

## Multi-Hashing for Large Scale Image Retrieval



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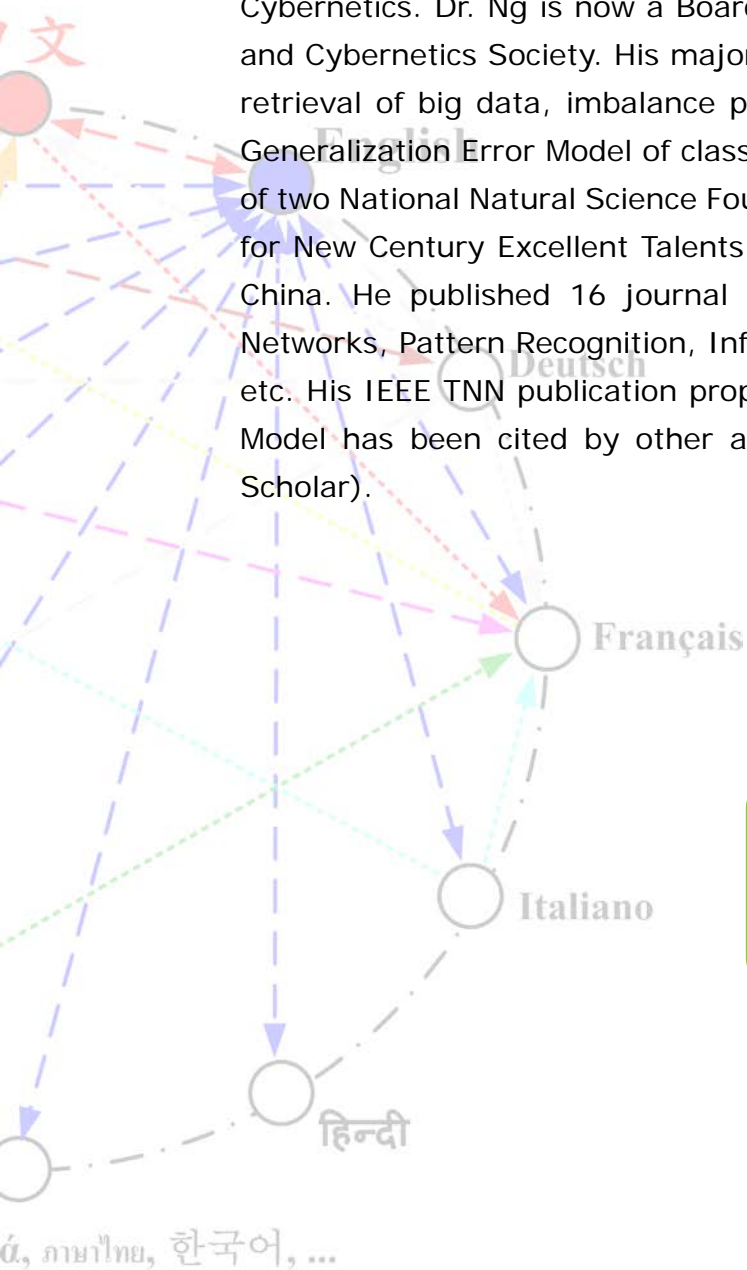
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### Abstract

Hashing is an effective method to retrieve similar images from a large scale database. However, a single hash table requires searching an exponentially increasing number of hash buckets with large hamming distance for a better recall which is time consuming. The union of results from multiple hash tables (multi-hashing) yields a high recall but low precision with exact hash code matching. Methods using image filtering to reduce dissimilar images rely on hamming distance or hash code difference between query and candidate images. However, they treat all hash buckets to be equally important which is not true in many cases. Moreover, a large hash bucket may return many more dissimilar images, especially for those images located close to the bucket boundary. Unfortunately, it is difficult to calculate the exact bucket size owing to its high-dimensional irregular shape. We propose two descriptors to score the hash bucket size and image location using a location based sensitivity measure. A neural network is trained to filter dissimilar images based on these two descriptors, hamming distance and code difference. Both the neural network and the two new descriptors could be computed offline when hash tables are available. Hence the proposed Sensitivity based Image Filtering method (SIF) is efficient during retrieval. Experimental results using four large scale databases show that the proposed method improves precision and recall for both data-dependent and data-independent multi-hashing methods as well as multi-hashing combining both types.

## Biography

Dr. Wing Ng is currently an associate professor with the School of Computer Science and Engineering, South China University of Technology. He serves as an associate editor of the International Journal on Machine Learning and Cybernetics. Dr. Ng is now a Board of Governor of the IEEE Systems, Man and Cybernetics Society. His major research interests include indexing and retrieval of big data, imbalance problems, neural networks and Localized Generalization Error Model of classifiers. Dr. Ng is the principal investigator of two National Natural Science Foundation Projects of China and a Program for New Century Excellent Talents in University of Ministry of Education of China. He published 16 journal papers in IEEE Transactions on Neural Networks, Pattern Recognition, Information Science and Machine Learning, etc. His IEEE TNN publication proposing the Localized Generalization Error Model has been cited by other articles for more than 85 times (Google Scholar).



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