Supporting Users in Exploring Visual Media through Subjective Aesthetic Attributes and Crowd-sourced Tags

M. Sc. in Computer Science
(Networks and Distributed Systems)

The Idea

Data Collection
- Over 12,000 public photographs collected from Flickr along with related EXIF metadata
- Each photograph processed to obtain dominant colors' HSL measures
- A domain model constructed based on the HSL measures and EXIF information

Expert Knowledge
- Semantic attributes defined by the domain expert - subjective expert knowledge, focusing on aesthetic values of a photograph
- Subjective semantic attributes, along with the domain model submitted to SARA*

Tag Space
- Tags given to individual photographs are stored along with their related tag lists obtained from Flickr

Approach

Motivation
- Current approaches do not focus on the impact of the photo
- View-based systems tend to define the "content"
- Typical tagging systems have no idea about the semantics of individual tags, causing irrelevant results.

Research Question
To what extent can the combination of tags and subjective expertise support end users in exploring visual media?

Aims
- Determining authentic semantic information to visual characteristics of an object, e.g. determining the "warmth" of color in a photograph
- Facilitate exploration using aesthetics
- Provide end-users with an alternative access pathway when browsing for photographs.

X²Photo received overall positive feedback
- Majority of the users (8/9) strongly agreed that it was an attractive system
- All the users agreed that the system was a powerful tool for exploring photographs
- When asked if they could see a real-world application stemming from the prototype tool, all users agreed, as long as further improvements were made
- Users accepted the idea of utilizing such a tool in their everyday lives

The user test and the results of its accompanying survey suggest that when describing photographs people tend to communicate "how" a photograph is and then "what" it portrays. This finding indicates a need for a more free vocabulary to be accessed in order to retrieve accurate and relevant photographs from any collection. Traditional tag-based systems reduce photographs to simple words on paper.

As most people have become accustomed to this approach, in such an environment they ignore the initial values with which they would approach a photograph and are therefore relegated to search for the tagged simplification of a photograph rather than the actual photograph itself.

The photographs users found, using the more natural expressions the system offered, indicate that this approach can be used to grant users the freedom they seek in relation to photograph searching. Injecting expert knowledge into a conventional system that only offers tag-based searching, allows users to freely express both the aesthetic of the photograph they want and the picture it conveys.