FELIX STÜRMER

SKETCH-BASED IMAGE RETRIEVAL USING CURVELETS

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An Evaluation of Curvlet-Based Cross-Domain Descriptors for Sketch-Based Image Retrieval

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ABSTRACT

Short summary of the contents...

ACKNOWLEDGMENTS

acknowledgments go here...

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LISTINGS

ACRONYMS

1 INTRODUCTION

1.1 MOTIVATION

Paragraph about increase in visual data, mobile cameras, etc

At the core of the research into content-based image retrieval lies the need to be able to access the growing repositories of visual data in a convenient and efficient manner. In this context "convenient" describes the ability for the user to express the query without a complex reformulation of the intent to make it accessible to the query processor. At the same time the computational efficiency becomes more important as the amount of data to search grows. This issue becomes even more critical as the use of mobile, power-limited devices increases across many areas of application, such as autonomous vehicles or handheld augmented reality devices.

- Definition CBIR
- historical intro [CBIR at the end of the early years]
- Why CBIR: Insufficient Mapping Image <=> Language
  - Search by Example
  - Association Search (Discovery)
- Visual Similarity => Semantic Similarity? Sematic Gap! [Smeulders2000]

1.2 OUTLINE

Thesis outline goes here

2

BACKGROUND & RELATED WORK

Complete vs incomplete sketches

Most approaches can be characterized by looking at three stages in their processing pipeline:

INPUT FORMAT The structure of the input data determines the amount of information available to the subsequent processing steps. Possible preprocessing steps include color space conversion, scaling and edge extraction.

EXTRACTED FEATURES The large number of coefficients produced by the curvelet transform are reduced to a set of feature coefficients.

DISTANCE METRIC In order to rank the images according to similarity a metric is used to calculate the distance in feature space between two sets of feature coefficients. The selection of a metric is often closely coupled with the feature extraction algorithm.

2.1 INPUT FORMAT

2.2 FEATURES

- bag of features from k-means clustered visual words [video google]
- great comparison of sampling for k-means clustered vws [nowak06]

2.3 METRIC

- after ranking using euclidean distance, rank by spatial similarity [video google]
- Earth Mover's distance? [rubnerljcv00]

3 PROPOSED SOLUTION

Proposed solution goes here...

3.1 INPUT FORMAT

- Luma component (Y') of Y'UV representation
- Gradient magnitude of Sobel operator of luma component
- Canny edge map of luma component
- gPb

3.2 FEATURE EXTRACTION

- Global features: mean and standard deviation
- Local features: visual words via k-means clustering

3.3 DISTANCE METRIC

- Euclidean Distance

Read Image	Apply Curvelet Transform	Calculate Means / Standard Deviations	Rank by Euclidean Distance

4

EXPERIMENTAL RESULTS

Experimental results go here...

5 ANALYSIS

Analysis goes here...

6 CONCLUSION

Conclusion goes here...

COLOPHON

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DECLARATION

Put your declaration here.

Berlin, January 2012

Felix Stürmer