

Comparison of different Features Detectors and Descriptors in the Cut-Copy Forgery scenario

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CSI 445 - Digital Image Forensics

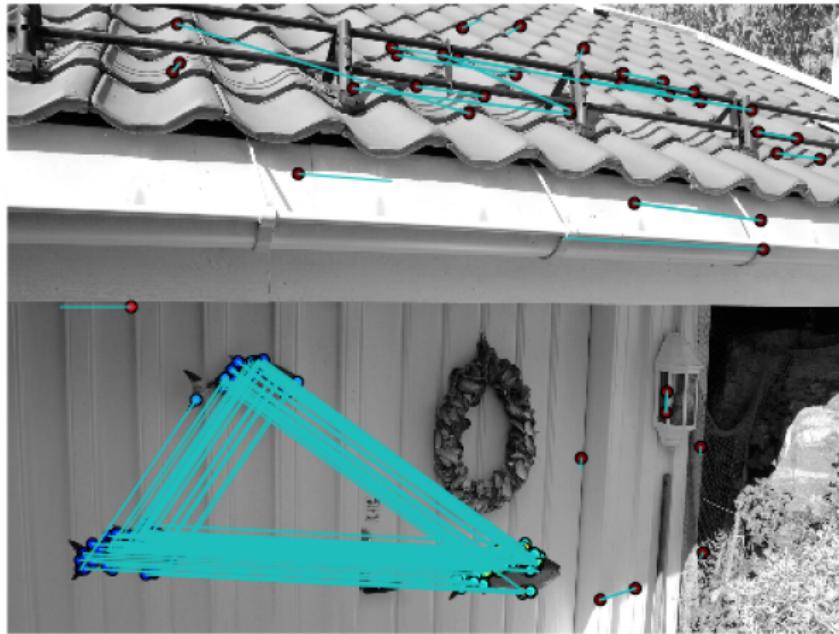
Introduction

- Copy-move attacks



Motivation

- All those feature methods, what is the best?
 - What is the best KeyPoint detector?
 - What is the best KeyPoint descriptor?



Methods

- Source

Methods

- Source
 - Python

Methods

- Source
 - Python
 - Numpy

Methods

- Source
 - Python
 - Numpy
 - Matlab

Methods

- Source
 - Python
 - Numpy
 - Matlab
 - Opencv

Methods

- Source
 - Python
 - Numpy
 - Matlab
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- Feature Detector

Methods

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 - SIFT, SURF, STAR, ORB

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 - SIFT, SURF, STAR, ORB
 - BRIEF, BRISK, FREAK

Methods

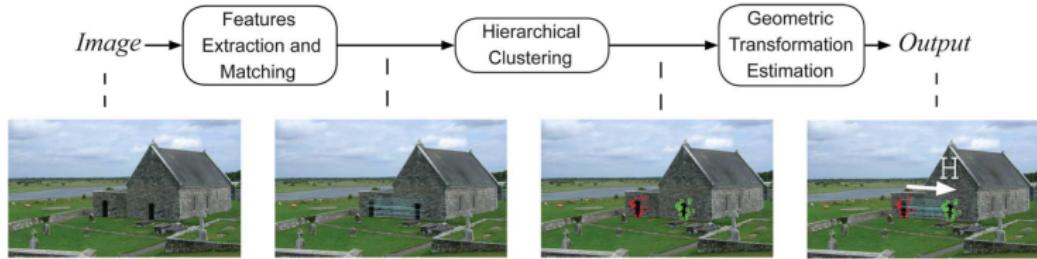
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 - Python
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 - BRIEF, BRISK, FREAK
- Database

Methods

- Source
 - Python
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 - MICC-F220

Process

- Using a combination of each keypoint detector and descriptor



Crawl tweets from Twitter

- Streaming API
 - New York city region
 - Keywords related to crime

Classification of tweets

- Training Data

- 14094 tweets manually labeled (5837 positives, 8257 negatives)
- Types of Crimes:
 - Robbery, Shooting, Theft, Assault
 - Burglary, Vandalism, Arson, Drug Possession

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- Classifier of crime related Statistics
 - Precision: 0.98 (+/- 0.01)
 - Recall: 0.98 (+/- 0.01)
 - F1 Score: 0.98 (+/- 0.00)

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 - F1 Score: 0.98 (+/- 0.00)
- Classifier of type of crimes Statistics
 - Precision: 0.92 (+/- 0.01)
 - Recall: 0.93 (+/- 0.01)
 - F1 Score: 0.93 (+/- 0.01)

Extract Location of Tweet's text

- Preprocessing

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- Preprocessing
 - Lowercase

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 - Lowercase
 - Remove punctuation

Extract Location of Tweet's text

- Preprocessing
 - Lowercase
 - Remove punctuation
 - Apply alias dictionary

Extract Location of Tweet's text

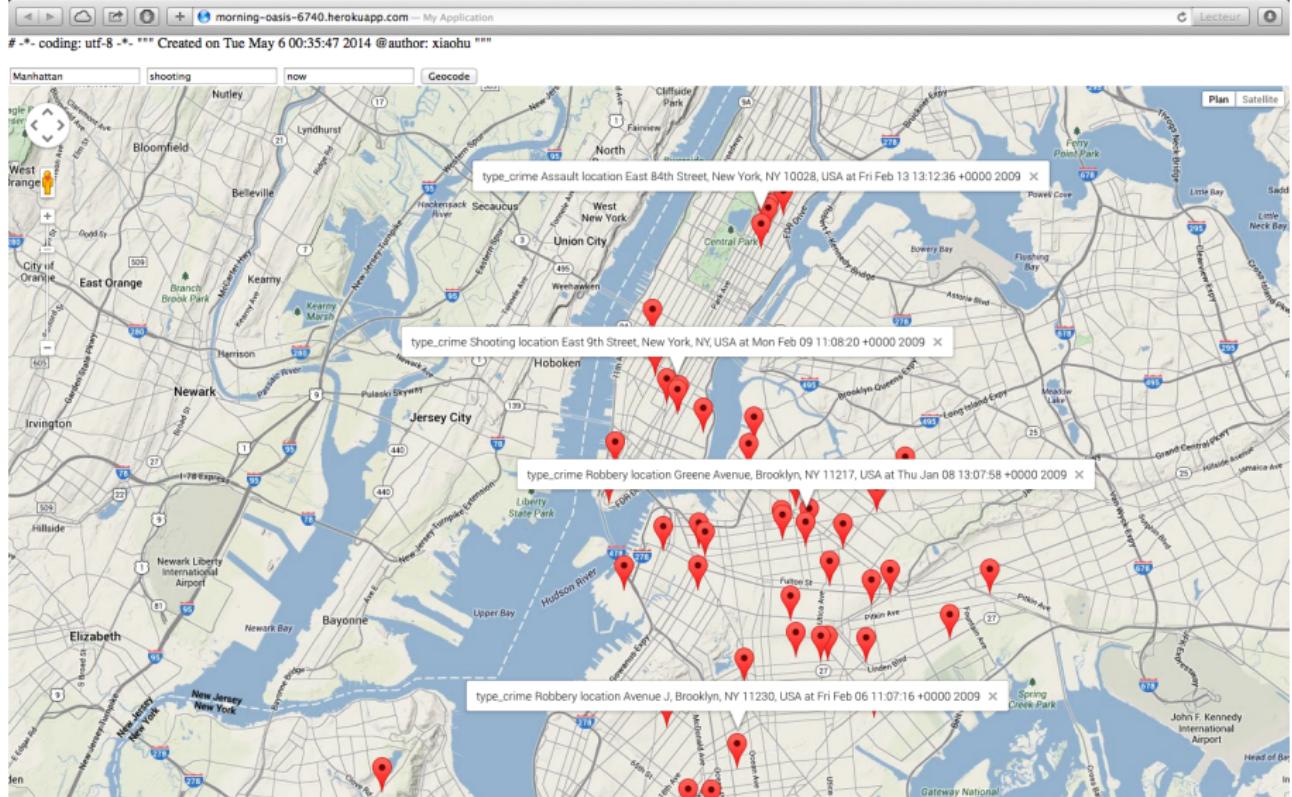
- Preprocessing
 - Lowercase
 - Remove punctuation
 - Apply alias dictionary
- Match street addresses (Begin of address)

Extract Location of Tweet's text

- Preprocessing
 - Lowercase
 - Remove punctuation
 - Apply alias dictionary
- Match street addresses (Begin of address)
- Match state names (End of address)

Web App Interface

<http://morning-oasis-6740.herokuapp.com>



Questions ?

