Visualizing and Exploring Picasso's World

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ABSTRACT
We discuss the preliminary use of a visualization tool called Interactive Timeline Viewer (ItLv) in visualizing and exploring a collection of art works by Pablo Ruiz Picasso. Our data set is composed by a subset of the On-line Picasso Project, a significantly-sized on-line art repository of the renowned Spanish artist. We also include a brief discussion about how this visualization tool can help art scholars to study and analyze an artist’s life and works.

Categories and Subject Descriptors
D.3.7 [Digital Libraries]; J.5 [Arts and Humanities].

General Terms
Design, Experimentation, Human Factors.

Keywords
Visualization, Picasso, Digital Libraries, Timelines.

1. INTRODUCTION
The On-line Picasso Project [4], is a Web-based collection hosted at the Department of Hispanic Studies at Texas A&M University. The collection can be divided into the following categories: a) A collection of more than 5000 photographs of Picasso’s artworks, each with information such as title, date, location where it was painted, medium, location where it can currently be found, and dimensions. b) A detailed biography of Pablo Picasso, including maps of the most important places related to his artistic life. c) A list of bibliographical references about Picasso’s works and life, and d) a collection of news and articles from newspapers and magazines related to Picasso. The on-line repository allows users to browse and visualize the items in the collection, which in turn helps them to explore and analyze in further detail its contents.

2. THE ON-LINE PICASSO DIGITAL LIBRARY
The current On-line Picasso Project provides a browsing interface, which has the following basic functionality: a) browse through a description of Picasso’s relevant events in his artistic life, b) browse through Picasso’s artworks, and c) view a list of museums and collections owning Picasso’s artworks. Entries in a) and b) are grouped by year, and each year is then divided into quarters. In the case of events in Picasso’s life, photographs of relevant people or places also are included. Places are presented within a labeled map indicating where he lived or worked. Images of the artwork collection are presented as thumbnails. Clicking on any thumbnail pops up a new window, displaying more detailed information about the artwork.

The browsing mechanism works fine for navigating through the artworks collection, but does not provide manipulations that can help users deepen their analysis. We are currently experimenting with ItLv [2], a Timeline-based visualization tool, to interactively explore and visualize the collection and prototype analyses of use to the art scholar.

2.1 Data transformation
Since the collection contains more than 5000 items, a subset of it was chosen for initial prototyping. The subset is composed of artworks created in the years 1907, 1908, and 1909.

An initial task in visualizing the collection was to regularize the sometimes idiosyncratic coding of dates. In the original descriptions, dates vary in format, for example “January/1907”, “Fall/1907”, “Early/1907”, and “Late Winter/1907”. Since the information was not uniformly stored and formatted, we applied a data-transformation algorithm that converted the dates into a numeric range representing the number of months beginning with January 1907. For example, January 1907 was assigned a value of 1, December 1907 a value of 12, and February 1908 a value of 14. Seasons were converted into month ranges, as shown in Table 1. Note that “Winter” spans two years. In most cases the encoding was unambiguous as to year(s), but when there was ambiguity we chose the beginning, rather than the end of the year (e.g., “Winter 1908” maps to months 12-14).

Table 1. Values assigned by the normalizing algorithm to the seasons of the years

<table>
<thead>
<tr>
<th>Season</th>
<th>Months</th>
<th>1907’s values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>Jun, Jul, Aug</td>
<td>6, 7, 8</td>
</tr>
<tr>
<td>Spring</td>
<td>Mar, Apr, May</td>
<td>3, 4, 5</td>
</tr>
<tr>
<td>Fall</td>
<td>Sep, Oct, Nov</td>
<td>9, 10, 11</td>
</tr>
<tr>
<td>Winter</td>
<td>Dec, Jan, Feb</td>
<td>12, 1, 2</td>
</tr>
</tbody>
</table>

Table 2 shows three additional transformation examples.
Table 2. Input data and its transformation.

<table>
<thead>
<tr>
<th>Input data</th>
<th>Meaning</th>
<th>Normalized value</th>
</tr>
</thead>
<tbody>
<tr>
<td>June~July/1907</td>
<td>Started in June and completed in July</td>
<td>[6-7]</td>
</tr>
<tr>
<td>Early/1907</td>
<td>Started early in 1907</td>
<td>[1-1]</td>
</tr>
<tr>
<td>Spring-Summer/1907</td>
<td>Started in Spring 1907 and completed in Summer 1907</td>
<td>[3-8]</td>
</tr>
</tbody>
</table>

2.2 Using ItLv

Once the data was transformed, we began our first visualization experiments using our ItLv application. Shneiderman [3], shows the use of a 2D visualization tool to explore a highly saturated space. He applies hieraxes to depict categories in further detail (represented as rectangles of the same size). Christel [1], uses timelines as part of an interface to a digital video library. In our ItLv representation, we represent the duration of the artwork’s creation by the length of the rectangle and depict additional detail in adjacent windows. This can be seen in Figure 1, which depicts the artworks made by Picasso in 1907 at three levels of detail. The main window (A) depicts the first level; an overview of the year 1907. The Y-axis corresponds to a selected category; in this case the attribute chosen was the medium in which the work was expressed. However, the user can select any defined attribute to be depicted in this axis. The X-axis corresponds to the months of 1907. Mousing over any of the categories in the main window will depict all the elements of that category in the bottom window (B); this corresponds to the second level of detail, and incorporates an algorithm that separates out the elements to avoid the overlapping that is necessary in window A because of the limited available display space.

Mousing over any of the rectangles in the bottom window will depict all the information for that entry in the window on the right (C). This information can be edited and updated. The last level of detail is provided by a pop-up window (D). The user can personalize this window by selecting only those attributes he/she is interested in analyze at any given time.

Note that a degree of uncertainty is expressed in some of the example dates. For example, “Spring-Summer/1907” does not tell us precisely which months are involved. In particular, the records are not as accurate for Picasso’s early artistic life, and hence the date ranges for some works are not known with certainty. In other cases, scholars believe, but do not know with certainty, that an artwork was painted in a certain city. We are currently experimenting with a color-fading scheme to depict uncertainty in date specifications, i.e., if one of the dates—start or completion—is not certain, it is depicted with a fading color, whereas if it is certain, a solid color is used.

3. CONCLUSION AND FUTURE WORK

We believe that ItLv’s functionality can help art scholars in exploring and analyzing an artist’s information in further detail, e.g., identifying patterns, discovering correlations, comparing series, or identifying trends in different years or decades. In fact, many Picasso scholars have pointed out the importance of seeing the correlation of Picasso’s series in the period from 1907 through 1914 in order to fully understand Picasso’s intentions. We believe that our visualization tool will demonstrate the correctness of their assumptions.

We expect to use ItLv to answer questions such as: What kind of artworks did an artist create during any given decade? Was there any trend in which he painted in two different decades? What kind of techniques did he/she use the most in any given year or season? Was he/she more productive during a particular season: summer, fall, spring, or winter? We continue to explore the usefulness of ItLv in providing insight on these questions and seek to discover what functionality can be added to the tool in order to broaden the range of questions it can help the scholar answer.

4. ACKNOWLEDGMENTS

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5. REFERENCES


