

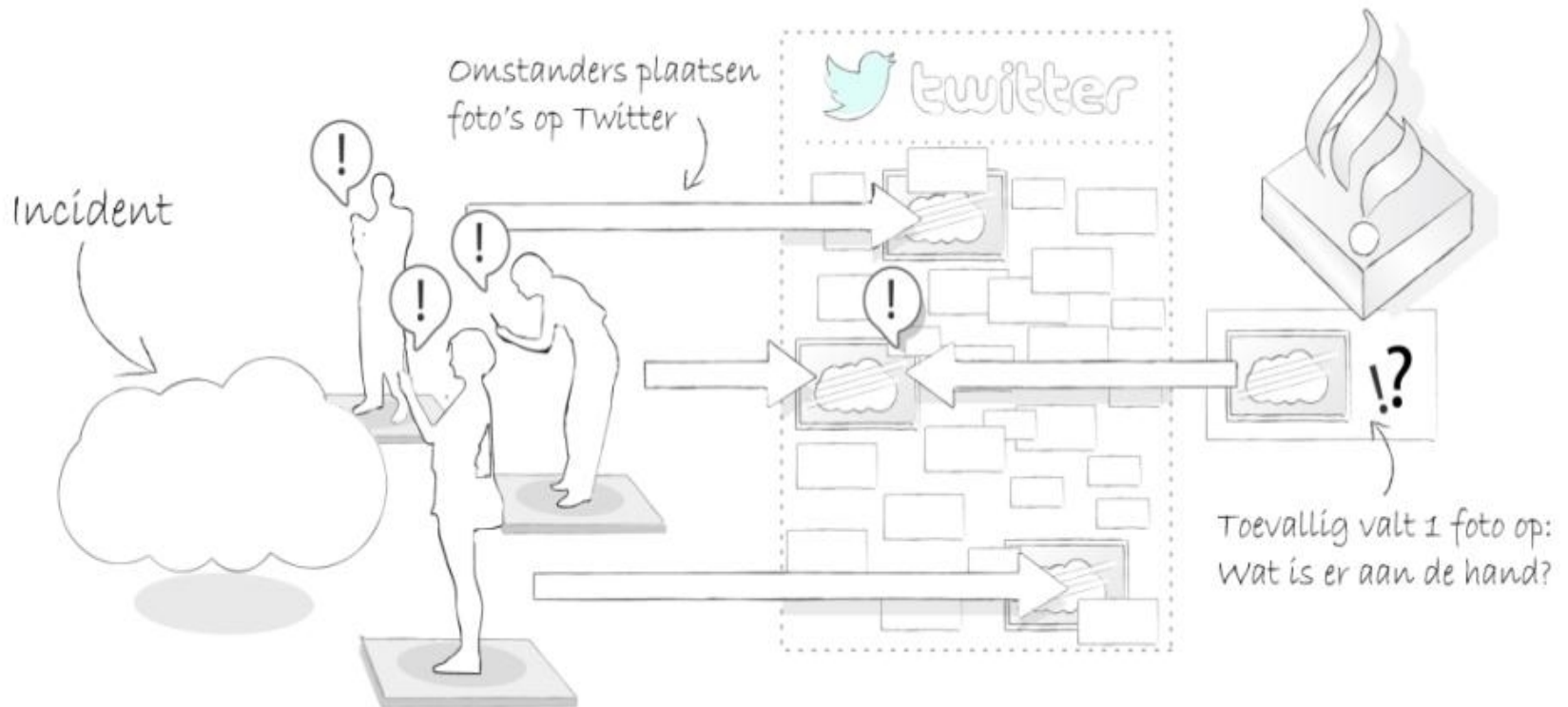
# Image-based localization of pictures using Google Streetview images

## CONTENT

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Why?  
Method  
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Demo!

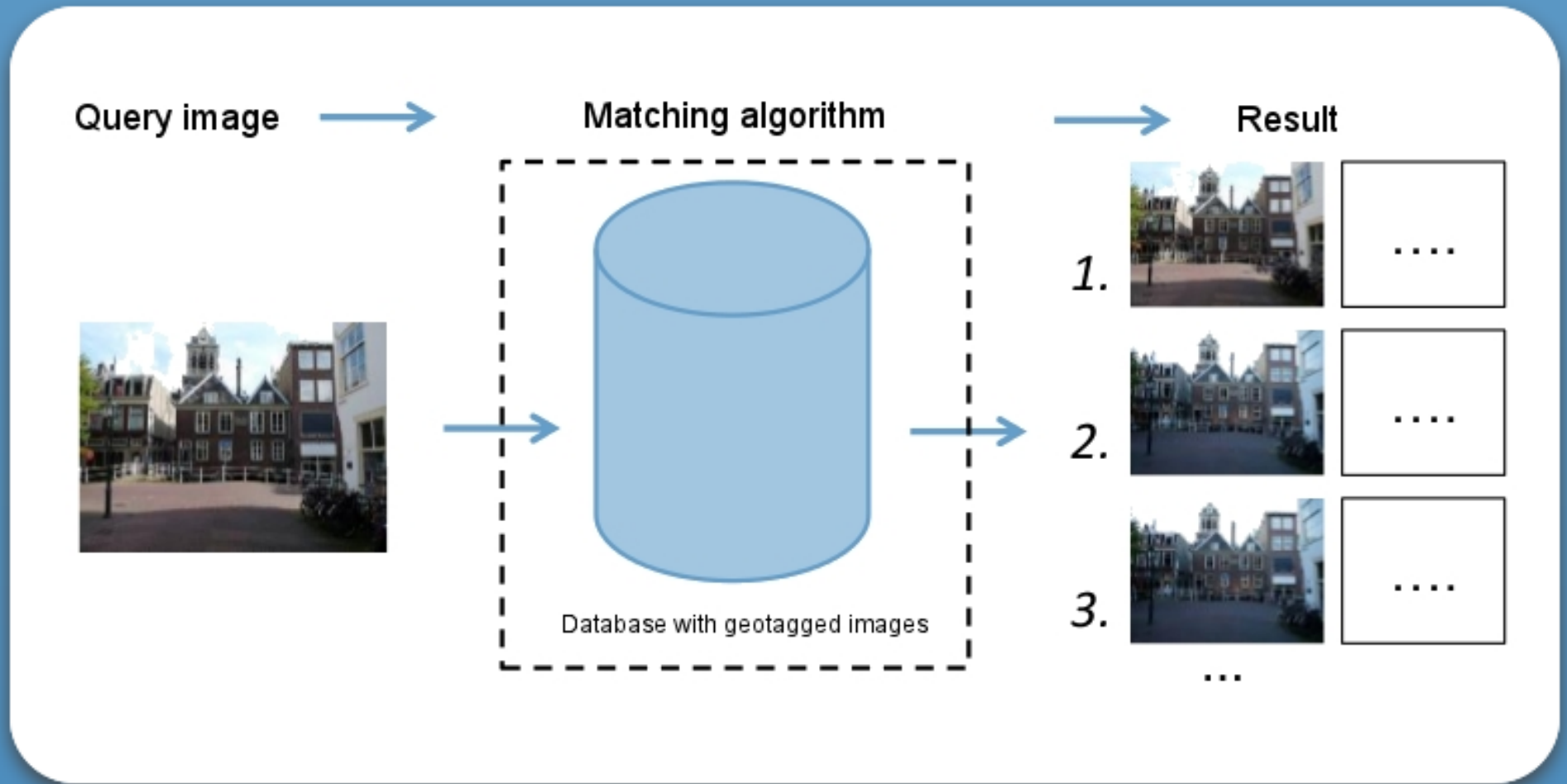
# Why?



# Method

- Create database with images
- Extracting descriptors from images
- Organizing data
- Matching algorithm

# Create database with images



- Google Streetview Crawler

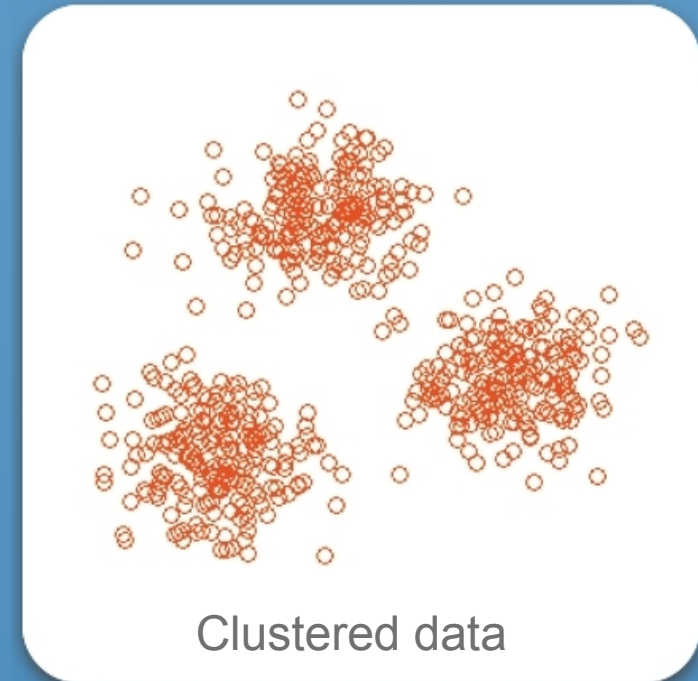
# Extracting descriptors from images



- SIFT descriptors
- 128D vector
- On average 1400 descriptors from an image with 1024x768 pixels

# Organizing data

- Large amounts of descriptors, lookups take a long time
- Idea: order data in tree structure
- Splitting 128D datapoints
- K-means clustering
- Result: leafs contain groups of very similar descriptors



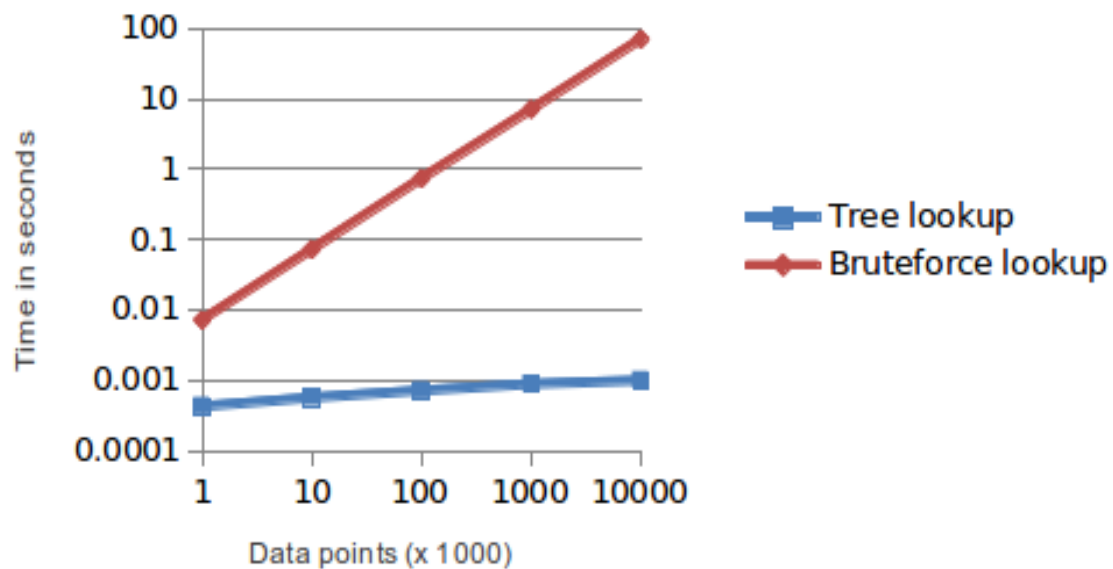
# Image lookup

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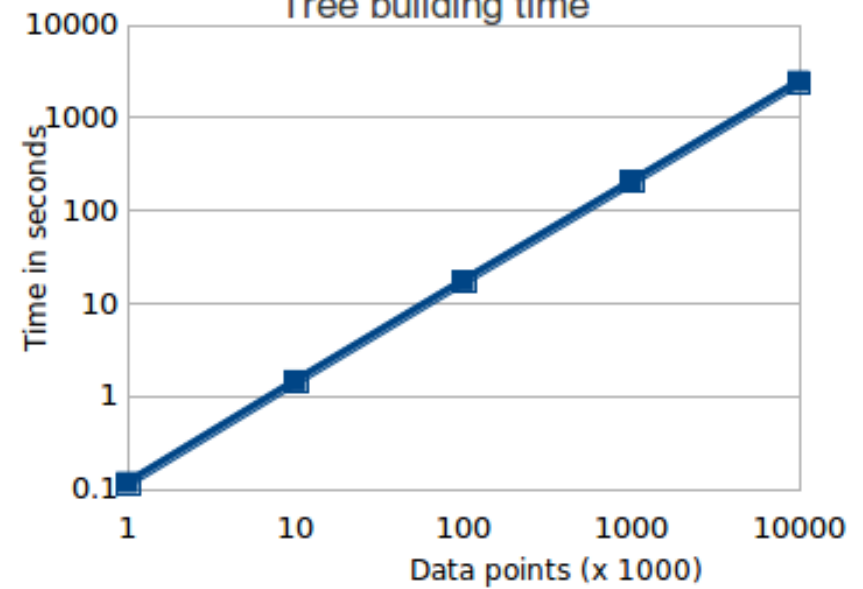
- Lookup procedure:
  - Determine closest child
  - Move to child
  - Do this until current node is a leaf
  - Select closest  $x$  descriptors in leaf, and add sources to candidate list
  - Repeat for every descriptor in query image
- Result: candidate list with scores

# Performance

### Tree lookup vs Bruteforce lookup



### Tree building time





# Scalability

- Scale to national level
  - 18 billion descriptors
  - Memory
  - Computation time

DEMO

Questions?

