Video Categorization, Recommendation, and Search.

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Motivation

- It is important for farmers to stay up to date with the latest techniques, possibilities and success stories from others all around the world
  - Videos can be one of the most convenient sources of this information
- These days, a video library can easily be accessed and utilized by farmer groups using specialized mobile apps
  - If a farmer has a problem in the field, a video relevant to the problem can be recommended to him/her

Motivation

- YouTube provide a general-purpose solution for the task of video categorization and searching
  - Agriculture videos fall into a small cluster of all of YouTube videos
  - Every video on YouTube can be assigned exactly one category, which is chosen by the uploader from a fixed list of high-level domains like Education, Comedy, Music, Travel, etc. These are **too general**
  - Along with a category, uploaders also specify a list of tags for their videos. Although tags are usually more specific to the video, we observed that they are often **too granular**, and most of them do not re-occur in other videos
- Since both the categories and tags on YouTube are user-provided, they tend to have a lot of noise

What we need

- For reliable categorization of videos, where each category for a video can be treated as a facet for navigation and search, we need to find a categorization for videos at a granularity that is in between that of YouTube's categories and tags
- We also aim to reduce the noise and the lack of uniformity that is present in YouTube's categorization system

Objective

- We aim to evolve an agriculture-specific category catalog (the label space), from a large global category catalog such as Wikipedia
- Assign categories to videos from this agriculture-specific category catalog, providing a decent balance between granularity and cardinality of these categories
- Employ active learning to solicit user feedback during the categorization process
- Use our assigned categories to provide a recommendation and search facility to users
- Integrate video library search, navigation and recommendations into an Android app.
    - For more information about the Android app, click here.

Current progress

- We use WikipediaMiner to find a list of candidate categories for a given video from Wikipedia
- We use associative Markov networks[1] (AMN) to represent the similarities and dependencies between candidate categories for each video
- We solve an Integer Linear Programming (ILP) problem[2] on the AMN to determine the relevant categories from the candidate categories for each video

References

[1] “Personalized Classifiers: Evolving a Classifier from a Large Reference Knowledge Graph”, Ramakrishna B Bairi, Ganesh Ramakrishnan, Vikas Shindwani, IDEAS’14 July 07-09 2014, Porrto, Portugal

[2] “Learning associative Markov networks”, Ben Taskar, Vassil Chatalbashev, Daphne Koller, Proceedings of the twenty-first international conference on Machine learning, p.102, July 04-08, 2004, Banff, Alberta, Canada

Thank you.