# PERCEPTUAL METRICS FOR IMAGE DATABASE NAVIGATION



Yossi Rubner Carlo Tomasi

# **Perceptual Metrics For Image Database Navigation**

Chid Apte, Bing Liu, Srinivasan Parthasarathy

### **Perceptual Metrics For Image Database Navigation:**

Perceptual Metrics for Image Database Navigation Yossi Rubner, Carlo Tomasi, 2013-03-14 The increasing amount of information available in today s world raises the need to retrieve relevant data efficiently Unlike text based retrieval where keywords are successfully used to index into documents content based image retrieval poses up front the fundamental questions how to extract useful image features and how to use them for intuitive retrieval We present a novel approach to the problem of navigating through a collection of images for the purpose of image retrieval which leads to a new paradigm for image database search We summarize the appearance of images by distributions of color or texture features and we define a metric between any two such distributions This metric which we call the Earth Mover's Distance EMD represents the least amount of work that is needed to rearrange the mass is one distribution in order to obtain the other We show that the EMD matches perceptual dissimilarity better than other dissimilarity measures and argue that it has many desirable properties for image retrieval Using this metric we employ Multi Dimensional Scaling techniques to embed a group of images as points in a two or three dimensional Euclidean space so that their distances reflect image dissimilarities as well as possible Such geometric embeddings exhibit the structure in the image set at hand allowing the user to understand better the result of a database guery and to refine the guery in a perceptually intuitive way Exploratory Analysis of Multivariate Image Data Fundamentals of Image Data Mining Dengsheng Zhang, 2021-06-25 This unique and useful Axel Saalbach, 2006-09-11 textbook presents a comprehensive review of the essentials of image data mining and the latest cutting edge techniques used in the field The coverage spans all aspects of image analysis and understanding offering deep insights into areas of feature extraction machine learning and image retrieval The theoretical coverage is supported by practical mathematical models and algorithms utilizing data from real world examples and experiments Topics and features Describes essential tools for image mining covering Fourier transforms Gabor filters and contemporary wavelet transforms Develops many new exercises most with MATLAB code and instructions Includes review summaries at the end of each chapter Analyses state of the art models algorithms and procedures for image mining Integrates new sections on pre processing discrete cosine transform and statistical inference and testing Demonstrates how features like color texture and shape can be mined or extracted for image representation Applies powerful classification approaches Bayesian classification support vector machines neural networks and decision trees Implements imaging techniques for indexing ranking and presentation as well as database visualization This easy to follow award winning book illuminates how concepts from fundamental and advanced mathematics can be applied to solve a broad range of image data mining problems encountered by students and researchers of computer science Students of mathematics and other scientific disciplines will also benefit from the applications and solutions described in the text together with the hands on exercises that enable the reader to gain first hand experience of computing

Lebensstilsegmentierung aufgrund einer inhaltsbasierten Auswertung digitaler Bilder Ines Daniel, 2013-11-01 Die

Marktsegmentierung ist eines der meist diskutierten Themen im Marketing Eine kaum genutzte Datengrundlage stellt dabei die inhaltsbasierte Auswertung digitaler Bilder dar Digitale Bilder nehmen in der heutigen Gesellschaft einen immer gr eren Stellenwert ein und werden zunehmend ffentlich verbreitet Fr die Marktforschung entstehen somit zahlreiche neue Daten welche neue Erkenntnisse liefern k nnen Vor diesem Hintergrund verfolgt Ines Daniel die Frage ob Fotografien die Aktivit ten Meinungen und Interessen ihrer Besitzer reflektieren Zudem pr ft sie ob und wie probandenseitig bereit gestellte Fotografien die Datenerhebung und auswertung erweitern k nnen Das entwickelte Konzept zur Fotografie gest tzten Lebensstilsegmentierung wurde mittels zweier empirischer Untersuchungen validiert **Multimedia Databases and Image Communication** Maurizio Tucci,2003-06-30 Multimedia technologies are rapidly attracting more and more interest every day The Internet as seen from the end user is one of the reasons for this phenomenon but not the only one Video on Demand is one of the buzzwords today but its real availability to the general public is yet to come Content providers such as publishers broadcasting companies and audio video production rms must be able to archive and index their productions for later retrieval This is a formidable task even more so when the material to be sorted encompasses many di erent types of several media and covers a time span of several years In order for such a vast amount of data to be easily available existing database design models and indexing methodologies have to be improved and re ned In addition new techniques especially tailored to the various types of multimedia must be devised and evaluated For archiving and trasmission data compression is another issue that needs to be addressed In many cases it has been found that compression and indexing can be successfully integrated since compressing the data by Itering out irrelevancy implies some degree of und standing of the content Image and Video Retrieval Hari Sundaram, 2006-06-29 Here are the refereed proceedings of the 5th structure International Conference on Image and Video Retrieval CIVR 2006 held in Singapore in July 2006 Presents 18 revised full papers and 30 poster papers together with extended abstracts of 5 papers of 1 special session and those of 10 demonstration papers These cover interactive image and video retrieval semantic image retrieval visual feature analysis learning and classification image and video retrieval metrics and machine tagging **Datamining: Methoden integrativer Datenpräsentation** Jörg Andreas Walter, 2004-12-19 Mathematics of Data/image Coding, Compression, and Proceedings of the ...ACM Symposium on Theory of Computing ,2002 Encryption ,2005 Storage and Retrieval *Proceedings of the 34th Annual ACM Symposium on the Theory of Computing John H.* for Media Databases ,2001 Reif,2002 Finding Color and Shape Patterns in Images Scott Cohen, 1999 Abstract This thesis is devoted to the Earth Mover's Distance EMD an edit distance between distributions and its use within content based image retrieval CBIR The major CBIR problem discussed is the pattern problem Given an image and a query pattern determine if the image contains a region which is visually similar to the pattern if so find at least one such image region An important problem that arises in applying the EMD to CBIR is the EMD under transformation EMDG problem find a transformation of one distribution which

minimizes its EMD to another where the set of allowable transformations G is given The problem of estimating the size scale at which a pattern occurs in an image is phrased and efficiently solved as an EMDG problem For a large class of transformation sets we also present a monotonically convergent iteration to find at least a locally optimal transformation Our pattern problem solution is the SEDL Scale Estimation for Directed Location image retrieval system Three important contributions of SEDL are 1 a general framework for finding both color and shape patterns 2 the previously mentioned scale estimation algorithm using the EMD and 3 a directed as opposed to exhaustive search strategy \*\*Internet Imaging\*, 2003\*\*

**Proceedings of the Seventh SIAM** *Neural Spike Feature Extraction and Data Classification Zhi* Yang, 2010 International Conference on Data Mining Chid Apte, Bing Liu, Srinivasan Parthasarathy, 2007 The Seventh SIAM International Conference on Data Mining SDM 2007 continues a series of conferences whose focus is the theory and application of data mining to complex datasets in science engineering biomedicine and the social sciences These datasets challenge our abilities to analyze them because they are large and often noisy Sophisticated highperformance and principled analysis techniques and algorithms based on sound statistical foundations are required Visualization is often critically important tuning for performance is a significant challenge and the appropriate levels of abstraction to allow end users to exploit sophisticated techniques and understand clearly both the constraints and interpretation of results are still something of an open question Color Correlogram Representation and Differential Earth Mover's Distance Matching Qi IV 2000 Ebad Banissi, 2000 From the July 2000 conference on information visualization a term coined in 1989 Zhao,2009 to signify the ability of humans to process complex patterns through visualization comes 91 articles dedicated to interdisciplinary visualization techniques and applications related to computer based information Amon Early Vision Using Distributions Mark A. Ruzon, 2000 Proceedings, ACM Multimedia ..., 2000 Advances in Multimedia Information Processing-PCM ..., 2002

The Enigmatic Realm of **Perceptual Metrics For Image Database Navigation**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing in short supply of extraordinary. Within the captivating pages of **Perceptual Metrics For Image Database Navigation** a literary masterpiece penned with a renowned author, readers set about a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book is core themes, assess its distinct writing style, and delve into its lasting effect on the hearts and minds of those who partake in its reading experience.

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