

Seminar Abstracts



Cantate Seminar
2 April 2009
9:30 – 12:30

Location:
CRP Henri Tudor
29, Ave. J.F. Kennedy
L-1855
Luxembourg-Kirchberg

Authenticated video streaming (L. Guillemot, Codasystem)

Mobile devices can be seen as an extension of a content-analysis system: as an additional camera at the beginning of process and as an enhanced alarm at the end of the chain. Codasystem proposes a secure video capture for mobile phones (automatically transmitted) and allows location certification and time stamping of the incident using cryptographic tools. Codasystem is also designing a system where the alerts generated by the CANTATA content-analysis system is automatically transmitted (using a secure protocol) to a mobile device. A SMS is first send including the description (metadata) and the location of the incident preceding the video.

User test of soccer highlights detection (P. Fonseca, Philips Research)

This paper describes an evaluation of a consumer application for soccer-highlights detection, which combines advanced user interaction with an underlying automatic highlights detection algorithm. The application was developed for a home entertainment setting, i.e., for non-professional use, and was implemented on a Media Center PC with a remote control. The evaluation uses a qualitative assessment to measure the participants' satisfaction with the application, and investigates their satisfaction regarding several important factors, such as the participants' expectations and their satisfaction with the highlights. In the evaluation, we found that the participants' expectations regarding a soccer highlights detection application vary widely, and there is a gap between what participants expect and what any automatic detection application can provide. Despite this gap, the results from the qualitative assessment indicate that the application is very positively perceived by the participants. The results indicate that the participants showed positive satisfaction with the application, especially in its ease-of-learning, ease-of-use, and the feeling of being in control. Moreover, the results suggest new and further tuned user requirements that help improve satisfaction with the application.

Content-aware ambient lighting for TV (J. de Vet, Philips ilabs)

The ambient lighting technology (ambilight, for short) currently available in the market, generates light effects around the TV that correspond to the pixels that make up each video image. The effect is a larger virtual screen and a more immersive viewing experience. The adaptive ambilight technology developed in CANTATA additionally adapts to the user and the type of content (genre). Experimental research has shown that adaptive ambilight can intensify emotional consequence and enhance presence for certain content genres (e.g. cartoons). Several ambilight profiles have been defined and implemented. Each channel can thus have the most optimal ambilight settings for the particular TV viewer.

Computer-aided lung-emboli diagnosis (R. Truyen, Philips Healthcare)

Deep vein thrombosis and its fatal complication pulmonary embolism (PE) pose a serious health problem. It is estimated that in the EU and US combined 2.5 million people develop pulmonary embolism each year with fatal results in roughly 30% of the cases.

The advent of multi-detector computed tomography (MDCT) has radically changed the diagnosis of pulmonary embolism in symptomatic patients. The technique is fast, patient friendly and not only has better sensitivity to rule in PE. As the radiologist needs to read a stack of hundreds of images good visualization is a necessity for quick and confident diagnosis, especially to find the smaller, isolated emboli. In the CANTATA project we developed image processing and computer aided detection software that can help improve diagnosis of PE - those tools are currently under clinical evaluation and will find their way to products soon.

Alerts semantic-based detection (D. Nicolas, CRP Henri Tudor)

One of the CANTATA systems presented by TUDOR and jointly developed with TU/e and VDG is an automatic generator of alarms.

In the context of a bank-surveillance scenario, the systems combines numerical and semantic analysis, automatically and in near-real time, of the filmed scene(s), and at the same time taking the context (e.g. a hall of the bank) and the various elements such as gun detection and raised-hands recognition into account allowing the release of alarms. Alerts are then displayed on the monitor screen with an adapted color according to its level of threat.

Human motion analysis (W. Lao, TU/e)

With the continuous improvements in video-analysis techniques, automatic low-cost video surveillance gradually emerges for consumer applications. Successful trajectory estimation and human-body modeling facilitate the semantic analysis of human activities in video sequences. We study a flexible framework for automatic analysis of human behavior and semantic events. The total framework consists of four processing levels: (1) a pre-processing level including background modeling and multiple-person detection, (2) an object-based level performing trajectory estimation and posture classification, (3) an event-based level for semantic analysis, and (4) a visualization level including camera calibration and 3-D scene reconstruction. We show attractive experimental results, highlighting the system efficiency and classification capability.

Video stream authentication technology (Y. Stadler, Codasystem)

The presentation discusses a video authentication system, based on the Codasystem certification chain. It is divided in three main points. Firstly, geo-location and time-stamping information (allowing content authentication) are watermarked within the video. Secondly, video is encrypted and transmitted using the IPSEC protocol. Finally, the video is stored on the server after watermarking extraction and video authentication. In this presentation we focus on the presentation of the watermarking step and the IPSEC protocol, in particular we will show how these tools provide the security services: integrity check, authentication and confidentiality.

Validation of content-aware systems (C. Marchessoux, Barco)

Validation is an important and crucial phase for multimedia content-analysis systems. For CANTATA, three virtual specialists per domain were developed:

- a virtual TV announcer for home multimedia;
- a virtual surveillance security officer;
- and a virtual medical physician.

The systems are based on multimedia content like video, images or audio. The validation framework consists of: a dataset, a Multimedia Content-Analysis (MCA) algorithm, a Ground Truth, an evaluation module based on metrics (subjective and objective) and a presentation module. The CANTATA project reveals these insights, particularly since different application domains are taken into account. During the seminar, the common and objective validation methodology will be presented.