

open-mosaic

OpenCV based mosaic generator
implemented in python

Information Retrieval - SS 2015

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Motivation

- ▶ Implement a mosaic stitcher
- ▶ Try various feature extractions
- ▶ Allow for quick exchange of feature vectors
- ▶ Use OpenCV for Speed-Up

Mosaic

- ▶ Picture of pictures
- ▶ Replace areas from original picture with individual pictures
- ▶ Choose from a set of given images based on their colors



Approach

2 stages

- ▶ I: Indexing, extract features from image data set.
- ▶ II: Stitching, find best match and replace it.

Index

- ▶ Extract Average H,S,V,R,G,B values for each image
- ▶ Scale down to 100x100 pixels
- ▶ Use open-cv histogram functions to extract average colors
- ▶ `{ "r": 118, "b": 229, "g": 220, "h": 34, "s": 73, "v": 34, "file": "img_234234.jpg" }`

Approach

Feature vector

- ▶ Average color, based on weighted channel histogram
- ▶ Normalized to number of pixels

Distance vector

- ▶ Euclidian distance
- ▶ $\sqrt{\sum_{i=1}^n (q_i - p_i)^2}$

Evaluation

Indexing:

- ▶ INRIA Holidays dataset¹
- ▶ 2.7 GB of JPEG images
- ▶ indexed < 40sec

Stitching

- ▶ 50 tiles / second
- ▶ Rather slow, due to python environment
- ▶ Parallelization is possible (split rows)
- ▶ Evaluated RGB vs. HSV

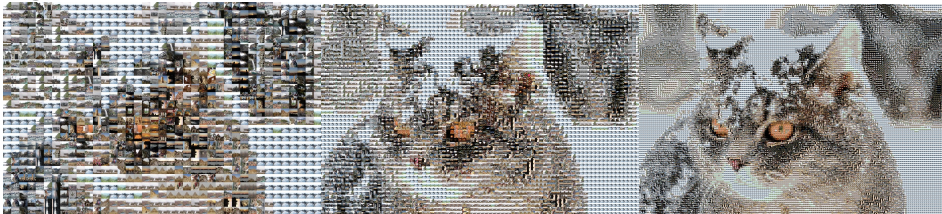
¹<http://lear.inrialpes.fr/~jegou/data.php>

Results

Input

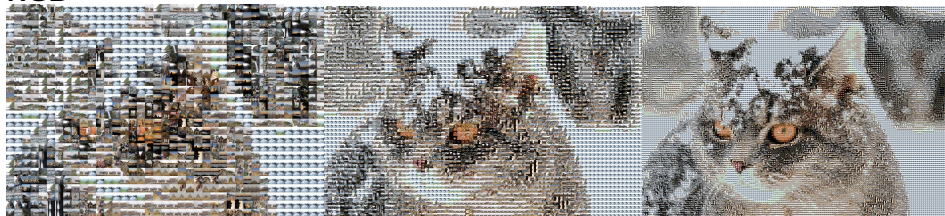


RGB



Results

RGB



HSV



Results

Input



RGB



Results

RGB



HSV



Thank you!

