

MULTI-INDEX, MULTI-OBJECT CONTENT-BASED RETRIEVAL
WITH SPATIAL SUMMARIZATION

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ABSTRACT

In recent years we have seen the development of several novel content-based retrieval (CBR) systems that have had success by focusing on a specific domain and exploiting domain-specific information. CBR systems allow users to query a media database using item content as opposed submitting a text-based query. In many CBR applications, the input to the search process is a complicated object that may be composed of several constituent parts. The proposed approach performs CBR queries by decomposing a complex query into several heterogeneous queries. We have developed a multi-index, multi-object CBR framework for geospatial imagery retrieval that extracts features specifically developed for high-resolution commercial satellite imagery. The results of these queries will be spatially summarized for a user based on both retrieval score and spatial distance. This allows results to be presented in a logical manner to allow for more efficient interpretation by the user. Further, we propose to develop an additional search capability that allows for multi-object searches by spatial configuration rather than simply by object-to-object correspondence. Additionally, to confront situations where a user has determined that certain search results are not relevant, we will provide online and memory-based relevance feedback algorithms for use with multi-index, multi-object CBR systems. The experimental results demonstrate the efficiency and accuracy of the proposed methods; moreover, through the fusion of multi-index and multi-object search techniques, we are able to construct new, sophisticated query mechanisms.