Bitmap;  
import flash.display.BitmapData;
```

I deeply appreciate Computer Science department chair Dr. Ken Louden's arrangement of a special talk on "New Computing Technologies and Creative Learning" by Dr. Kai Chu, Professor of Humboldt State University and Dr. Eileen Moy, President of Us Asia Internet in April 2009. After attending the talk, I met the speakers and was selected for this internship.

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