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Automation of Styling Conversion for Internet Resources

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Abstract
The article examines methods and tools for transforming styling for web resources. In modern web development, ensuring adaptive and correct display of web resources across different devices and browsers is one of the key requirements. One important aspect of this process is automating the conversion of styles to ensure compatibility with various platforms and optimize the user experience. The article discusses the main methods and tools used for automated CSS style transformation, as well as proposes an algorithm that effectively adapts styles for different browsers and devices. The development of such software tools contributes significantly to improving web development efficiency by reducing adaptation time and enhancing the quality of the final products.

Keywords
styling, internet resources, responsive design, automation, web development

1. Introduction

Modern web resources require constant adaptation and optimization to ensure an effective user experience. One of the main aspects of this adaptation is the correct display of styles across various devices, browsers, and operating systems. In this context, styling conversion for internet resources becomes an important stage in the web development process.

Website development often requires substantial time for design and color palette selection. Clients frequently lack a clear vision of the final site's appearance. The primary task of the designer is to meet the client's expectations, taking all details into account to create a quality product [1-2]. Preparing and formatting text materials for electronic publications differs from preparing printed versions. It's essential to consider the specifics of reading on a screen, including font choice, line spacing, and overall page composition.

2. Goal and objectives of the article

Developing software that automates this process can significantly reduce the time spent on manual style editing and make developers' work easier. The purpose of this study is to develop a software tool that automates the process of style configuration for web resources.

To ensure user comfort on a website, it is necessary to utilize all the advantages of the electronic format, such as using color in the design of text blocks and providing options for image enlargement. The presence of hyperlinks and relevant tooltips is also an important component. Working with color is one of the key aspects of the design process. The choice of color scheme should be based on the fundamental principles of color theory, taking into account the symbolic meanings and the impact of colors on user perception. Therefore, the purpose of this study is to create software that helps develop styling designs for internet resources.

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The main tasks are:

- Researching modern tools for style adaptation.
- Developing algorithms for automatic style transformation.
- Creating a user interface for configuring the style transformation process.
- Evaluating the effectiveness of the proposed software solution.

3. Selection of Graphic Formats for Web Resources

Overview of Modern Automation Tools. Modern tools such as Shopify, Contao, Wix, Webflow, and others facilitate web resource development by providing functionality for creating HTML code and configuring CSS. However, these tools have certain limitations, especially in terms of artistic design, which may require detailed knowledge of color theory and typography. To improve efficiency, new software solutions can offer greater flexibility in style adaptation, combining aesthetic appeal and technical compliance. For example, additional components in Cogear CMS and Contao provide specific features [3-4], but their functionality may be complex for beginners. Popular formats like GIF, JPEG, and PNG are standards for web graphics due to their properties: support for transparency, compression, animation, and progressive loading. PNG offers higher quality but has larger file sizes.

The main properties of graphic files important for use in the internet environment include the following:

1. Transparency: Allows images to vary in opacity, ranging from fully visible to fully transparent.
2. Compression: Reduces the size of graphic files by applying algorithms that decrease file size by processing pixels as a single group.
3. Interlacing: Enables preloading of images by displaying alternating rows, starting with odd rows, followed by even rows, allowing for a quicker overall visual impression.
4. Animation: Creates the illusion of movement through a series of sequential frames. For example, animated GIF files do not require additional browser plugins and can work on many devices.
5. Progressive Loading: Similar to interlacing, it displays an image in stages, initially loading a low-resolution version, followed by progressively higher-quality versions.

For web graphics, the most widely used formats are GIF and JPEG. Their multifunctional capabilities, such as high compression while maintaining sufficient quality for web pages, have established them as standards in the field of web images. The PNG format, available in two versions (PNG-8 and PNG-24), is also supported by browsers, but its prevalence on web resources is lower compared to GIF and JPEG (see Table 1).

Attitudes toward presenting web content are evolving, with new data formats and development tools emerging to support them. However, older formats (such as GIF and JPEG for graphics) remain quite popular. As shown in Table 1, they are supported by nearly all browsers, and most developers have extensive experience with them. It is important to use the correct format for specific purposes to balance image quality and file size. For example, one image in GIF format may take up more space and produce a lower quality result than in JPEG format, while for another image, the opposite may be true. However, for presenting raster images, PNG has become a better option [5].

New automation tools simplify the creation, management, and configuration of content, especially when it comes to color schemes and fonts, which are typically defined through CSS. Tools like Cogear, ImageCMS, and ReloadCMS offer powerful features for both large and small projects but require specific skills for artistic design according to modern design standards [6].

Table 4
Support for Image Formats in Different Browsers

Browser	JPEG	GIF	PNG	SWG	PDF	BMP
Chrome	+	+	+	part	+	+
Chromiun	+	+	+	part	+	+
Mozilla	+	+	+	part	-	-
Mozilla Firefox	+	+	+	part	+	+
Opera	+	+	+	part	+	+
Safari	+	+	+	part	+	+
Internet Explorer	+	+	+	part	-	+

Color selection and typography are critical to web design. The use of colors, such as complementary or triadic schemes, helps create a harmonious impression. Typography also plays an important role in ensuring readability and aligning with the website's theme. Automated algorithms can adjust fonts and colors according to the content.

4. Automating Design with Software

4.1. Title information

As part of the research, software with an intuitive graphical interface was developed, allowing users to easily customize website designs. With this tool, designers can quickly and efficiently change the style of web resources, creating harmonious visual solutions. The software supports choosing between dark and light themes, using a triadic color scheme based on the principles of the Itten color wheel. The main user page (see Fig. 1) can be divided into a workspace block and a user preview block.

A crucial stage is creating a software solution that automates the style transformation process for online resources. For this, an algorithm will be developed to analyze original CSS files, detect potential compatibility issues, and automatically generate necessary changes.

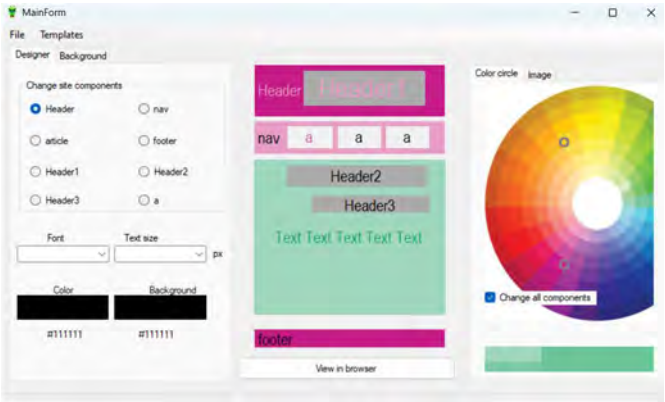
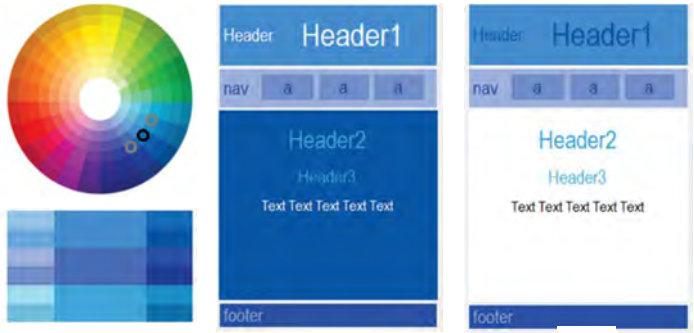


Figure 1: Main user Page.

Software for automating web design simplifies the work of designers by allowing them to quickly create visually consistent solutions. Using artificial intelligence and machine learning, programs can automatically suggest color and typography schemes that match the website's goals. The program supports theme selection (dark/light) based on the triadic color scheme of Itten, providing users with flexible configuration options (Fig. 2).

For the correct functioning of the software tool, the input HTML document should not have explicitly defined styles. It is also necessary for the HTML document to adhere strictly to the HTML 5 language standards for styling.



a. b. c.

Figure 2: Selected styles. a. – Selected colors, b. – Dark scheme, c. – Light scheme

To test the functional capabilities of the software tool, its performance was tested on various HTML pages. It was found that changing accent colors according to Itten's color schemes significantly affects the visual perception of a website, creating the necessary accents and mood. The research showed that the developed color schemes are universal and can be successfully applied to a wide range of websites with diverse content and target audiences.

5. Conclusions

Currently, the visual perception of information on the internet is directly influenced by the color design and typography. With well-chosen colors, it is possible to highlight key elements or hide less important information. Color and typography on web pages can be set using HTML (Hypertext Markup Language), specifically by forming the necessary CSS style sheet. While there are many software tools available for creating such style sheets, they lack the ability for artistic website design based on modern color theory.

Itten's color wheel demonstrates the most successful color combinations. Color schemes combining colors were examined, and a triadic color model was selected. This model provides more options for designing and highlighting key elements on a web page. Automating the style transformation process is an important step in simplifying the work of web developers and improving the efficiency of web resource development. The development of such tools has great potential for further improvement and integration with other web development technologies.

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