

I. THE SITUATION

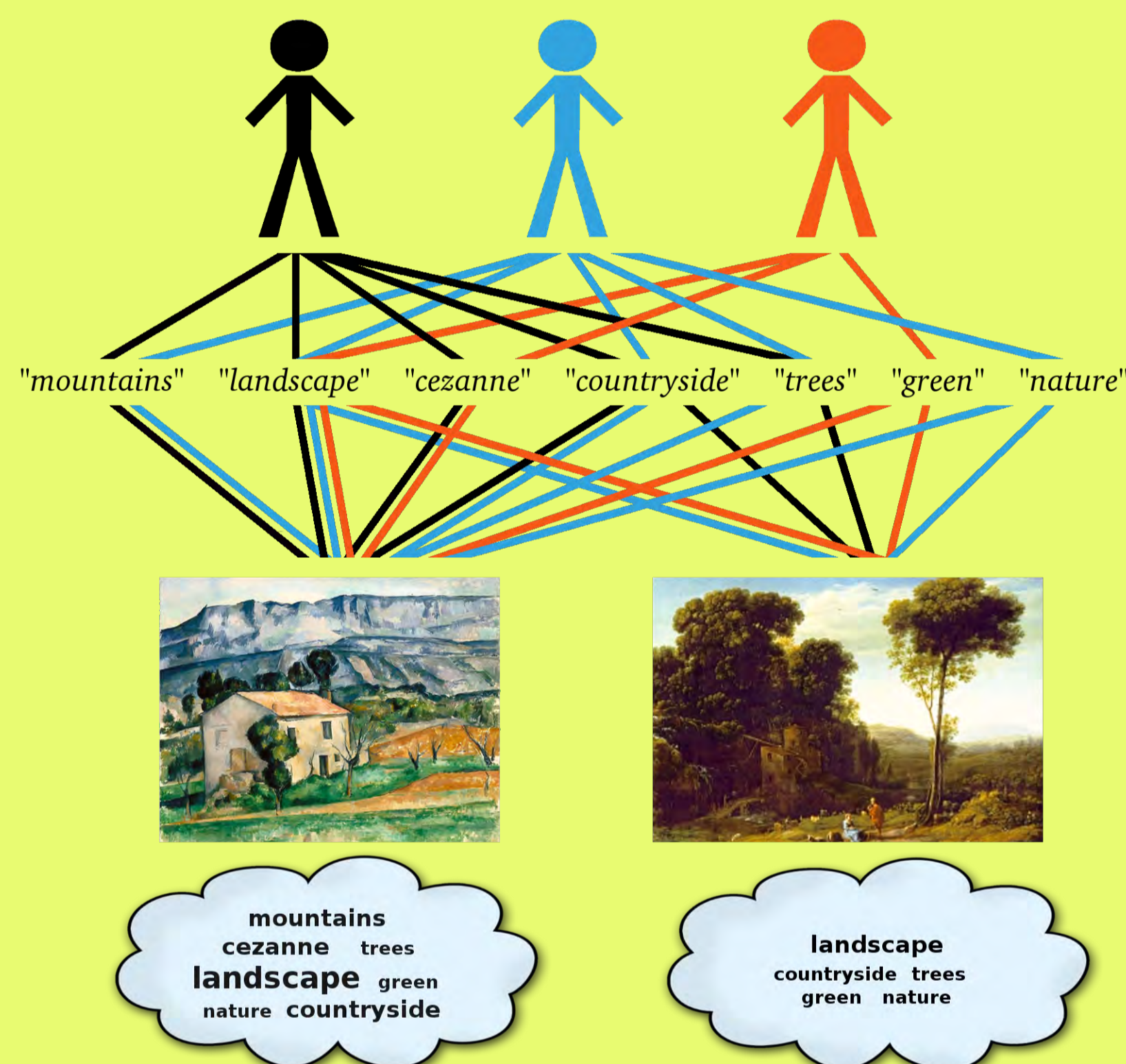
On a typical **tagging website** (e.g. Delicious, LastFM, Bibsonomy, LibraryThing etc.):



- ▶ Multiple users can assign **tags** (keywords) to the same document
- ▶ Each document forms a **tag cloud**, that visualises tag popularity within the document
- ▶ The entire collection of documents forms a **folksonomy**, i.e. a “folk” (crowd-sourced, emerging) “taxonomy” of documents

Here is a folksonomy of pictures:

- ▶ Users assign tags to images
- ▶ Some users have the same ‘opinion’
- ▶ Clouds form for each image:
 - ▶ e.g. “landscape” is large (popular) in the first tag cloud



II. THE IDEA



Look at a tag cloud! It resembles a paragraph summarising how the picture is perceived by the general public. This paragraph is very fragmented.

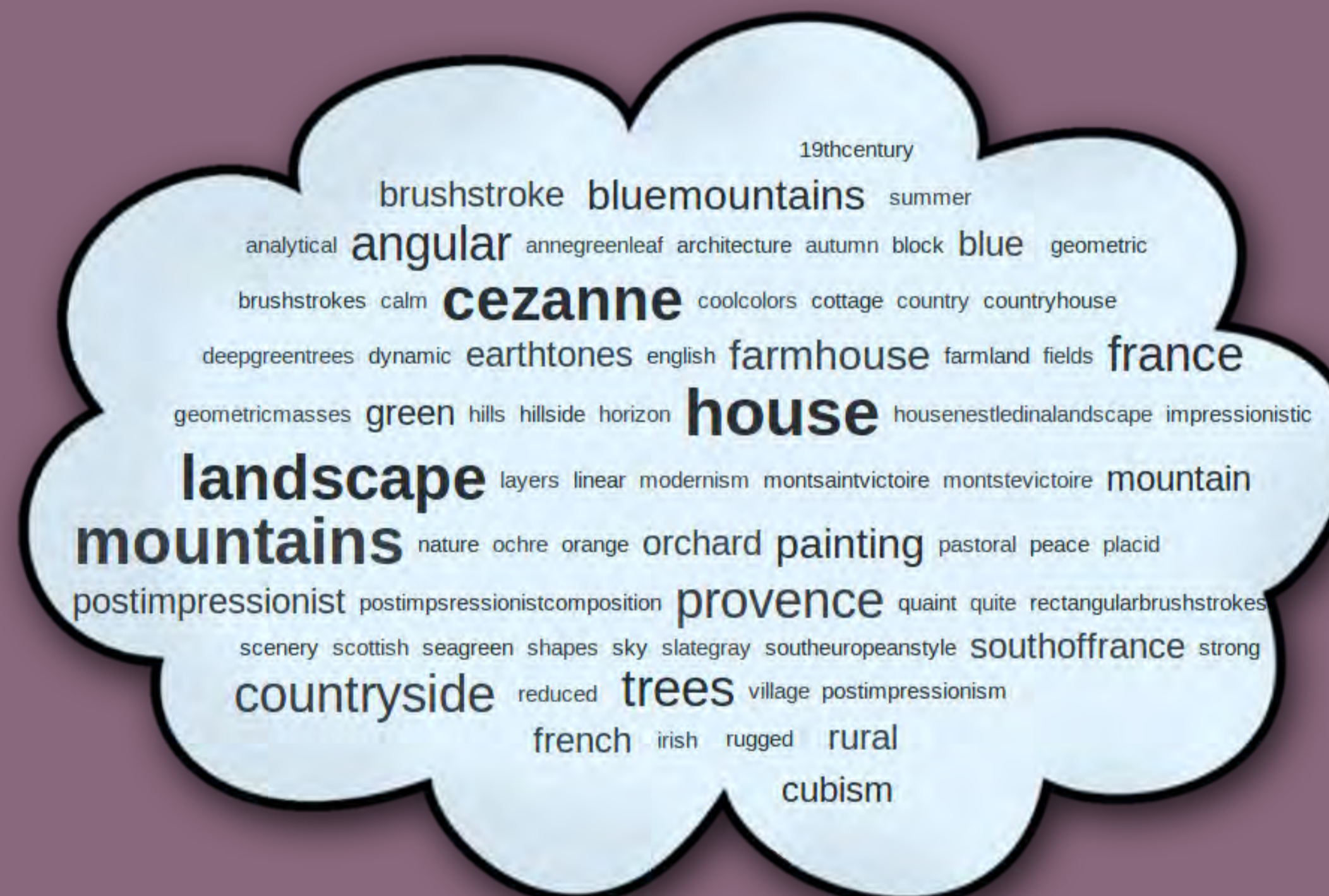
Can we fill in the gaps? Can we re-create (parts of) the underlying paragraph?

HOW? → Starting with simple triples like *Noun1 –relation– Noun2*

- ▶ *Noun1* and *Noun2* are tags usually found in corpora as nouns
- ▶ *relation* is whatever stretch of language can connect the nouns and make a ‘statement’ about the picture
- ▶ Nouns can be enriched with adjectives etc.

WHY? → It can help in:

- ▶ automatic caption generation
- ▶ more accurate search



- house** * **countryside** → house *in the* countryside
- painting** * **landscape** → painting *of a* landscape
- postimpressionist** **painting** * **cezanne** → post-impressionist painting *by* Cezanne
- house** * **blue** **mountains** → house *surrounded by* blue mountains
- trees** * **house** → trees *around the* house
- landscape** * **southfrance** → landscape *in the* South of France

For questions and bibliography please contact me on tt309@cam.ac.uk

III. THE PROCESS



FOCUS → on image folksonomies because this makes the task:

- ▶ more useful (generating text for non-textual data)
- ▶ more interesting (no supporting text to help the task)

STEPS:

1. Split multi-word tags (e.g. “housenestledinalandscape” → “house nestled in a landscape”)
2. Find tags that are likely to act as nouns (e.g. “mountains”)
3. Find pairs of related noun-tags, i.e. ones that it is worth extracting relations for (e.g. “painting” and “cezanne”).
4. Extract possible natural language ‘relations’ between each pair (e.g. “painting by Cezanne”, “painting composed by Cezanne”, “Cezanne is the artist of this painting” etc.)
5. Identify possible collocations (e.g. “post-impressionist” + “painting”) and expand the triples (e.g. “post-impressionist painting by Cezanne”)

IV. THE METHOD



DATASETS → folksonomies & supporting corpora

- ▶ *Steve Musuem* image folksonomy
- ▶ *Wikiwoods* corpus, *BNC* (British National Corpus)

MAIN TECHNIQUES

- ▶ *Distributional Semantics*
 - ▶ to find ‘related’ pairs of tags in the folksonomy (Step 3 above)
 - ▶ to find collocations from corpora (Step 5 above)
- ▶ Paraphrase-type noun-noun compound *Relation Extraction*
 - ▶ using corpora
 - ▶ using *wildcard* search engine queries (e.g. “trees * house”)

V. PAST, CURRENT & FUTURE WORK



DONE → Steps 1, 2, 3 and (partly) Steps 4 and 5
IN PROGRESS → analysing recently collected human data (208 participants providing both *paragraphs* and *tags* for images). We compare text vs. tags in order to:

- ▶ see what kind of text is underlying tag clouds
- ▶ perform some initial relation extraction

TO BE DONE → corpus- and search-engine-based relation extraction & (human) evaluation