

# Enrichment and Ranking of the YouTube Tag Space and Integration with the Linked Data Cloud



# Problem Statement

- Textual annotations vary in terms of quality and their ability to describe the video content.
  - Noise in tag
  - Irrelevant data
  - Incorrect data

# Solution Proposed

- Enrich the user-generated tag space
- Rank and interlink the tags to DBpedia concepts for greater integration with other datasets.

# Approach

- Problem
  - Three video resources may be described with three different tags “new york city”, “nyc” and “big apple” by three different users, but the intended meaning is the same, i.e. the city of New York.

# Approach

- Solution
  - Disambiguate each tag to an ontological concept identified by its own URI.

# Related Tag Studies

- Tag Suggestion
  - Gathering contextual data together with content processing to bridge the semantic gap.
  - Social data combined with a knowledge base to augment media with social annotations.

# Related Tag Studies

- Tag Ranking
  - Ranks assigned with respect to visual content
  - Tag depending on neighbors
    - supervised machine learning approaches, where models map relationships between visual features and semantic concepts

# Related Tag Studies

- Proposed Ranking
  - Proposed module is in the same general domain with the exception that
    - Tag space before ranking to tackle the problem of tag sparsity in YouTube videos.



# Semantic Tag Space Enrichment

1. Other textual contexts such as title and description of the video
2. Geospatial contexts, such as the place where the video has been recorded (latitude and longitude coordinates available through the YouTube API).
3. Temporal contexts, e.g. recording time.
4. Social contexts, e.g. groups or playlists that include the tagged video as an item.
5. Related videos, i.e. videos sharing some specific characteristics such as tags or time and space.
6. User contexts, such as the type of user that includes the video in their bookmarks or favorites list.
7. Context from the Web itself, i.e. other websites delivering information about these tags.

# Semantic Tag Space Enrichment

- We have considered the first five contextual sources to increase the tag space omitted the last two, which may be the subject of another study.
- We adopted a space and time normalization criteria in selecting the related videos.

<i>Original Video Tags</i>	<i>Related Video Tags Without Filter</i>
Planes, Air show, Galway	Planes, Air show, red_arrows, Volvo Ocean Race, Galway, Ireland, Panasonic, NV-GS330, NV, GS, 330, NV-GS
<i>Original Video Tags</i>	<i>Related Video Tags With Time and Space Filters</i>
"MOV04687", "Galway", "Ireland", "air show"	"heart", "festival", "raf", "in-port", "race", "beach", "galway_bay", "salthill", "Volvo Ocean Race", "red arrows", "beach"

# Tag Ranking

- Spreading activation
  - Information processing algorithm is based on the theory of cognitive science and human memory.
  - Activated node starts spreading its energy towards the neighboring nodes.
  - At the end of processing, all nodes will have some activation value which was contributed through its relation with neighboring nodes.

# Linked Data Creation

- Connect other related data from other media sharing sites. Eg
  - [Vimeo](#) or [Joost](#)

# Tags-to-Concept Mapping

1. If the tag matches with a **WordNet** noun, and if there is only one matching **synset**, we select the corresponding **WordNet** URI in **Dbpedia**.
2. If there are more than one **WordNet synset**, we send the tag and its context tags to a similarity module to compute the cosine similarity between the current tag context and already-existing tag URIs. (The similarity module is based on the Lucene7 text retrieval Java library and on other work in progress).
3. For those tags that are not part of **WordNet**, we send them to the semantic indexing engine **Sindice** to look for resources. Once we get the top k URIs for the query, the user can select the URI manually or else it is fed into another disambiguation module where URIs can be contextually disambiguated (not implemented yet).

# Future Work

- Tag-concept-matching.
- Application of the same to other similar media hosting sites.

# End

Questions ?

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