Using Visual Features to Improve Tag Suggestions in Image Sharing Sites

Position of ..

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Agenda

- Motivation
- Proposed Architecture
- Current State
- Preliminary Conclusions

Motivation

- 5,000 + uploads per minute on Flickr.
  - Only 20%-25% are tagged
- Why are not all images tagged?
  - Benefits of tagging are obvious …
  - But effort is considered too high …

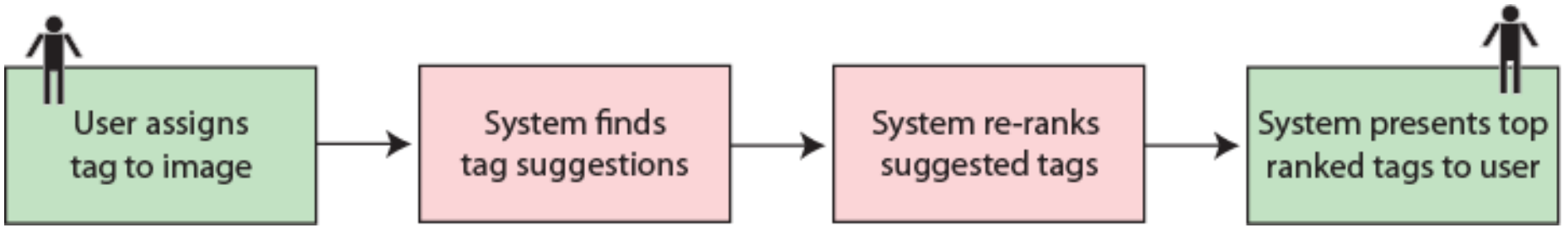
Focus on the annotation process ...

Motivation II

- Tagging images includes visual information
- Visual information retrieval in “narrow domains” has shown some success
  - … to bridge the semantic gap
- Tags as narrow domains?
  - e.g. *Ferrari* or *sunset*

Assumptions & Process

- User has selected/uploaded a photo
- User has assigned at least one tag
- Our Task:
  - Find more appropriate tags
  - Present them to the user
  - User decides which tags are “good”



Our Approach

1. Find possible suggestions (tag based)
2. Find image sets per suggestion
3. Compare input image to different image sets
4. Re-rank the possible suggestions

Example: Tag “juggling”

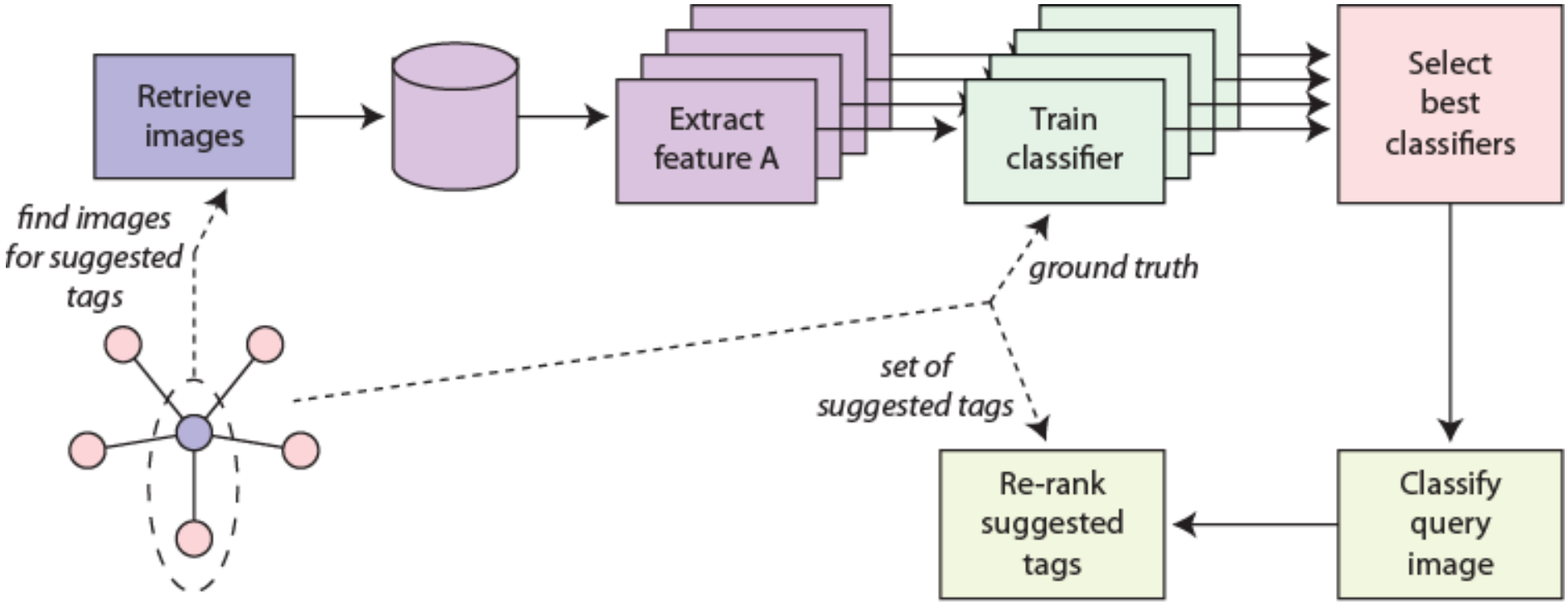
Input image

juggling + clown

juggling + fire

juggling + training

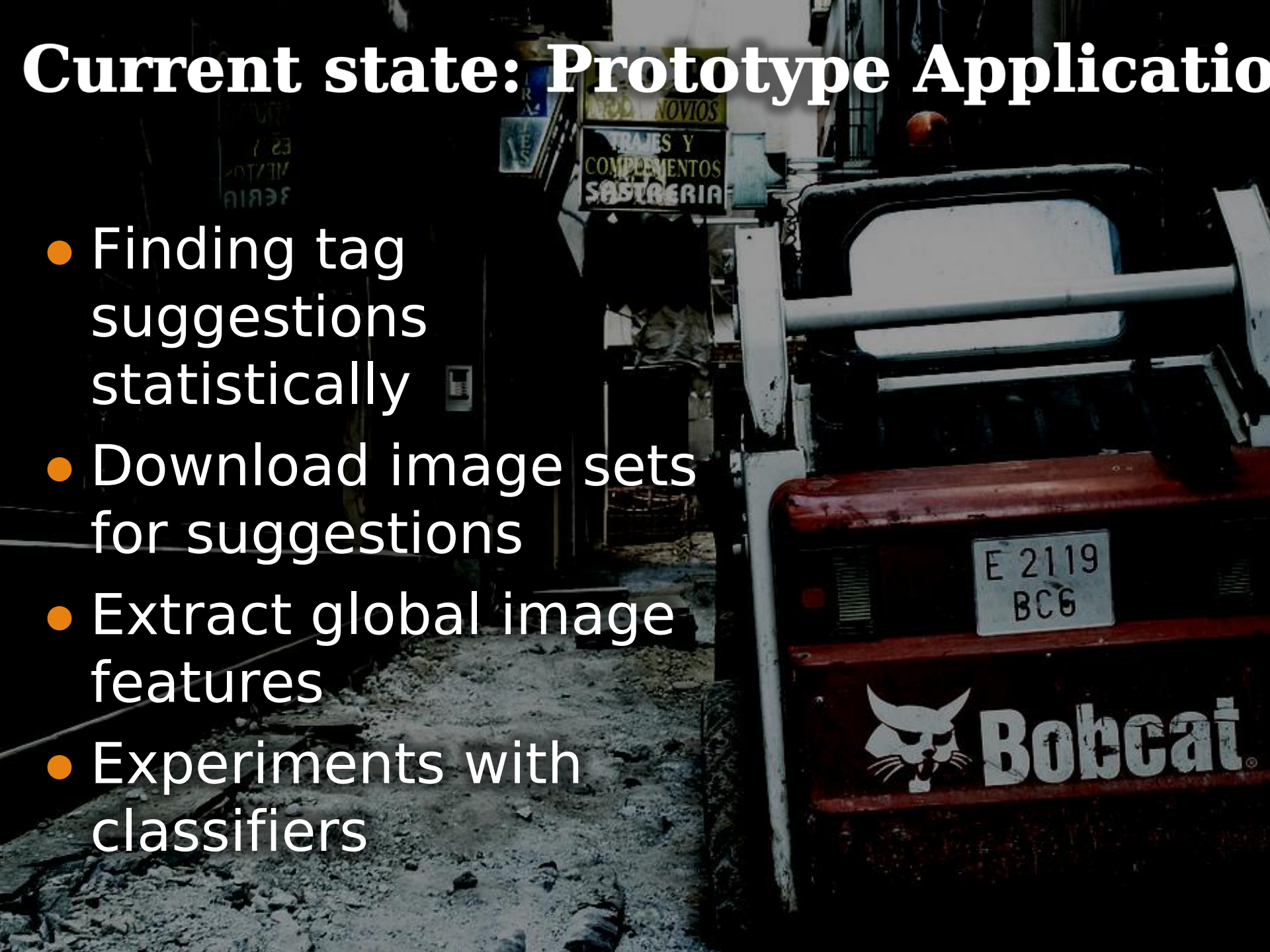
Architecture



Behind the curtains ...

- Image sets are “ground truth” for tag suggestion
- Several (arbitrary) features extracted
- Fuzzy classifiers are trained
- Best feature+classifier is selected
- Input image gets classified
- Best matching class is ranked highest, etc.

Current state: Prototype Applicatio

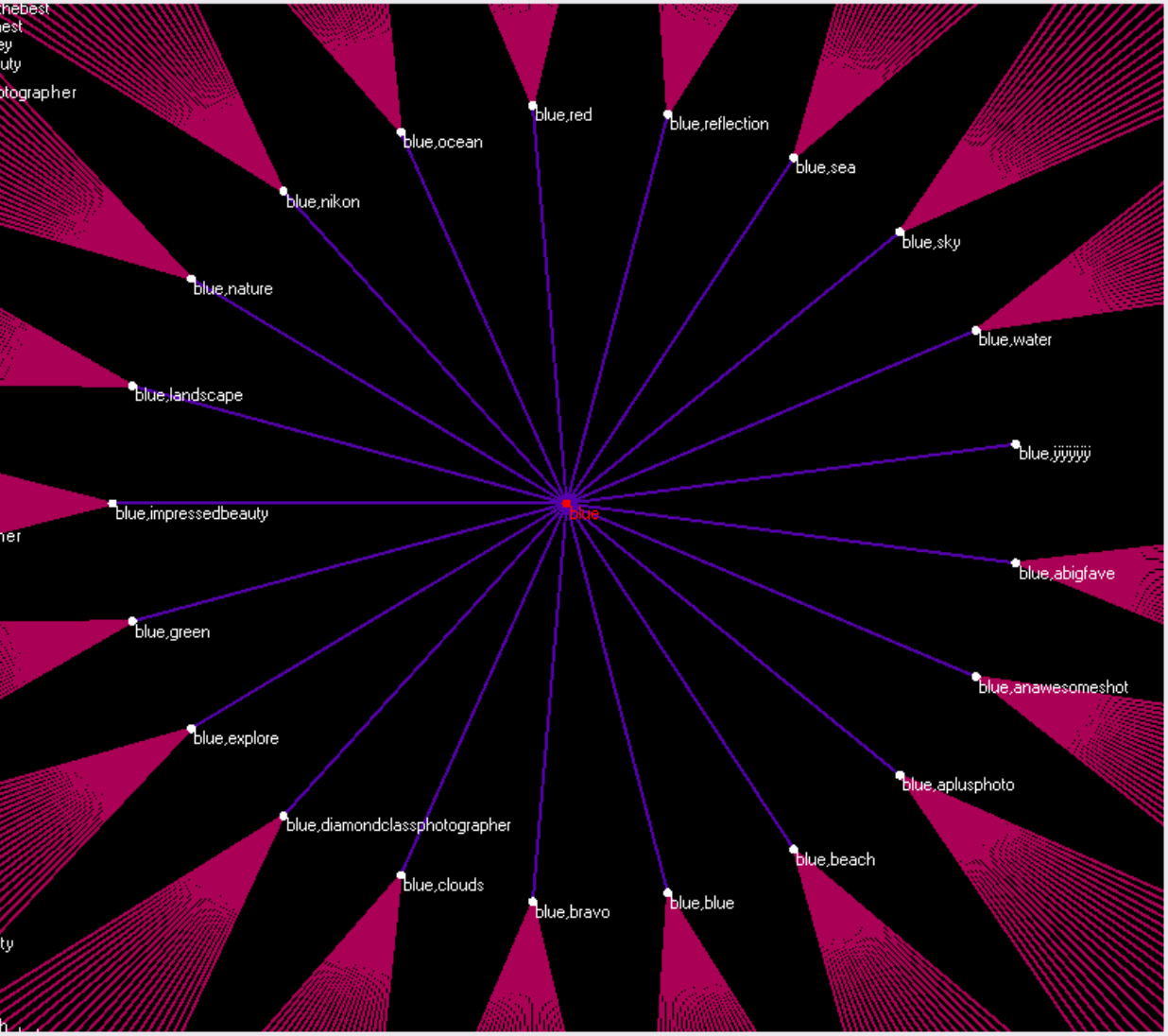


- Finding tag suggestions statistically
- Download image sets for suggestions
- Extract global image features
- Experiments with classifiers

Explore

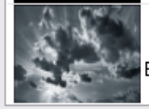
File View Cloud Tools Test

Zoom In Zoom Out



blue

Tag	Weight
blue,abigfave	56
blue,anawesomeshot	31
blue,aplusphoto	30
blue,beach	37
blue,blue	200
blue,bravo	28
blue,clouds	34
blue,diamondclassph...	27
blue,explore	26
blue,green	30
blue,impressedbeauty	24
blue,landscape	26
blue,nature	25

Title	Rank
 my li...	
 Rays	
 ----- ...	
 GOL...	
 Expl...	

Sel Tag Sel Pho Cluster

Type	Details
Mess...	Slickr.Communication.Messages.PhotoQuery blue,blue,bravo:Task Started
Succ...	Slickr.Communication.Messages.PhotoQuery blue,blue,beach:Task complete
Succ...	Slickr.Communication.Messages.PhotoQuery blue,blue,anawesomeshot:Task complete
Succ...	Slickr.Communication.Messages.PhotoQuery blue,blue,green:Task complete
Succ...	Slickr.Communication.Messages.PhotoQuery blue,blue,bravo:Task complete

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Preliminary Conclusions

- Efficient implementation poses an engineering problem (CBIR, network, …)
- Promising results for *some* tags
  - Found several tags considered as noise for our use case: *flickrdiamonds, abigfave, 1imageaday*, …
- We might find some “good questions” …
  - How to define a “narrow domain”?
  - How to find “narrow domains”?
  - etc.

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