

Design Suggestions Using Similarity Information

Stefano Padilla and Mike J. Chantler

Texture Lab, School of Mathematical and Computer Sciences

Heriot Watt University, Edinburgh, EH14 4AS, UK

+44 (0) 131 451 4166

{ S.Padilla, M.J.Chantler } @hw.ac.uk

ABSTRACT

Inspiration influences all creative works. In this paper, we propose a novel method to generate automatic design suggestion with the aim to inspire designers. The retrieval method for the ‘suggestion samples’ will use similarity information. These can be attained from the grouping of samples created by designers whilst working on new or previous designs. Our aim is to improve and speed the design process. In addition, the method allows designers to share inspiring samples without sharing core ideas, as only similarity data is processed. We believe this method can improve designs and impact the creative community.

Categories and Subject Descriptors

D.5.m [Miscellaneous]: Information Interfaces and Presentation (e.g. HCI) Miscellaneous.

General Terms

Algorithms, Management, Measurement, Documentation, Design, Experimentation, Human Factors and Standardization.

Keywords

Design, Suggestions, Designers, Mood Boards, Samples, Inspiration, Community, Tools, Methods, Creativity, Sharing, Collections, Hints, Similarity, SOM, Clusters, Digital.

1. INTRODUCTION

We can think about design as the composition of ideas to convey engaging and dynamic messages whilst satisfying the objectives of the involved individuals. Inspiration for a design can arrive from various sources like from nature to science, images to videos, engineering to art, people to objects, and so on. Also, inspiration can be unpredictable and limitless. As a result, designers have the habit of saving, grabbing and even nicking anything that might inspire them in future designs.

Gathering a collection of inspirational images, drawings, colours and objects becomes a value resource for every designer, and an integral component of the design process. It is common practice for designers to use their prized collections of inspiration to create outputs that facilitate the design. Outputs normally take the form of mood boards (see figure 1 for an example). These boards are created in the early stages of the design process to communicate, explore and bring together ideas of new designs.

At the moment, there are a few research initiatives to innovate and

aid in the creation of mood boards. Current research consists of augmenting and digitalizing the process, such as Lucero’s et al work [1]. However, there is no work aiding the inspiration and sources of it in mood boards. As a result, below we propose a method that would help designers’ inspiration by providing them with ‘suggestion’ samples for their mood boards. Our aim is to aid designers within their normal working habits, and not directly interfering with their process flow. In addition, encouraging designers to share their inspiration with other designers and likewise with the general public.

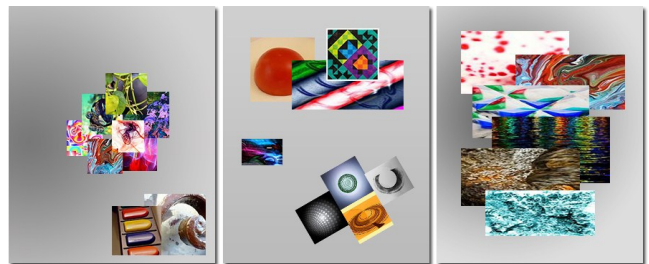


Figure 1. Three examples of random mood boards showing the groupings of samples.

2. STACKS AND PILES OF INSPIRATION

How can we aid in such an elusive process as inspiration? Our answer is to give relevant ‘hints’ or ‘suggestions’ to the designer were needed. Assuming these suggestions will either inspire them, showing samples related to a part of their design, or by funneling their love and hates from a certain part of their designs. The suggestions can’t be picked at random, as they can take any form, therefore invalidating the whole process.

Observing designers at work provided our source of information, which would make the suggestions relevant to the design, and the bare bone of our method. Designers’ collections, their self-organization and mood boards mostly consist of stacks and piles of samples (see figure 2 for an examples). Each batch consists of similar samples that are grouped together for any number of reasons like physical likeness, emotive meaning or matching context to name a few. Using the similar nature of the piles and clustering information allow us to retrieve new inspirational samples. This information is of relevance to a section in the design in any mood board.

3. CREATING RELEVANT SUGGESTIONS

From each pile or stack from a designer’s workspace it is possible to derive a similarity matrix in which the similarity score between any two samples is simply the number of times that the samples

have been placed in the same group or pile. Similarity matrices can be augmented with different groups of similar samples as long as these samples are piled together (see figure 3 for schematic of the method).



Figure 2. Typical example of batches found in a designer's workspace.

The suggestion sample is calculated by annexing all the sample similarities together. The similarity matrix is then converted into Euclidian space distances using multi-dimensional scaling (MDS), and K-means or self-organizing maps [2] [3] are used to limit the suggestions. Finally any sample close in distance to the actual input will be considered a suggestion sample to be used by the designer as source of inspiration.

The suggestion sample is dependent on the designer taste; therefore it is not possible to directly evaluate its quality. The suggestion sample represents a similar sample, which is perceptually relevant to the design's choices based on his/her previous associations, and as such it will depend on the designers previous tastes and current groupings. This retrieval method has been previously demonstrated to work well retrieving perceptually similar samples such as textures [4] and abstract art [5], but can also work for any other type of samples.

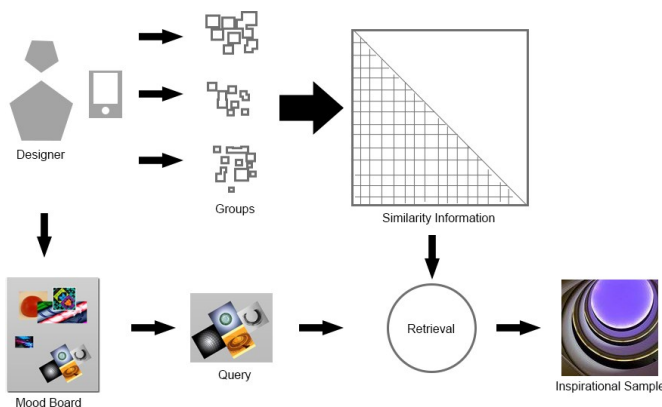


Figure 3. A diagram describing the proposed retrieval of a suggestion sample.

4. SHARING INSPIRATION BETWEEN DESIGNERS

It is well known that designers do not like to share their ideas, as it is difficult to intellectually protect designs. One of our aims is to innovate and disrupt the designers' community by allowing them to share samples without the need to worry about releasing their ideas. It is possible to extend the method to allow similarity information from other users to be augmented, and as a result allowing us to retrieve suggestions from a dataset of various designers without actually sharing the individual ideas.

With the increased use of social collecting and digital curation from sites like Pinterest [6], we believe it would be viable in the future to share inspiration between designers, the general public and likewise.

5. CONCLUSIONS AND FUTURE WORK

It is possible to produce suggestion samples to aid designers' inspiration. Piles and stacks from the designers' workspace are the perfect source of similarity information to produce these suggestion samples.

We envisage this technique being embedded in future tools allowing designers to share their inspirational samples with each other and also the general public contributing towards designs. We believe this method can also be used with various other communities, like engineering, to also aid their designers. More work can also be carried out to simplify the method, retrieve suggestions in real time, improved results by identifying identical samples and weighting important groups.

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