

Ph.D. topic 2015  
“Events” detection in videos

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Presentation of the Ph.D. topic

With the proliferation of mobile and wearable devices equipped with cameras, the amount of video data recorded by individuals has increased dramatically. This data needs to be organized and managed, and meaningful information should be inferred from this data to allow users to easily search and retrieve interested content from the recording. Many research about media content understanding focus on individual objects. However, most “events” occurring in images and videos involves multiple objects, like “crossing”, “going towards”, etc.. These events also imply a temporal aspect, with a strict chronological order of spatial organization, defining an event, such as crossing a road. Furthermore objects are usually not clearly defined in images and videos and only fuzzy objects may be available in a “map of interest”.

Expected deliverables

The Ph.D. objective is to propose a framework for events detection in images and videos, either 2D or 3D. The first objective will be to extract spatial information about objects in video frames. Since the objects may be only available as fuzzy objects, the classical notion of spatial relationship, such as the mereotopological approach proposed by Randell et al. (2012, IEEE PAMI), should be redefined to build a formalized model of spatial information between multiple fuzzy objects. The relation “between” is of particular interest because it is involved in many spatial and temporal events. The spatial relationships between objects will then be processed in order to extract meaningful information in videos and identify possible events.

Many applications are planned in different areas with different Singaporeans collaborators in Institute of InfoComm Research (I2R), National University of Singapore (NUS) and BioInformatics Institute (BII).

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### Keywords

Video, segmentation, spatial organization

### Applicant profile

- Master Degree or Engineer Student (last year of studies).
- Skills in programming, preferably JAVA, and Matlab.
- Notions in image and video processing.
- Open to work with both French and Singaporean scientists
- Availability for starting October 2015.

**Gratification:** Compliant to French Regulation on Ph.D. students (Contrat doctoral)

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