

Intelligent HTML Code Analyzer and Builder from PSD Layers

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Abstract- Intelligent HTML (HyperText Markup Language) Code Analyzer And Builder From PSD (PhotoShop Document) Layers' generates the HTML code from PSD designs automatically. This system mainly focuses on developers. It reduces the time which is utilized for making HTML codes from PSD designs. It produces Image Cropping, HTML Coding, and CSS (Cascading Style Sheets) coding and Final Compression within in short time. This system generates HTML, CSS files with corresponding codes and arranged in a web standard. Each and every layers of PSD are processed through several passing methods and analyzing the relations of parent and children of layers. This relation gives the hierarchical coding pattern.

Index Terms- Auto Coding, HTML Converter, PSD to HTML, Code Generator.

I. INTRODUCTION

The PSD file is Photoshop format contained with several image layers. HTML is a coding language that is used to display web pages. Generally, the primary designs are made with Photoshop in PSD format and then converting into HTML Code Manually. An HTML file is connected by different referencing image files, script files and CSS file. CSS can be written inside or outside of an HTML file.

'Intelligent HTML Code Analyzer and Builder From PSD Layers' will process the conversion of HTML Code from PSD designs automatically [1]. There is no direct relation between PSD and HTML. PSD is a pure image related format whereas HTML is a pure scripting format. Here it analyses the PSD layer positions and analyzing the relations between them. This relation is used to make HTML codes. The coding can be done in two ways. The first way is to relate one layer with previous layer. Another method is to connect the layers in a hierarchical structure. First one is friendly with jQuery and used to make HTML animations whereas the second one is used in dynamic or static pages.

The Journal consists following parts,

- 1) Abstract
- 2) Introduction
- 3) Existing System Study
- 4) Literature Survey
- 5) System Design
- 6) Implementation and Results

II. EXISTING SYSTEM STUDY

Manual coding is done by a human being. There is no automatic methods are used. The PSD file is manually cropped and scaled. After analyzing the design, coder will make a plan and start coding. Manual coding is trustier but time and cost consuming. Following are some existing tools that are used to convert PSD to HTML.

- 1) Traditional Photoshop Slicer.
- 2) psd2htmlconverter.com Online Converter
- 3) psdtoweb.de Online Converter

The Slice tool allows you to divide an image into smaller sections which fit together like a jigsaw (but with straight edges). The slicing lines are drawn manually.

psd2htmlconverter.com Online Converter is based on the instructions that we are given in the PSD layers. Most of processes are based on the naming of layers. Before proceeding, we have to select several options to build a code. Each Photoshop Layer group is converted into a div block in the resulting CSS HTML layout. Unite logical groups of elements (like header, content, footer, columns, etc) into Photoshop Layer Groups. It will help us to correctly unite CSS elements into HTML scalable div blocks (so if someone adds more text than it will still look fine). All elements of such markup will be grouped into rows and columns of HTML/CSS elements and they will be aligned relative to each other through such CSS properties as 'margin', 'padding' and 'float'. Perfect output code is depends upon grouping of layers. The hierarchy is building after analyzing the group structure in the layer group of PSD.

psdtoweb.de online converter do the html conversion from PSD file based on Position of layers. The x and y axis are analyzed and written in CSS file as a line by line format. Hierarchical result can't be produced by it. Line by line type coding is too confusing for the developers. The converter is receiving the PSD file, converting to position based code alone. The output HTML div's are arranged line by line. It can be used only for the jQuery type coding. It won't show properly in Dreamweaver type editing software.

III. LITERATURE SURVEY

HTML or HyperText Markup Language [2] is the main markup language for creating web pages and other information that can be displayed in a web browser. The purpose of a web

browser is to read HTML documents [3] and compose them into visible or audible web pages. The browser does not display the HTML tags, but uses the tags to interpret the content of the page. HTML elements form the building blocks of all websites. HTML allows images and objects to be embedded and can be used to create interactive forms. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. It can embed scripts written in languages such as JavaScript which affect the behavior of HTML web pages. CSS styles are used to control the properties of HTML elements.

A. General Structure of HTML Page

The first item to appear in the source code of a web page is the doctype declaration. This provides the web browser (or other user agent) within formation about the type of markup language in which the page is written, which may or may not affect the way the browser renders the content. It may look a little scary at first glance, but the good news is that most WYSIWYG web editors will create the doctype for you automatically after you've selected from a dialog the type of document you're creating. If you aren't using a WYSIWYG web editing package, you can refer to the list of doctypes contained in this reference and copy the one you want to use.

B. Cascading Style Sheet Rules

Cascading Style Sheets (CSS) [4] is a style sheet language used for describing the look and formatting of a document written in a markup language. While most often used to style web pages and interfaces written in HTML and XHTML, the language can be applied to any kind of XML document, including plain XML, SVG and XUL. CSS [5] is a cornerstone specification of the web and almost all web pages use CSS style sheets to describe their presentation.

C. Position Based Coding Rule

When the element is given a relative position, one can then shift the element horizontally or vertically with the top, bottom, left, right properties. Everything else in the page stays exactly where it was and acts like the element was never moved.

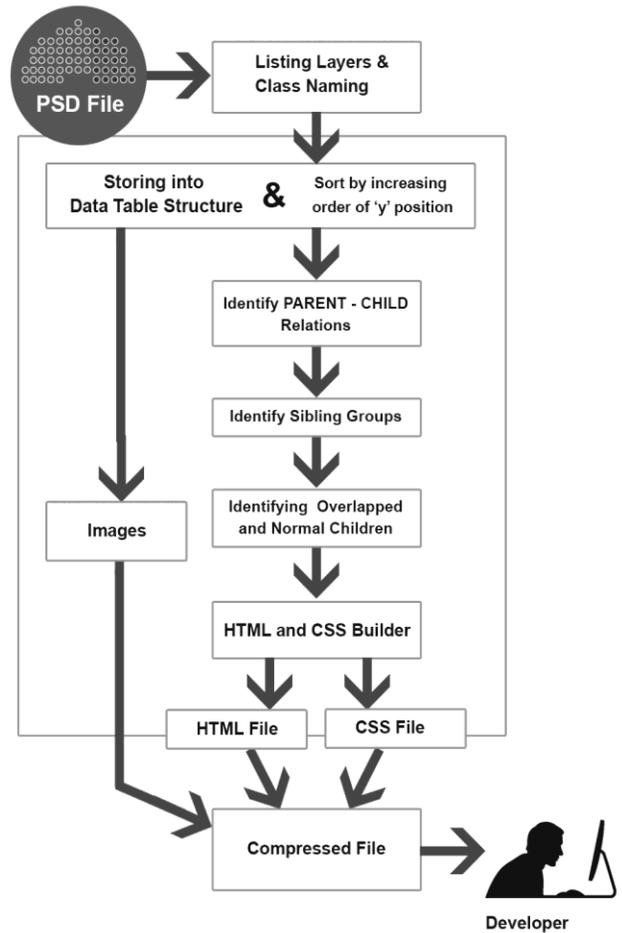
D. Overlapping DIVs

In normal HTML coding, DIVs are not overlapped. If one div is used, another one can be used right to it, left to it or under to it. But if we need to overlap to divs, we use position styles sheet property. The position has relatively connecting property value called 'relative'. The element is positioned relative to its normal position, so "left:20" adds 20 pixels to the element's LEFT position.

IV. SYSTEM DESIGN

PSD layer parsing is the first phase of the Hierarchical Method. After Parsing, layer list are analyzed and a unique name is given for each layer. The unique name is a combination of date and time with layer name. Unwanted characters are avoided from layer naming. The extracted layer is converted to PNG image and giving the same unique name

as file name. This same name is given for the CSS class name for identification. Default Data Table Structure is used to store the layer information. Then the list is sorted in the increasing order of top position. Another main function is to find the parent and child relations. After this analysis, we will get some uncategorized layers. These can be sibling or confused layers. The sibling layers are grouped and attached to a new parent layer. The very next stage is to generate HTML and CSS codes. Finally the HTML and CSS files are compressed to a zip file.



[Figure IV-1, Work Flow]

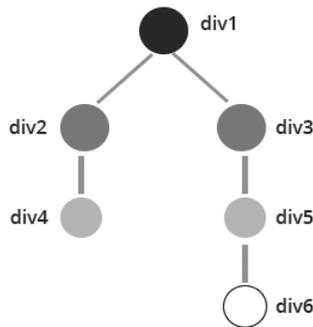
A. Hierarchical Structure - Design Considerations

In the Hierarchical Method, DIVs has relation with each other. If one DIV is inside of another, first one is called as parent and the second one is the child. This can be spread like in iterative manner.

The following are the basic design considerations in hierarchical rule.

- 1) One parent can hold more than one child. If this rule is not followed, the browser will show a wrong structure of web page.
- 2) If one DIV have more than one child, each one should follow same CSS float property.

3) In the case of overlapped layers, the position relative method can be used.



[Figure IV-2, Normal Hierarchy of DIVs]

B. General Symbol Table Design

The following is the base symbol table structure. The parser is parsing the PSD file and the layer information is analyzed. The name of layer is hashed with micro time for avoiding duplication.

Symbol Name	Usage
SaveName	Save name is the hashed name of layer
xposition	Value of x position
Yposition	Value of y position
LayerHeight	Height of the layer
LayerWidth	Width of the layer
xposition-xtended	Value of x position plus width
yposition-xtended	Value of y position plus height
Zindex	z axis value (order of layer)
Parent	Parent of this layer

[Table IV-1, General Symbol Table View]

The SaveName is hashed name of layer. xposition, yposition, LayerHeight, LayerWidth are saved from the PSD information list. xposition-xtended is the summation of xposition and LayerWidth. The layer is a rectangle structure. So, xposition-xtended is the last x position of the layer. Same way, yposition-xtended is based on the y position and the height of the layer. zindex is a digital value. It represents the order of layer. No two layer have same value. The parsing is

actually starting from zero to last value. Parent field is used for finding the relation between Parent and Child divs.

V. IMPLEMENTATION AND RESULTS

The implementation consists of different steps. The code is delivering in hierarchical structure.

- A) PSD Parsing and Image Cropping.
- B) Storing Layer Information and Position Based Sort.
- C) Parent-Child Relation Analyzing.
- D) Sibling Group Analyzing.
- E) Identifying Overlapped and Normal Children.
- F) HTML Code and CSS Code Generation.
- G) Compression

A. PSD Parsing and Image Cropping.

Program reads the PSD file format and analyzing the layer information. This process is called as PSD parsing. The parsing is done in bottom to top manner. The designer starts with background and the contents are added one over another. The very next process is to crop each of these layers with background transparency support. The layer information contains the pixel data and the properties of layer image. The system uses PNG-24 to save the image files with transparency.

B. Storing Layer Information and Position Based Sort.

For finding the relations between the layers, we need to store the whole information of layers. Generally, a PSD file parsing is giving very few information such as x and y position from the document, height, width details and order of layer. So these are stored into a Symbol Table structure. Symbol Table is limited but very easy to access compared to other data structures.

The actual layer order is the order that we extracted from PSD file. But we need to change the order of arrangement for the hierarchical structure. So the order is changed as in increasing order of y position. This will give a vertically increasing structure as we needed.

The parsing was done from bottom to top order and now we have changed the order from top to bottom manner. Why we do the bottom to top in the parsing is to get the order of overlapping layers. Overlapped layer is noted and avoiding the completely masked layers.

C. Parent-Child Relation Analyzing Algorithm.

For designing the Parent-Child Relation Algorithm, I have used 4 set of conditions.

DT1 and DT2 are Data Table 1 and Data Table 2.

i. Set 1

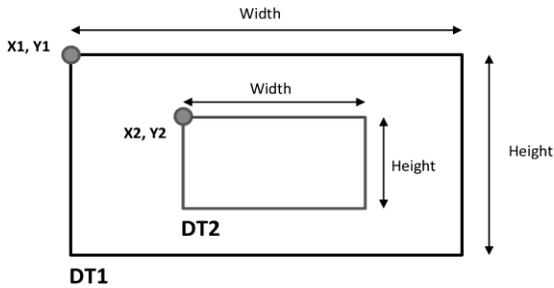
CONDITION 1:

$$(DT2.X2 < DT1.(X1+width)) \&\& (DT2.X2 > DT1.X1)$$

CONDITION 2:

$$(DT2.Y2 < DT1.(Y1+height)) \&\& (DT2.Y2 > DT1.Y1)$$

As per condition 1 and condition 2, Child is situated inside of Parent's area. Sometimes, Parent may be overlapped completely over the child. In this case, the child is discarded.



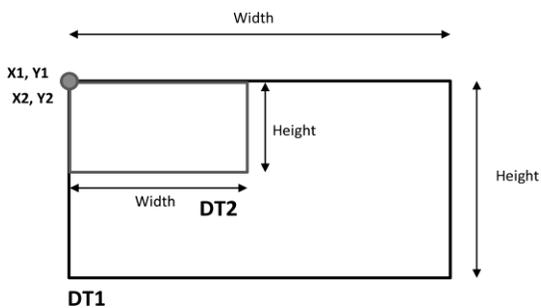
[Figure V-1, Set 1 - Condition1 and Condition2]

ii. Set 2

CONDITION 3:

$$(DT1.X1 == DT2.X1) \&\& (DT1.Y1 == DT2.Y2)$$

In condition 3, the x,y position of both are same. In this situation, if the order of DT2 is greater than DT1, DT2 can be considered as a child of DT1.



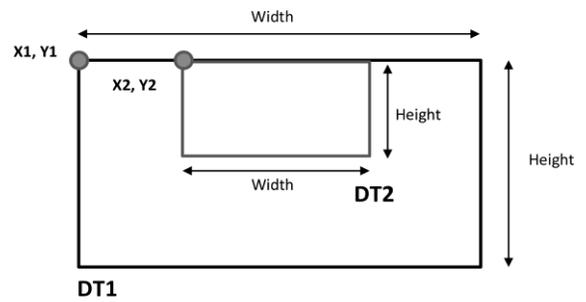
[Figure V-2, Set 2 – Condition3]

iii. Set 3

CONDITION 4:

$$(DT1.X2 > DT1.X1) \&\& (DT2.Y2 == DT1.Y1)$$

The condition 4 is denoting that the child is attached to the top of parent. In this case also we have to consider the order of layer. Higher order one become as child. The lower order one means that the second layer will be under the parent layer. That means the child layer will be hidden because of the parent is covering completely.

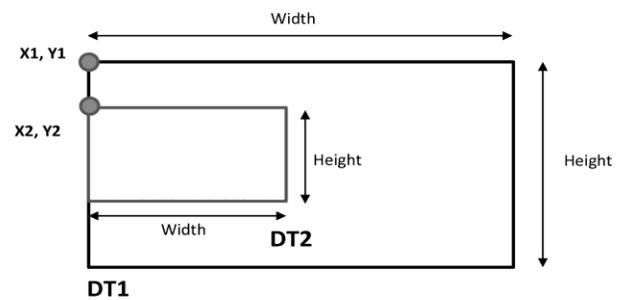


[Figure V-3, Set 3 – Condition4]

iv. Set 4

CONDITION 5:

$$(DT1.X2 == DT1.X1) \&\& (DT2.Y2 > DT1.Y1)$$



[Figure V-4, Set 4 – Condition5]

The condition 5 is denoting that the child is attached to the left of parent. In this case also we have to consider the order of layer. Higher order one become as child.

Parent-Child Identification Algorithm

1. Data Table DT1
2. Data Table DT2 = DT1
3. FOR each element in DT1 compared with DT2 excluding the same element
4. IF CONDITION 1 AND CONDITION 2 are TRUE
5. DT1.element is the parent of DT2.element
6. DT2.element.parent = DT1.element
7. IF CONDITION 3 is TRUE AND order of DT2 is greater
8. DT1.element is the parent
9. IF CONDITION 4 is TRUE AND order of DT2 is greater
10. DT1.element is the parent
11. IF CONDITION 5 is TRUE AND order of DT2 is greater
12. DT1.element is the parent
13. END
14. SymbolTable = DT2

D. Sibling Group Analyzing.

The SymbolTable is used to analyze the Sibling Group. Parent and Multiple child details are analyzed and store to a new Data Table Structure called ChildTable. This table details will helps to do the HTML and CSS coding.

Sibling Grouping Algorithm

1. Data Table SymbolTable

2. Data Table SymbolTable_copy = SymbolTable
3. FOR each element in SymbolTable compared with SymbolTable_copy
4. Skip the same element
5. SymbolTable.element of multiple children are identified
6. Storing both Parent and Child details to ChildTable
7. END

E. Identifying Overlapped Children Algorithm

The ChildTable is the input for finding the Overlapped and Normal Children. A flag is set in each row to know whether the element is Overlapped or Not.

CONDITION 6:
ChildTable_copy.(Y2+height) < ChildTable.(Y1+height)

CONDITION 7:
ChildTable_copy.(X2+width) < ChildTable.(X1+width)

Overlapped Children Algorithm

1. Data Table ChildTable
2. Data Table ChildTable_copy = ChildTable
3. FOR each element in ChildTable compared with ChildTable_copy
4. Skip the same element
5. IF CONDITION 6 AND CONDITION 7 are TRUE
6. ChildTable.element.child is a Normal Child
7. ELSE
8. ChildTable.element.child is an Overlapped Child
9. END

F. HTML Code and CSS Code Generation

The HTML Code and CSS Code Generation are almost same to as the Position Based Method but the logic is different. HTML Code and CSS Code Generation are done parallel. In Logic, no need of multiple passes. When the HTML code is generated, corresponding class and properties are also written. Parent-Child Relation table is studying and the Parent of children is collected from ChildTable.

General Algorithm

1. HierarchyCoderBuilder(InitialNode)
2. Writing HTML, CSS Codes to index and style file
3. FOR each element in ChildTable
4. Parent = ChildTable.element
5. IF Parent==InitialNode
6. Children List collected
7. HierarchyCoderBuilder(Children)
8. END

is generated, corresponding class and properties are also written.

Parent-Child Relation table is analyzing and relations are collected from Symbol Table. Corresponding HTML and CSS codes are written into index.html and styles.css files respectively. Finally compression process is there. CSS file, index HTML file and image folder is compressed and archived into a zip file. The default compression function is used to make the zip option. The file name of compressed file is hashed with date, time and folder name for avoiding duplication. This URL is given in the final page for downloading. The ZIP format may be suitable for the developer to get all together.

VI. CONCLUSION

This system reduces the time which is utilized for making html codes from PSD designs. This program can be executed very quickly. It can do 4 huge processes such as Image Cropping, HTML Coding, CSS coding and final compression within in a short time. The Hierarchical coding is obeying SEO rules and can be used for Static and Dynamic web pages. Position Based coding is mainly used for jQuery supported animation pages.

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