

2011

# Dynamic Two-Stage Image Retrieval from Large Multimodal Databases

Arampatzis, Avi

Springer-Verlag

---

<http://hdl.handle.net/11728/10163>

*Downloaded from HEPHAESTUS Repository, Neapolis University institutional repository*

# Dynamic Two-Stage Image Retrieval from Large Multimodal Databases

Avi Arampatzis, Konstantinos Zagoris, and Savvas A. Chatzichristofis

Department of Electrical and Computer Engineering,  
Democritus University of Thrace, Xanthi 67100, Greece  
{avi,kzagoris,schatzic}@ee.duth.gr

**Abstract.** Content-based image retrieval (CBIR) with global features is notoriously noisy, especially for image queries with low percentages of relevant images in a collection. Moreover, CBIR typically ranks the whole collection, which is inefficient for large databases. We experiment with a method for image retrieval from multimodal databases, which improves both the effectiveness and efficiency of traditional CBIR by exploring secondary modalities. We perform retrieval in a two-stage fashion: first rank by a secondary modality, and then perform CBIR only on the top- $K$  items. Thus, effectiveness is improved by performing CBIR on a ‘better’ subset. Using a relatively ‘cheap’ first stage, efficiency is also improved via the fewer CBIR operations performed. Our main novelty is that  $K$  is dynamic, i.e. estimated per query to optimize a predefined effectiveness measure. We show that such dynamic two-stage setups can be significantly more effective and robust than similar setups with static thresholds previously proposed.