Fig. 1: HyperVis visualization using Flickr as a content source

HYPERVIS
MEDIA VISUALIZATION ON MOBILE DEVICES

HyperVis is a media browsing tool for mobile devices. It brings to the mobile world a new visualization technique that allows users to navigate through libraries of photos and videos in a quick and intuitive way.

A fish-eye distortion is employed to represent hierarchies of media content, always keeping their context visible. The interaction takes advantage of multitouch displays bringing the fun of manipulating, zooming and selecting at the tip of user's fingers. The visualization is combined with a data explorer engine capable of organizing sets of content from remote storage services such as Flickr (Fig. 1).

Market Relevance

The main target of the project is a group of consumers who actively use mobile devices in their everyday lives for work and entertainment purposes. They have their photos spread over different storage services on the internet and want to see all at once. So, it is important to improve the way users access their content, bringing them meaningful results.

The project is part of a set of projects oriented around mobile platforms and content that try to rethink the current usage for existing services. This tool makes it possible to represent more content, while keeping context, within the same space. It is particularly useful on devices with small displays such as smartphones, cell phones or PDA's.

Visualization

The visualization employs a different kind of geometry to represent tree-like structures on a two-dimensional space — hyperbolic geometry using the Poincaré

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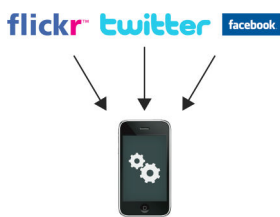info@fraunhofer.pt
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disc model (Fig. 2). In this representation, lines become circles and the space grows exponentially with the distance from the center. These properties cause the fish-eye-like distortion to the tree visualization.
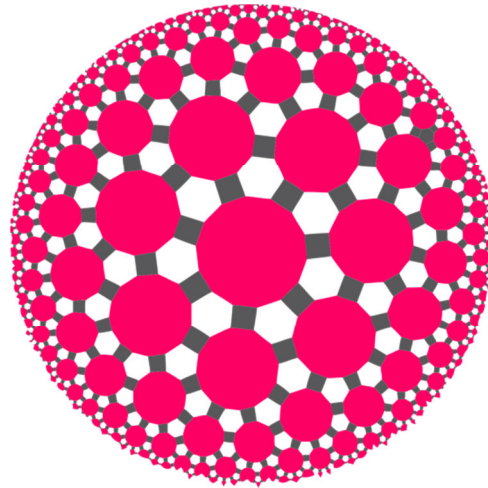

Fig. 2: Hyperbolic tree (Poincaré disc model)

The visualization is composed of three main steps that successively transform raw data from the internet services into a set of visually represented content.

Services. There is a service aggregator that keeps track of all remote services configured. It forwards data requests to each service (e.g. Flickr) and merges the responses. The content manager keeps the data stored in a generic structure, regardless of their source.

Data Views. The data views are the ones that implement the data acquisition and filtering strategy. When selected they are responsible for updating the graphic view, fetching new data available in the content manager and asking the service aggregator for more data.

Visualizations. The visualization is the final step. Besides the hyperbolic tree, a timeline is used in order to display the content on a creation or uploaded date basis.

Project Details

March — July 2009

MSc Thesis Project

More Information

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Requirements

The system is available on the i-Phone/i-Pod touch. It requires a WLAN or 3G connection to retrieve the data from the web. The user needs to be registered on at least one of the supported web services.

Implementation

The tool is implemented using the i-Phone SDK on Objective-C language. The visualization is OpenGL ES 1.1 based. The data is stored on a SQLite database.

Innovations

The project was formulated taking into account mobile devices' specific needs. There are two main innovations brought in by the project.

Life Streaming. Bringing personal media content to a mobile application. It streamlines all the content, despite the source, and depicts hidden connections exploring metadata attributes.

Dynamic Visualization. Implementing and redesigning the hyperbolic tree visualization to meet mobile devices specific characteristics. The tree is built in a dynamic way, changing according to the selected filters or whenever new content is available.

Applications

The tool was designed to be totally independent from any application it might be integrated with. So far, there are two main applications already implemented for this project.

The *KleinerExpresso* application was conceived and developed exclusively as a showcase for the visualization tool. The main purpose is fulfilling the need in the mobile industry for a life streaming application. It works with *Flickr* in order to explore someone's public gallery and his contact's content. It is an early prototype used for testing only.

The TInDI application is the i-Phone counterpart of an existing Android application. It works also with T-Mobile's Mediencenter, a storage service for photos, videos, music and other kind of multimedia files.