

Image Viewer

Topics Covered
Background on Image Viewers
Available Applications and Widgets

Design of An System
Displaying Student Home Pages
Design Methodology
flowLayout.php
PHP Read XML
imageGallery.php
CSS/JavaScript sliders

<http://cim.saddleback.edu/~tdedonno/snapShots>

Outline



① Background & Image Guidelines

② Applications & Existing Image Viewers

- GIMP, Fireworks, & PhotoShop
- Linux ImageMagick
- GPL Image Gallery CMS
- JavaScript and ActionScript Viewers

③ Example Student Web Sites Gallery

Background

Viewers
Image Gallery
Light Box – Slide Show
Image Gallery Functionality

Image Gallery



- Collection of Related Images
- Global View (view most or all Thumbnails)
- Medium Size Image intermingled w Content
- Mechanism Full Size Image in Pop up window
 - Dedicated Javascript Window w Slider
 - Sometimes switch to Light box or slideshow

Light box & SlideShow



SADDLEBACK
COLLEGE

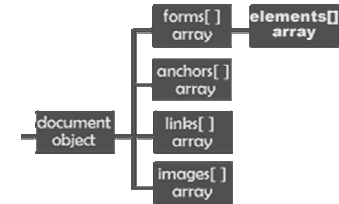
- Light Box
 - Overlay Image Div On Top of Web Page
 - Often Set Main Page to Transparent
 - Lightbox 2.0 jQuery JavaScript Code
- Slide Show
 - JavaScript setInterval Function
 - JavaScript Image Array, Increment Pointers
 - Popular but often Distracting on Main Page

Image Gallery Functionality



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- Main Image Div – Holds Full Size Image
 - `document.images[0].src = imageArray[i]; // or`
 - `document.getElementById("mainImage").src = imageArray[i];`



- Thumbnail Div Block
 - Scroll Thumbnails
 - `document.getElementById("sliderWin").scrollLeft = newValue;`

Background

Image Guidelines
Popular Formats
Save Originals at Hi Res
Web Sizing

Universal - Compressed



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- BMP are too Big
- JPEG A Okay, Color Compression
- PNG A Okay, Hybrid
- GIF is Popular

Images



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- Create Thumbnails Ahead of Time
 - Fireworks, Photoshop, GIMP, ImageMagick
 - Lots of Disk space
 - Ample Bandwidth But Be BW Concerned
 - For Small Set Just Let Browser Resize To Thumbnails
 - BW Inefficient to use Same Image Twice (small/large)
- Main Div Viewer
 - Flexible for Image Size or
 - Want Fixed Size Images or Block with Set Size
 - Don't Redraw Screen or Jumpy Web Page
 - Save Originals at Hi Res – Resize for Web

Image Size



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Access to Original Images

- Extensive Editing save as RAW Format
- Save at Highest Resolution Possible
- For Web Resize to Just Right 640x480 .. 800x600
- Cell Phone Camera Typically 1..4Mpixel

Camera	Resolution	Photo Quality Hard Copy
Web Cam	320x240 640x480 .3 Megapixel	
2 MegaPixel	1600x1200	5x7
4 Mega Pixel	2250x1680	8x10
8 Mega Pixel	3264x2448	16x20

Monitor Versus Image Size



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	Various Images Sizes			
Monitors	640x480	800x600	1024x768	1280x1024
1024x768	39%	61% (too big)	100%	167%
1600x1200	16%(too small)	25%	41%	68%
1920x1080	15%	23.2%	38%	63%

Thumbnails covering 50%of Screen					
Monitors	50x50	120x100	200x200	300x300	400x400
1024x768	18(too small)	8	4	3(too big)	2.2
1600x1200	28	12	6	4.7	3.5
1920x1080	30	13	7.5	5	3.75

Main Players



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- BK cheat Using McDonalds Marketing
- EBay/Amazon Should Be The Experts
 - Click To Get Full Size
 - Ebay Shows Just Image, Amazon Enlarge Viewer

	Thumbnails		Images	
	Slider		Part of Page	Stand Alone
Amazon	30x30	60x60	280x280	400x400
Ebay		60x80 80x60	280x280	400x400
RedFin		80x60	200x200	640x480

Using JavaScript to Check Browser Size



```
<script type="text/javascript">
if (window.innerWidth) //exists in Firefox
Use window.innerWidth, window.innerHeight
(document.all) //IE 4+
document.body.clientWidth,
document.body.clientHeight
```

- Can Set Sizes Relative Screen Size
- In IE clientHeight not Reliable
- Samples screen.html

Size Summary



- Save Originals at Highest Resolution Possible
- Small Set (2-5 Images) Let Browser Resize
 - BW inefficient to Download Same Image Twice (big and small)
- Larger Set Create Thumbnails Ahead of Time
- Leverage Off Amazon and Ebay
- Thumbnails
 - 30x30 ... Sweet Spot 80x80 Range
- Image Viewer w Other Content
 - 200x200 ... 300x300
- Stand alone Viewer
 - 400x400 ..(sweet spot).. 640x480 .. 800x600 (Monitor)
 - Depends on What You are Showing

Gallery Applications

Applications
GPL Image CMS
JavaScript & ActionScript Widgets

Applications



- ◆ GIMP
 - Open Source, Good Choice
- 🕒 PhotoShop
 - Resize, Target Images for Web
 - Build in RAD Tool Creating Image Gallery
- Fireworks
 - ♣ Run Batches, Create Thumbnails, Add Background
- ♣ Bridge Tools ◇ Fireworks, Tools ◇ Photoshop
 - ♣ But Fireworks, Photoshop must be installed
- | ImageMagick – Command Line/API, GPL Galleries

GIMP

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- Gnu Image Manipulation Program
- Open Source PhotoShop Alternative
- Can Batch to Add Watermarks
- Gimp Gallery Add-on
 - <http://www.skylab.org/~plumpy/gg/>
 - <http://gimpgallery.net/>
- Lots of Other Add-ons
 - <http://software.informer.com/getfree-gimp-2.6-make-web-gallery/>

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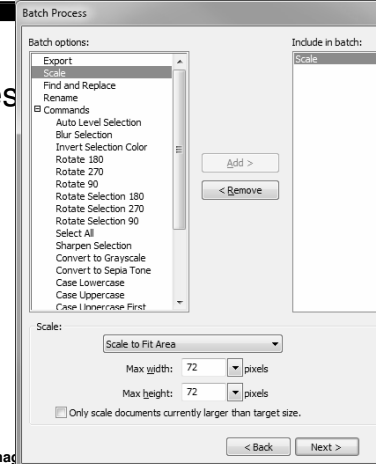
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Fireworks: Adobe Batch Processor

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- File → Batch Process
- Select Folder w Images Or Images Collection
- Use Add Select Batch Options
- Set Output Folder Creates the Images



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Image

PhotoShop – Image Gallery

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- Can Create Image Gallery
- File → Automate → Web Photo Gallery
- Choose a Photo Gallery Style
- Enter Email Address
- Select Source Files,
- Choose Destination
 - Photoshop Places Images/HTML in Destination

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ImageMagick

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- SW to Create, Edit or Compose Bitmaps
- Command Line Execution (Linux Batch File)
- Integrated with PHP, Java or C
 - PHP Libraries Can Add and Alter Images
 - Cim has GD (Dynamic Graphics) PHP Library
- Convert, Crop, Resize, Change File Type
- Add Text, Special Effects
- <http://www.imagemagick.org/script/examples.php>
- *I use it to create gallery thumbnails in Linux Batch File*

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Open Source Galleries



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- PHP/MySQL Image CMS Galleries
 - GD or ImageMagick Library
 - Content Management System
 - Create Users – Attach Comments to Images
 - Can Automatically Upload Content (FTP images)
- 4Images
- Coppermine
- Gallery 2.3 (Gallery Remote)

Existing JavaScript Galleries



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- http://www.bigresource.com/scripts/JavaScript/Image_Effects/Image_Display.html#
- <http://www.javascriptkit.com>
 - cim269a Ken Bellis Review
[backbox](#) LightBox & [Multi-image](#) Slide Show
- Based on JavaScript Frameworks...
<http://tutorialblog.org/12-javascript-image-galleries/>
- In Future Cover jQuery in cim269b

Flash/ActionScript Image Galleries



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- More Glitter than JavaScript
- Want Flash to Use XML File
- <http://mrsteel.wordpress.com/2008/01/08/flash-image-gallery-example-actionscript-2-using-php-to-list-images-from-folder/>
- Tutorial Set
<http://speckyboy.com/2009/05/28/10-sleek-and-professional-flash-image-gallery-tutorials/>

Student Website Gallery

Snapshots of Student Website,
Categorized by Class
Specs, HLD, Divide & Conquer
Prototype Proof of Concept
Reusability/Maintenace

Student Website Gallery



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- Specifications – Define Problem
 - Identify Unique Concerns, Goal Reusable/Maintained
- Good High Level Design
 - Specify in English how you Plan to Solve Problem
 - Sketch Diagram of Your Plan
- Divide and Conquer
 - More Detailed Flow Charts - Sketches
 - Want Mutually Exclusive Parts
 - Combine Building Blocks (House, Auto, Lego)
 - Still Stuck – Break Apart and Simplify Specs

Define Problem



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- 1) Create Student Home Pages Snap shots
 - Later on More Specific CSS Design & Portfolio
- 2) Display snap shots relative specific class
 - Add Meta Data, rollover student name details
- 3) Flow Layout & Image Gallery Viewer
 - Click Image go to Student's CIM Page

English Solve Problem



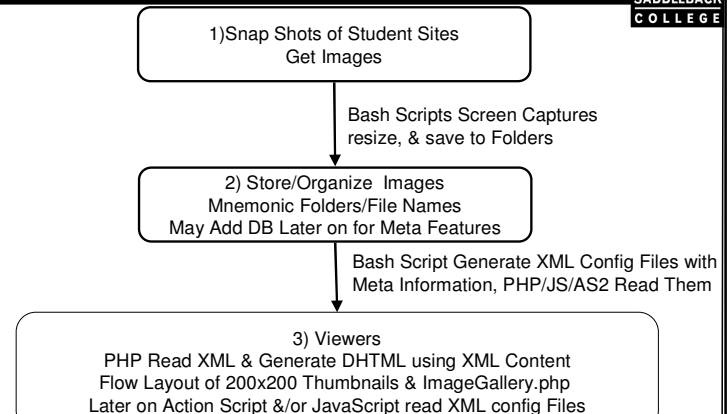
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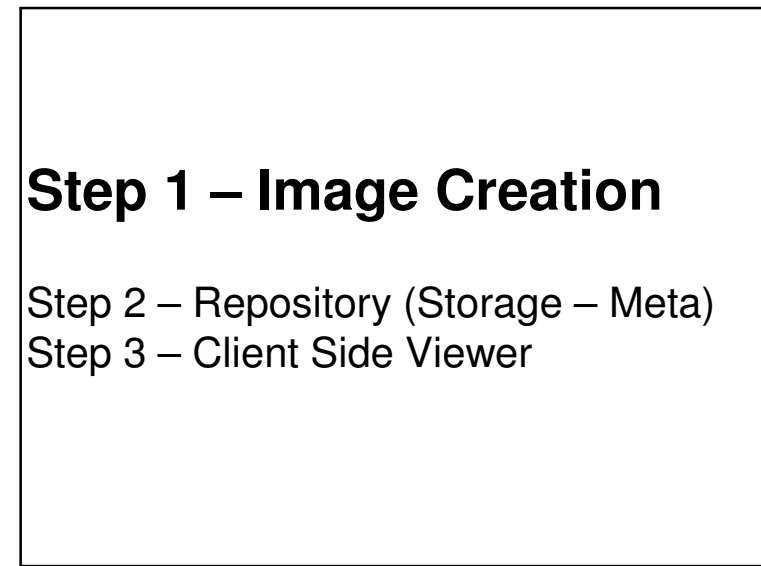
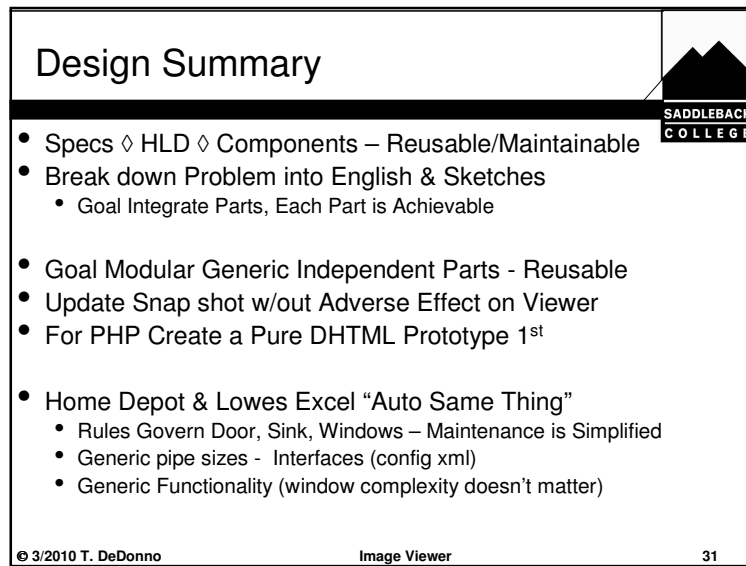
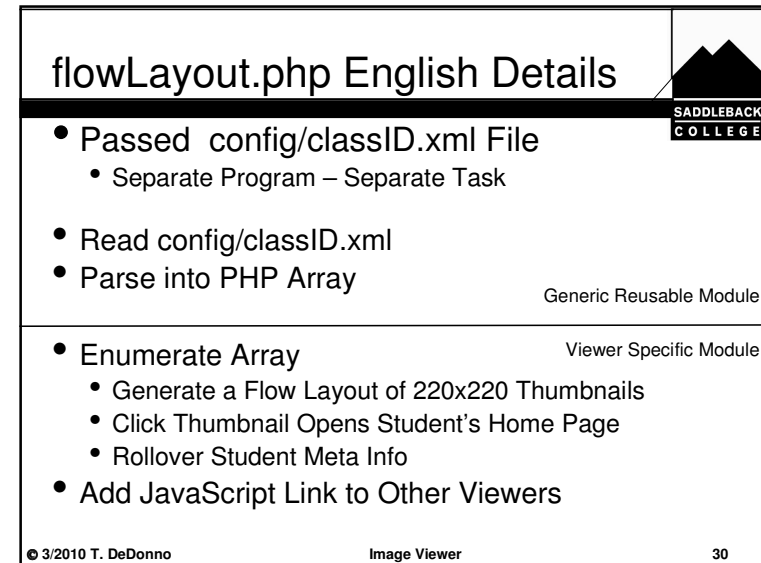
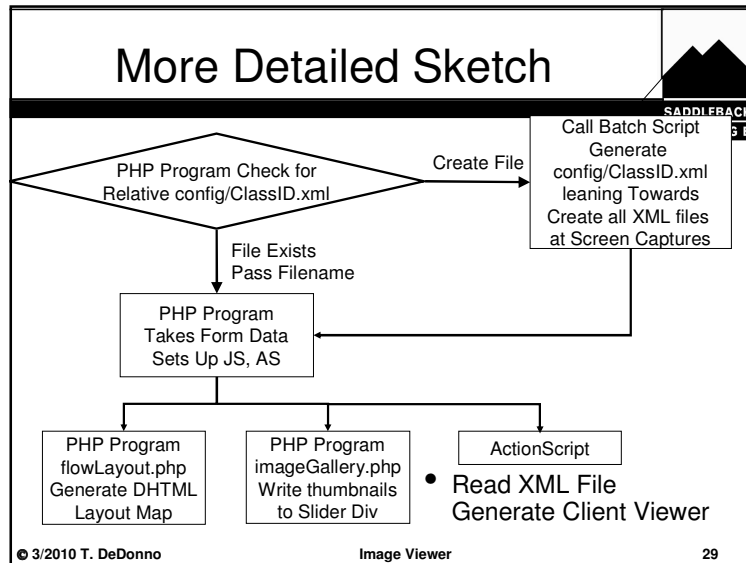
- Automated Program for Taking Screen shots
- Save Screen Shots to Folders
 - Automated Batch Process for Resizing
- Use mnemonic names to identify owner
- Group thumbnails by Class
 - Separate program creates config xml files Relative Class
- PHP Program get relative config xml file name
 - Reads Configure File generates DHTML
 - One Could Generate JavaScript Array
 - Then JS Viewers use Array "Wrapper Function"

High Level Sketch – Flow Chart



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Taking Website Snapshots



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COLLEGE

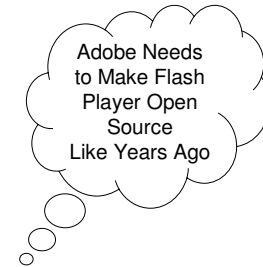
- browserShots.com (Shot Factory)
 - Flash Compatible, without Monitor?
- Layout Engine:
 - Render CSS/XHTML – Can Call Javascript Engine 1st
 - Webkit (used by Safari, Chrome and DW CS4)
 - Gecko (All Mozilla SW: Firefox, SeaMonkey, etc.) ; IE Who Cares
 - http://en.wikipedia.org/wiki/Comparison_of_layout_engines
- Ideally Web Browser w Screen Snap Shot
 - Browsers Have Dropped Remote Executions
 - Layout Engines Don't have Flash &/or Java Applet Support

Student Site Snapshots



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- Bash Script Enumerates Class Sites
- Python QT Webkit to Capture Sites
 - Default Size of Site
 - Save as original/sbusername.png
- Kludge, Use Firefox w 2 Sec Delay
 - Capture Missing Flash Pages
- Future Work:
 - Incorporate Flash Player add-on
 - Take Snapshots of only changed pages
 - **Some Files are not Capture (short rollover Comments)**
 - Automatic Offline Screen Captures, Ghostscript Layout Engines?
 - Facility to Handle Missing Web Pages (404 Error)



```
#!/bin/bash -v Bash Script Perl is More Popular
original="thumbnails.original"
rm $original/*
```

1) Bash Script Create Image



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```
for i in `cat users.txt`
do
  ./webkit2png.py http://cim.saddleback.edu/~$i > $original/$i.png
done

# add-on is a separate program, so webkit has no flash player plug-in

let cnt=0 #Missing captures needs Work
for i in `file $original/*.png | grep data | awk -F: '{print $1}'`
do
  u=`basename $i .png`
  firefox http://cim.saddleback.edu/~$u
  sleep 2
  xwd -root -silent -out screen.xwd
  convert -crop 800x600+0+160 screen.xwd $original/$u.png
  ((cnt++))
  if [ $cnt -eq 5 ]; then
    echo "close firefox windows"
    let cnt=0
    sleep 15
  fi
done
tar zcf original.tar.gz $original/*.png
```

Step 1 – Image Creation

**Step 2 – Repository
(Storage – Meta)**

Step 3 – Client Side Viewer

Create Repository



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- Folders Relative File Size
- Mnemonic Folder and File Names
- ImageMagick Batch Script Will..
- Resize to 120x100 Images
 - thumbnails.120/sbusername.png
- Resize 220x220 Images Map Layout
 - Thumbnails.220/sbusername.png

2) Batch Script Store Images



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```
#!/bin/bash -v
original="thumbnails.original"
function createThumbnailFromFile()
{
#Can write Username onto the Snap shot
#convert -font helvetica -fill blue -draw "text 0,500 ${2}" $original/$1 snapName/$1
convert -thumbnail 640x460 $original/$1 thumbnails.640/$1
convert -thumbnail 220x220 $original/$1 thumbnails.220/$1
convert -thumbnail 120x100 $original/$1 thumbnails.120/$1
}

rm thumbnails.640/* thumbnails.220/* thumbnails.120/*

for f in `ls $original`
do
    createThumbnailFromFile $f
done
```

Storing Images - Repository



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- Using Folders
- But Can Store Images in Database
 - MySQL Data Type blob – large binary Object
 - CMS Store all Data (Images+Text) in Database/Tables
- Database Advantages
 - Can Attach Comments to Images
 - Aka Guest Book for Each Image
 - At this level consider GPL/Open Source Gallery May Implement for Portfolio or CSS Designs
- Goal Change Extraction – Independent Viewer

Glue config xml File



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- File Name Identify Students
- Bash Script Determines Students in Class
 - Creates config/ClassIdentifier.xml File
 - File Includes Meta Information
- Meta Information
 - Extracting it From OS - Classes Enrolled
 - Do have a studentInfo DB
 - In General DB Enables Superior Meta Info

Summary Folder Structure



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- Bash Script Creates config/xml Files
- snapShots/
 - config/holds config Files Relative Class
 - thumbnails.120/
 - thumbnails.220/
 - flowLayout.php?config=...&size=medium
 - imageGallery.php?config=
 - readXML.php hold readConfig Function
 - index.php Index File for Folder

Step 1 – Image Creation

Step 2 – Repository (Storage – Meta)

Step 3 – Client Side Viewer

flowLayout.php
config/ClassID.xml
PHP Libraries Read XML
imageGallery.php
Use Same Pre-Code as flowLayout.php
but places thumbnails in slider

cim.saddleback.edu/Professional flowLayout.php



SADDLEBACK
COLLEGE

- Select Thumbnail Radio Button
- Uses Relative config XML File

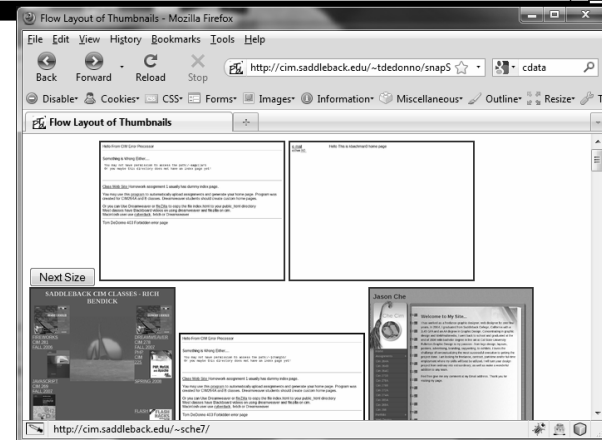
For Each Student in Class Create...

```
<a href="http://cim.saddleback.edu/~jbruck1" >  
<img class="box"  
src=  
"http://cim.saddleback.edu/~tdedonno/thumbnails.220/jbruck1.png"  
title="BRUCK JEFFREY ANDREW: cim225Spring10 cim269aSpring10" /></a>
```

Flow Layout Output



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config/ClassIdentifier.xml



```
<?xml version="1.0" encoding="UTF-8"?>
<files large="thumbnails.640/"
        medium="thumbnails.220/"
        small="thumbnails.120/" >
<file icon="sbusername.png"
        author="Name"
        press="/~sbusername/"
        rollOver="Comment Field" />
<file ... />
</files>
```

- Previous ActionScript Format I Used (newCim, xmas)
- Common More Nested Tags Less Attributes
- Always Follow XML Guidelines
http://www.devguru.com/Features/tutorials/XML/beginning_xml.html

flowLayout.php



- PHP passes config FileName to flowLayout.php
- Read XML Config
- Parse XML Data <file>
 - Ignoring the First <files> Tag
 - Parse XML Data into Array, Keys will be Property Names

Generic Reusable Module

- Enumerate Array Create Each HTML Image Element
- JavaScript To Change Thumbnail Size

Viewer Specific Module

JavaScript Change Size



```
<script type="text/javascript">
/*  */
// sizes in descending order – should get this from &lt;file XML&gt;
var sizes = new Array( "640", "220", "120" );
function getCurrentSize() {
    var j=0;
    while( j &lt; sizes.length &amp;&amp; images[0].src.search( sizes[j] ) &lt; 0 ) ++j;
    return j;
}

function nextSize() {
    images = document.getElementsByTagName( "img" );
    j = getCurrentSize();
    var k = ( j &gt;= sizes.length-1 ? 0 : j+1 );

    for( i=0; i &lt; images.length ; ++i )
        images[i].src = images[i].src.replace( sizes[j], sizes[k] );
}
/* ]&gt; */
&lt;/script&gt;
...
&lt;input type="button" value="Next Size" onclick="nextSize();" /&gt;</pre></div><div data-bbox="105 860 180 873" data-label="Page-Footer"><p>© 3/2010 T. DeDonno</p></div><div data-bbox="268 860 318 873" data-label="Page-Footer"><p>Image Viewer</p></div><div data-bbox="432 861 444 873" data-label="Page-Footer"><p>47</p></div><div data-bbox="563 535 794 591" data-label="Section-Header"><h2>PHP Code Read Config Enumerate Each Student</h2></div><div data-bbox="840 591 889 614" data-label="Image"><img alt="Saddleback College logo"/></div><div data-bbox="551 615 804 852" data-label="Text"><pre>if( count( $_GET ) &lt; 1 || ! array_key_exists( 'config', $_GET ) )
    die( "Need config File name" );

include( "readXML.php" ); //Reusable Module Set

$students = readConfig( GET[ 'config' ] );

$size=220;
$folder="thumbnails.220/";

foreach( $students as $s )
{
    echo '&lt;a href="'. $s[ 'attributes' ][ 'press' ]. "'";
    echo ' title="'. $s[ 'attributes' ][ 'rollOver' ]. "' &gt; '";
    echo '&lt;img class="box" src="'. $folder. $s[ 'attributes' ][ 'icon' ]. "'";
    echo ' alt="'. $s[ 'attributes' ][ 'rollOver' ]. "' /&gt;&lt;/a&gt;\n";
}
?&gt;</pre></div><div data-bbox="532 859 610 873" data-label="Page-Footer"><p>© 3/2010 T. DeDonno</p></div><div data-bbox="692 860 747 873" data-label="Page-Footer"><p>Image Viewer</p></div><div data-bbox="859 861 877 873" data-label="Page-Footer"><p>48</p></div>
```

PHP XML



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- XML Supported by All Main Languages
- Read File & Parse XML
- PHP Full set xml_Functions
- Php.net/simpleXML Simple/Easy
-
- Add xslt for Style – XML Presentation
 - Could add xslt as Flow Layout Alternative

Using XML in PHP



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Will be Parsing Data into an Array
Lot of Work with XML, can Parse into Class

Read XML File Contents

Use xml_functions

```
xml_parser_create( ' ' );  
xml_parser_set_options( ... );  
xml_parse_into_struct( ... );  
struct is a predecessor or Class
```

Optional PHP Class



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```
class Icon {  
    var $icon;
```

```
    var $x;          var $y;  
    var $depth;     var $rollOver;  
    var $author;    var $duration;  
    var $press;     var $useAuthor="true";
```

```
<?xml version="1.0"  
encoding="UTF-8" ?>
```

```
function Icon( $a )
```

```
{  
    if( is_array( $a ) )  
        foreach( $a as $k => $v )  
            $this->$k = $v;  
    else {  
        $this->rollOver = $this->press  
            = $this->icon = "";  
        $this->duration = $this->x  
            = $this->y = 0;  
        $this->depth = "next";  
        $this->author = $a;  
    }  
}
```

```
<files ...
```

```
<file  
icon="sbusername.png"  
author="Name"  
press="/~sbusername/"  
rollOver="Comment Field"  
/>  
<file ... />  
</files>
```

readXML.php



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```
function readConfig($__url)
```

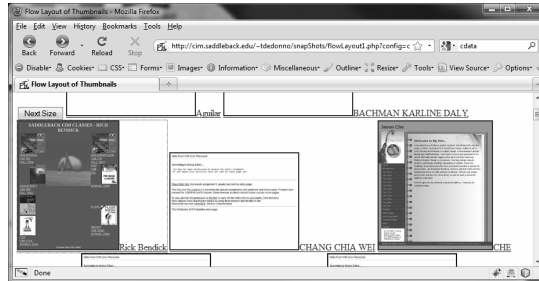
```
{  
    $xml_values = array();  
    $contents = file_get_contents( $__url );  
  
    $parser = xml_parser_create("");  
    if( !$parser ) return false;  
  
    xml_parser_set_option($parser, XML_OPTION_TARGET_ENCODING, 'UTF-8');  
    xml_parser_set_option($parser, XML_OPTION_CASE_FOLDING, 0);  
    xml_parser_set_option($parser, XML_OPTION_SKIP_WHITE, 1);  
    xml_parse_into_struct($parser, trim($contents), $xml_values, $tags );  
  
    if (!$xml_values) return array();  
  
    $i = 0;  
    foreach ($xml_values as $data) //Write Directly to Array Know Indexes  
        if( $data['tag'] == 'file' ) $xml_array[ $i++ ] = $data;  
  
    return $xml_array; //Array keys are [0..students][ 'attributes' ][ xml attribute property names ]  
}
```

Refinement flowLayout1.php Add Username



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- Insert Author (Username) inside `<a>..`
- Later on CSS to Overlap Image



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Typical Gallery Viewer



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- Single Image Preview & Thumbnail Slider
- mouseover Thumbnail Swap Preview Image
- Click Preview/Thumbnail Full Size in Light Box

- Never Want Two Vertical or Horizontal Scroll Bars
- Exception Thumbnail Slider

- **Create a Thumbnail Slider**
 - 1) Use CSS to add Scroll Bar to Div & Add JavaScript
 - 2) Two Div Blocks, Use JavaScript to Move Inner Content

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galleryViewer.php English



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- Pass config xml FileName
- Parse XML file into PHP Array

Generic Reusable Module

- JavaScript Functions
• `swapImage(mainImage, w Thumbnail)`
• `moveSlider(increment)`
- Use CSS to Create a Slider w Scroll Bar
 - Other Window and Content Div, move content w JS
 - 3-5 Thumbnails Just Skip Scrolling

- Enumerate PHP Array
write DHTML nodes into slider div

Viewer Specific Module

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imageGallery.css



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```
#slider {
  height: 130px; /* Height Only One Row */
  width: 480px; /* fit 5 Thumbnails */
  overflow-x: auto; /* add scroll only if needed */
  display: inline-block; /* inline block has height & width */
  white-space: nowrap; /* want one long line */
}

.thumbnail {
  padding-right: 10px;
  height: 90px; width: 90px;
  margin-top: 10px;
}

/* center entire page no top,bottom margin */
body { margin: 0 auto; text-align: center; }
```

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Image Viewer

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```
function moveSlider( increment )
{
    var slider = document.getElementById( "slider" );
```

```
switch( increment ) {
```

```
    case 0: case "start" :
        slider.scrollLeft =0;
        break;
    case "end" : case "finish" :
        slider.scrollLeft = slider.scrollWidth;
        break;
    default :
        slider.scrollLeft += increment;
        //w firefox engine scrollLeft stays in range
}
```

```
function swapImage( newImage, newLink )
{
    (document.getElementById( "mainImage" )).src = "thumbnails.640/" + newImage;
    if( newLink == undefined ) newLink = "/" + newImage.replace( ".png", "" );
    (document.getElementById( "mainImageLink" )).href = newLink;
}
```

imageGallery.js

Prototype: imageGallery.html DHTML Code for PHP

```
<a id="mainImageLink" href="/~aagahi0" >

</a>
```

```
<hr /> <!-- Note moveSlider can operate on any type of slider -->
<span onclick="moveSlider( 0 );">Beginning</span>
| <span onclick="moveSlider( -480 );">Page Back</span>
| <span onclick="moveSlider( -120 );">Previous</span>
| <span onclick="moveSlider( 120 );">Next</span>
| <span onclick="moveSlider( 480 );">Page Forward</span>
| <span onclick=" moveSlider( 'end' );">End</span>
<br />
```

```
<div id="slider" > /* add link or onclick in PHP */





</div>
```

```
<a id= "mainImageLink"
title="<?=$students[0]['attributes']['rollOver'] ?>"
href="<?=$students[0]['attributes']['press'] ?>" >

```

```
</a>
```

```
<hr />
<span onclick="moveSlider( 0 );">Beginning</span>
| <span onclick="moveSlider( -480 );">Page Back</span>
| <span onclick="moveSlider( -120 );">Previous</span>
| <span onclick="moveSlider( 120 );">Next</span>
| <span onclick="moveSlider( 480 );">Page Forward</span>
| <span onclick=" moveSlider( 'end' );">End</span>
<br />
```

```
<div id="slider" >
<?php
```

```
    foreach( $students as $s )
    {
        echo '<a href="',$s['attributes']['press'],'>';
        echo '\n';
    }
?>
</div>
```

imageGallery.php

Future Work

- Improve Snap Shots – **Especially Missing Images**
- PHP could Generate JavaScript Image Array
- Integrate Existing Viewer or Image CMS into System
- Flash/ActionScript Viewer using config XML
- JavaScript Can Read XML
- JavaScript class XMLHttpRequest();
- getElementById on XML File
- Parse XML File into DHTML
- http://www.w3schools.com/XML/xml_examples.asp

Viewer Summary



- Thumbnails 40x40 .. 80x80; Images 200x200..400x400
- Light Box – Pop-up Div on Top
- Slide Shows – JavaScript setInterval()
- Image Gallery
- Thumbnail mouseover Swap Image
 - document.getElementById('mainImage').src
- Use CSS for Slider, JavaScript scrollLeft Property
- Lots of JS Viewers
- Image CMS : Image4, Coppermine, Gallery 2.3

Design Summary



- Specs → HLD → Modular Components
- Define Problem – Put Specs in Your Words
- Sketch a Good High Level Design
- Divide and Conquer
 - Break Up HLD Into components
 - End Task is Just Integration
- Build Prototypes First – The Military Does