While searching (googling) text documents has become a common task, finding relevant content in multimedia documents, images and videos, is still a non-trivial task. Unlike text, visual data requires complex processing to characterize its content in human understandable way. With the support of data mining techniques, state of the art high-level concept detection algorithms have made significant progress, but are still not on the par with humans and suffer from varying accuracy level. High level visual concepts may range from specific objects, to persons, emotions, actions, events, etc... Characterising videos leads to even greater complexity since different sequences (video fragment) are likely to contain varying content. There are a number of key challenges to overcome in order to enable content-based video search by mining knowledge from multimedia data. Given the media fragments, their multimodal features and high level concepts, the work will study and develop scalable indexing, searching, and mining approaches accounting for a) the diverse temporal granularity at which high level concepts are defined, b) the variety of features and high level concepts characterising media fragments and c) the unequal importance and relevance of features and facets which requires advanced fusion based multimodal retrieval.
### Objectives
The main research objective is to study and develop a highly scalable indexing scheme for uncertain multimodal data (numeric and alphanumeric), based on data mining techniques, to enable effective content-based multimedia search and retrieval. The work will be performed in the context of the TrecVid Hyperlinking task (http://www-nlpir.nist.gov/projects/tv2015/tv2015.html#lnk) and the MediaEval Search and Anchoring in Video Archives (SAVA) task (http://www.multimediaeval.org/mediaeval2015/) which provide both a dataset containing pre-extracted features and a partial ground-truth. The research activity will follow two tracks in parallel; a traditional one based on ranking of fused classifier outputs and an innovative one performing multimodal indexing. The final objective is to evaluate strong and weak points of both approaches by means of a direct comparison addressing both effectiveness and efficiency.

### Skills and competencies for the development of the activity
The candidate should be characterized by a strong interest in algorithm design and development, and good programming capabilities. Knowledge of data mining algorithms, NO-SQL databases and the Hadoop ecosystem would be a plus.