



Innovation in Visual Search

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INTRODUCTION

Traditional image search systems rely on the user specifying words to describe the images that they are looking for. These keyword-driven systems mean that the user is required to enter words that are associated with the images to have any possibility of finding the images required. In many instances, the words provided by the users to describe the desired images are not necessarily the same as the words attached to the images in the database. This can result in a frustrating experience for the user, who is left trying to guess which words would provide the best search result.

Traditional image searching is greatly limited by the language of the keywords, i.e. you cannot describe the image in French if the keywords of the images are in English.

Unlike traditional search paradigms, Imprezeeo's visual search solution, Imprezeeo Image Suite[®] allows the user to search for images using images, i.e. using images to find images. In other words, the user does not have to rely on entering keywords to find the images. Imprezeeo's approach allows the user to select one or more image(s) as the reference images to search for images that look like the reference images.

Imprezeeo is a similarity search engine, developed to complement the traditional keyword-driven image search systems. Imprezeeo provides users of image search systems the ability to search for similar images by using reference images, rather than relying on metadata describing the images. In other words, users have to simply choose one or more reference images that best represent what they are looking for and call Imprezeeo to find images that are similar to the reference images. This makes image searching more intuitive and provides a richer and satisfying user experience.

Visual search is a paradigm that enriches the user experience in image search systems. It provides the user with the ability to visually specify the type of image he/she wants. It is not driven by metadata, but relies on one or more reference images selected by the user.

WHY IMPREZZEO?

There are a number of vendors offering visual search solutions. So, what makes Imprezzeo different and, more importantly, how can Imprezzeo improve business effectiveness and increase revenue?

Imprezzeo was designed not just to be another 'player' in the visual search market. Instead, the Imprezzeo development team has heavily used their combined 60+ years of experience in system and product development to build a powerful enterprise level visual search engine with incorporating high reliability and scalable performance.

It provides:

- Easy integration and deployment;
- Scalable deployment models to support small collections of images up to very large collections;
- Rich set of features that enhances the user experience;
- Unique combination of disparate technologies;
- Robust engine that performs reliably and quickly;
- Ability to configure and tune the Engine to suit the client's requirements.

According to Wikipedia:

"Content Based Image Retrieval (CBIR), also known as query by image content (QBIC) and content-based visual information retrieval (CBVIR) is the application of computer vision to the image retrieval problem, that is, the problem of searching for digital images in large databases."

Imprezzeo's solution implements CBIR as one of its underlying technologies. This means that in our search for matching images, we analyse the actual contents of the reference images, including the colour definitions, spatial layout, shapes, texture and facial information. Once the images are analysed, the contents will be used to search for matching images.

Imprezzeo's solution allows you to find images by images, rather than text. We use the attributes of the image to search for matching images rather than rely on manual indexing or text descriptions.

OUR DIFFERENTIATORS

- **Imprezzeo complements your existing search system**

Imprezzeo is developed to complement traditional text-based image search systems. Imprezzeo does not replace an existing search system; it sits side by side to enhance the system and provides the user with a richer and more satisfying user experience.

This means that visual similarity search can be easily and quickly deployed without the costs of a major revamp of your existing search system.

- **Imprezzeo is easy to integrate**

Imprezzeo provides a collection of SOAP/XML Web Services to integrate seamlessly into any existing search system. These Web Services can be called with and from any programming language.

This versatility enables the Imprezzeo Engine to be deployed seamlessly (minimal changes to the existing User Interface) and quickly (minimal programming effort).

The same collection of Web Services is also used to integrate Imprezzeo into your Image Processing Workflow System. This means that as you add or delete images from your collection, these changes are instantly available for similarity searching.

- **Imprezzeo's technology is designed for versatility, scalability and efficacy**

The Imprezzeo Web Services allow the client to integrate Imprezzeo in any manner that best suits their requirements. For example, Imprezzeo is used for the similarity search and the result set is then passed through additional filters (e.g. metadata linguistic matching, semantics, text mining, etc).

Imprezzeo's technology is designed to be scalable, i.e. its product architecture can handle small collections of 10,000s images to very large collections of 20 million++ images. Various deployment models are provided to support the corresponding size of the collection of images.

Imprezzeo's technology is efficient and effective. Imprezzeo returns the results in sub-seconds and can also search through an entire collection very effectively and efficiently.

- **Imprezzeo allows the user to select more than one reference image**

Selecting more than one similar reference image gives a better definition of what the user is after. This means the user can intuitively tell Imprezzeo:

"I want images that look like this one and that one, as well as the one in the bottom right."

This unique capability in Imprezzeo provides for a more rewarding user experience; returning a more accurate result set that meets the user's expectations; reducing the walk-aways from your business.

- **Imprezzeo provides for uploading of a sample image to search**

The Imprezzeo technology allows the user to use their own reference image as the basis for a search. This reference image can be uploaded to the system to search for similar images across the entire collection.

The versatility of Imprezzeo allows the client to implement 'user guidance' capability (e.g. user input keywords) to provide additional filters for a more accurate result set.

This capability represents a revenue opportunity for Imprezzeo's clients' businesses.

- **Imprezzeo allows for exclusions**

Imprezzeo not only allows the user to specify one or more reference images that it uses to perform its similarity search. It also provides the user the ability to specify one or more images to use to exclude images from the result set.

In other words, Imprezzeo allows the user to specify search criteria such as:

"I want images that look like images A and B, but don't want any that look like images C and D."

- **Imprezzeo allows the user to search for similar images within a result set framed by an initial keyword search or expand the search across the entire collection**

The user can be provided with the option to search for similar images bounded by the keyword search, i.e. search within the result set returned by an initial keyword search, or to search through the entire collection.

Imprezzeo's solution is versatile and is flexible to accommodate the user's search instincts and initiatives.

- **Imprezzeo combines Content Based Image Retrieval (CBIR) and Face Recognition technologies**

Imprezzeo is unique in that it combines two distinct technologies to provide for visual similarity searches for images with people and personalities.

These disparate technologies are used intelligently in Imprezzeo to provide an effective and powerful image search solution to find images that most closely match the reference image.

- **Imprezzeo has face detection and face recognition technologies**

Imprezzeo's facial technologies can be deployed in 2 modes – detecting faces (Face Detection) in images as well as recognising personalities (Face Recognition) in images.

Imprezzeo's Face Detection technology is innovative and it supports searches based on similar number of faces as well as the dominance of the faces in the images.

The facial technology can be extended to enable Face Recognition. When enabled, this technology will recognise, with high accuracy, faces of personalities (who have been trained) in the images.

The facial technology means that the user can search for generic images with people in them, or for images with specific personalities. This is a powerful approach to help the user find the required images quickly.

- **Imprezzeo developed and patented algorithms for similarity search**

Most similarity search solutions use similar underlying technology, based on the MPEG-7 libraries or other similar standards. The majority of the features or attributes used in the similarity search are colour based.

Imprezzeo has developed additional features, including edging and texture information, as well as facial information. The additional features allow for better granularity in the similarity search.

Imprezzeo has filed patent applications for these extensions.

- **The Imprezzeo engine can be tuned to suit various collections**

In most instances, the default settings for the Imprezzeo engine should suffice. However, the Imprezzeo engine can be tuned and tailored to adapt to the wide variety of content in client image collections. The Engine can be configured to provide different weighting bias for any of the features used in the similarity search algorithm.

This configuration and tuning capability in Imprezzeo means that the Engine was not designed with a “One Size Fits All” approach. Rather, Imprezzeo recognises that the clients understand their collection best and Imprezzeo thus provides the capabilities for the Engine to be tuned and configured accordingly.

Imprezzeo Image Suite comes with two pre-configured groups of settings; one for creative or artistic collections of images and the other oriented toward news and media type collections. The latter collections typically have much less well defined images with cluttered backgrounds, and this configuration is tuned to best handle these image types.

ABOUT

Imprezzeo is a visual search technology company. Imprezzeo Image Suite provides an enterprise level solution that complements existing search systems, making it easier and faster for users to find the images they need. Our patented technology provides developer tools to enable rapid integration of visual similarity search and facial recognition functionality into existing search and content management systems.

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