DreamVis: Visualizing Logged Dream Data

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ABSTRACT

We take a look at information visualization from a personal standpoint, creating a series of visualizations to explore the possibilities of more accessible representations of one's dreams. DreamVis is designed to make it more possible for people to examine and reflect on their dreams through the use of visuals. Most, if not almost all, dreams are forgotten within the first few moments upon waking. With DreamVis we open the set of personal visualizations, which have more commonly been used to visualize more concrete activities such as diet and exercise, to include more abstract and emotional data set within the context of their daily life.

Keywords: Information visualization, representing dream, personal informatics.

Index Terms: H.5.2 [Information Interface and Presentation]: user interfaces—graphical user interfaces.

1 INTRODUCTION

In this paper we explore visualizing personally kept dream logs. Our motivation started from our fascination with dreams and diaries and from the challenge of gathering and representing this type of subjective, qualitative data. Our questions started from wondering whether this is possible, to relating our dream logs to feelings during the day, to curiosity about creating an impression of an individual dream.

While we are all familiar with dreams as: "a series of thoughts, images, or sensations that occur in the mind during sleep" [2], we are also aware that multiple ideas exist about their meaning and/or purpose of dreams [8]. These range from ideas that they may be essential to memory and learning [10], that they have impact on our hormones [1], that they may express suppressed urges and impulses [5], or that they may offer insight into ourselves and our everyday lives [7]. However, while fascinating, dreams are often hard to remember even immediately upon waking and they rapidly become much harder to recall as time progresses.

There are many challenges when one considers visualizing dreams. There is the challenge of the data. Our memories of dreams are often fleeting, sometimes confused and nearly always incomplete. There is the challenge of visual representation of such subjective data and, because interest in dreams is usually in context of one's daily life, there is the challenge of relating these visual representations to one's daily life. Our goals are to:

- collect and categorize dream data,
- explore possible representations of this data, and
- situate these visualizations within everyday life.

We are interested in exploring dreams in context of everyday life, that is, do dreams affect one's daily life? Or are they affected by an individual's day-to-day life? This goal leads to such questions as: How can we represent dreams in a more tangible, understandable way? Is there any means to visualize dreams in a way that can be meaningful to an individual? This research relates to Personal Informatics, which is concerned with improving self-knowledge through the use of systems that help individuals collect personal information [9]. Today, there are a variety of tools and systems available that aid in personal data collection. There are also quantitative analysis techniques available such as UCSC's Quantitative Dream Content Analysis Techniques [4]. These techniques tend to use psychological constructs (i.e. motivation, personality), and statistical approaches to analyze and assess dream content. Using these methods interpersonal or cross-group comparisons can be made. DreamVis takes a more personal approach by providing a visual representation for dreams.

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2 DATA COLLECTION

While interest in collecting personal data has been growing rapidly with the Personal Informatics movement [9] and even though this has led to a plethora of personal data logging devices, at this point in time collection of data about dreams still requires keeping a regularly updated journal. There are lots of advice about how to keep a dream diary or journal [3], however, since it is personally collected it tends to be subjective, and the chances of inconsistent data logging are highly probable. For this exploration, the initial data collection tracked both dream-based and emotion-based data. Dream data was collected in the mornings and consisted of dream types, and the estimated emotional impact of the dream. Changes in emotion were logged hourly as well as within the hour whenever a significant change was detected. Additionally the percentage of time relating to an emotion was tracked. As a first pass in handling our dream data, we categorize the dreams based on the classification presented in Encyclopedia of Sleep and Dreams [1]: *daydreams* – occur at a level of consciousness between sleep and wakefulness; *nightmares* – disturbing dreams that may cause feelings of anxiousness and fear upon waking up; *false awakening dreams* – lead the individual to believe they have woken up and are going through their everyday routine, only to realize that they are still dreaming; *lucid dreams* – occur when the individual is aware that they are dreaming; *signal dreams* – hint to solutions to problems in a person's waking life; *epic dreams* – are vivid and compelling dreams that are hard to forget; and *forgotten dreams* – are forgotten upon waking up but the dreamer is aware that they were dreaming. Currently, dreams are placed into one category.

3 DREAMVIS

In DreamVis emotions are shown as single circular tokens for each time an emotion was logged and coloured as shown in Figure 1. Figure 2 shows the emotions as logged for one day. All twenty-four hours as alternating grey vertical bars are shown here. The coloured emotion tokens are accumulated in the hour in which they were logged. One can see that from 10:00 pm to 5:00 am no emotions were logged during what was presumably sleep time. Note that for the hour between 4:00 pm and 5:00 pm for this day also has no emotions were logged. Using the individual coloured tokens for logged entries provides both the countability of the individual items and the general appearance of a stacked bar graph

[6]. The calendar itself is broken up into three sections: the monthly view, the weekly view and the daily view. For the monthly overview, as seen in Figure 3a, the top three emotions for each particular day are shown. While in Figure 3b the line of coloured circles represents the range of emotions that occur throughout each day.

Figure 1: The logged emotions and their colours

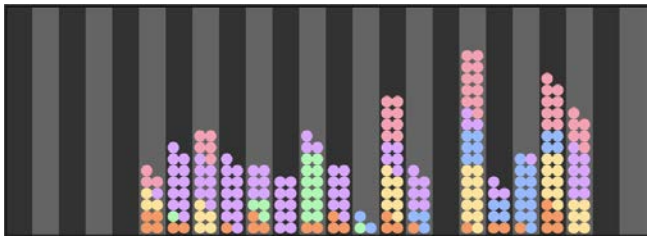

Figure 2: Here the logged coloured emotions tokens are placed in the hour bar chart. The 24 alternating grey bars represent the hours from midnight to midnight. The emotion tokens are placed in the hour in which they were logged.

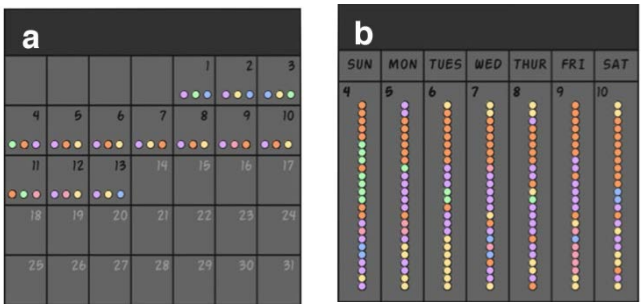

Figure 3: (a) Monthly view of logged emotions; (b) Weekly view of logged emotions.

The individual token bar chart provides the most detailed view. The weekly view (Figure 3b) is also a condensed version. It shows the changing prevalence of tokens as the day progresses. These three views show emotional history at different levels of detail. The dream types are also shown by colour: Red–day dreams; orange–false awakening; yellow–lucid dreams; green–nightmares; blue–signal dreams; purple–epic dreams; and pink–forgotten dreams. Figure 4 shows a dual bar chart. Each bar signifies a dream type according to its colour. The upper half shows the count of that dream type for a week while the bottom half shows the dreams impact rating. This rating is on a scale of one to ten where one has the least emotional impact and ten has the most emotional impact. This shows, not surprisingly, for this week that the nightmares had the most emotional impact and that the epic dreams are a close second. The visualization in Figure 5 supports comparisons over a chosen time granularity. This image shows several weeks, but it can be used to show several months. Each spoke is a dream type. Each coloured polygon represents a week.

Dream data is shown using a dreamcatcher visual metaphor (Figure 5) where the height of the polygon on each spoke indicates the numbers of that type of dream that occurred that week. Adding a second week adds another polygon and provides simple comparison. The height on each axis that tracks the number of dreams per type, where the center of the circle is zero and the largest value is at circumference. Each colored polygon on the visualization represents a week or a month. This shows, for example, how many nightmares or daydreams they had during a certain time period.

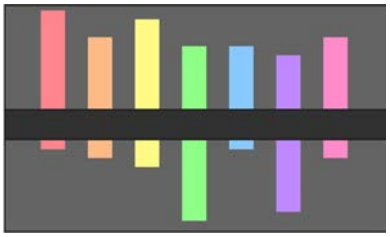

Figure 4: Dual bar chart showing dream impact.

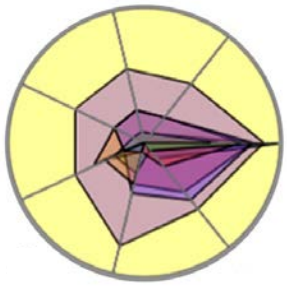

Figure 5: Showing several weeks of dream logs in comparison.

4 Conclusion

We have described DreamVis, a visualization of emotion and dream-based data. Our current representation lets individuals (1) see their dreams over time, and (2) allows for visual comparisons between different dreams. In the future, we would like to include more ways to create associations with the dreams. For instance, being able to see when certain people are in each dream versus day, or also log daily activities to create stronger connections between our everyday lives and what we see in our dreams.

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