

## **Abstract**

While Flickr, a widely-known photo sharing system, allows users to describe their own photos with tags (aka. folksonomy tags) for indexing purposes, its tag-based photo retrieval function is severely hampered by the inherent nature of folksonomy tags. This paper presents SemFlickr, an application which enhances the search in Flickr with its semantic query suggestion feature. SemFlickr employs SQORE, an ontology retrieval system, to retrieve relevant ontologies from the Semantic Web and then derives query term suggestions from those ontologies. To ensure that the highly related photos will appear at the top of the results, SemFlickr takes the ontological relations among the given query terms to assign tag scores and then generates its ranked results. Experimental outcomes are encouraging and reveal a number of useful insights for developing applications that integrate the Semantic Web and Web 2.0 together.

**Keywords:** Semantic media adaptation, Semantic Web, Web 2.0, folksonomy, photo retrieval

## **1 Introduction**

*Flickr* – <http://www.flickr.com> (Yahoo! Inc., 2009) is one of the very first successful and widely-used Web 2.0 applications. It allows users to freely upload, tag and share photos and videos with others. With its self-tagging mechanism, different users can annotate the same resource with different tags depending on the social communities they belong to, their background, their perception and areas of expertise, etc. To date, there are approximately at least 3 million items uploaded per day with 20 million unique users visiting Flickr per month. In spite of its rapid growth and (meta)data richness, its users are experiencing increasing difficulties of searching for a particular photo or video.

Consider, for example, that Flickr currently has more than 2 million photos tagged with the term *baby* whereas its full-text search engine returns approximately 6 million photos relevant to the term *baby*. Simply searching Flickr with the query term *baby* will not return only the photos of very young children, but also those about baby-related products, toys, young animals, pregnant women and even adults. Unlike a concept defined in an ontology, the semantics of a particular tag is ambiguous, and may carry more than one specific meaning depending on each user's viewpoint and context. This can answer why Flickr's most interesting photos of *baby* contain a lot of animal photos (See Figure 1). Therefore, users must put an extra effort to think of additional precise query terms to clarify a search and obtain the desired results. Assisting the searching process by providing users with query suggestions can help reduce the searching effort and improve the search's precision.