

Chair Media Informatics

The Chair Media Informatics of Chemnitz University of Technology focuses on the area of Human-Computer-Interaction, Multimedia-Information-Retrieval and Media Distribution. These complex subjects are combined and investigated in the research projects sachsMedia, ValidAX and crossWorlds.

sachsMedia

The junior research group sachsMedia is engaged in the research area of media analysis, retrieval, database-supported storage of media data and associated meta-data, and distribution of media. Methods for automatic detection and identification of persons, buildings and objects are developed and combined into the platform independent framework called AMOPA.

Furthermore, speakers are detected and identified and speech is recognized and transformed into metadata. sachsMedia also develops a semiautomatic tool that provides a fast and high quality annotation of any media and allows to generate extensive and meaningful metadata. Searches in media archives are made possible through the Xtrieval framework, being capable of searching audiovisual and text-based content.

Additionally, new ways of distributing digital media, like Video-on-Demand, Live-Streaming over the Internet or Digital Television, are researched and developed further. Special attention is directed to the conversion of media for the designated distribution channels, like DVB-T, DVB-C, DVB-S, DVB-H, IPTV or DMB.

ValidAX

The project ValidAX uses the techniques developed in sachsMedia and extends them. The technology is optimized and additional knowledge is going to be integrated. For this purpose, an archiving system with automatic and parallel ingests of various types of analog and digital tapes has already been built. Media is captured, analyzed, transcoded, stored and distributed in various formats. All these steps are under permanent investigation to increase the quality and error robustness of the system and to validate its efficiency for future commercial use.

CrossWorlds

CrossWorlds is an interdisciplinary post graduate program that investigates the effects of rising digitization in relation to the connection between virtual and real spaces, especially in the areas of communication, emotion, sensomotoric and learning.

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Enhancing
the media lifecycle





Digital Archive

Media management has become an important part of many businesses that deal with media on a large scale. This sensitive and precious data is often copied, edited, rearranged, enriched with metadata, and used by other players in the company. Our solution ensures an optimal access to the managed content.

Moreover, we can back up the media data using online, nearline, and offline storage to ensure that the danger of data loss is at an absolute minimum.

Our handling of metadata deals with preprocessing and collecting both intellectually and automatically extracted metadata in order to retrieve audiovisual data. For that purpose we develop, implement, and evaluate approaches for text and content-based retrieval.

With increasing size, searching for certain information in such archives becomes extremely difficult. For solving this problem, in conjunction with handling metadata, a web service has been set-up and is verified within our test bed for archiving processes.

Analysis

In the field of video analysis, structural decompositions are utilized to semantically arrange shots acquired from video streams. The recognition of scenes, persons, and objects are the basis for an automatically generated extensive index.

To improve the process of video annotation there is a need for special tools. Our existing solution will be improved regarding usability as well as platform independency. Furthermore, it will support motion tracking and text alignment.

In terms of audio analysis, we address algorithms for in depth text, speaker, and speech recognition. Appropriate combinations of approaches to derive semantic relationships between the emerging information in subsequent steps will improve their detection rate.

Automatically, the extracted information is merged into a collection of metadata which enriches the content of the media files. The documentation of large and rapidly growing video collections and the processing of existing archives will require a significant increase in performance. Therefore, we focus on parallel processing methods by analyzing the concrete manifestation of parallelism in order to create an impact in commercial use cases.

Ingest

Only few archives can afford a manual description of their media, at least partially. Usually, they remain unused on analog or digital data sources. Searching through them is not possible or at least very difficult. The digitization of analog media along with performing automatic image and speech recognition in digitized as well as digital media and the support for creating indexes enables extensive searches in the media archives.

We are able to capture the content of different video tape formats such as Betacam, DV, MiniDV, VHS and S-VHS in real time, transfer it into our digital management and storage system, and transform it into state-of-the-art video files.

In order to perform the ingest more efficiently, we built an automatic ingest system with up to 10 parallel input channels based on professional capture devices. All working steps in this system are monitored and controlled by our own in-house software solution. This increases both, automation as well as error robustness.

Production & Distribution

The extension of conventional digital broadcasting, with regards to the developments of the internet and the world of next generation networks, is our mayor research goal in the field of media distribution. In this context we examine usage, efficiency, and performance of supplements such as data services, back-channel capability, quality of service, and intelligent distribution channels. Our test bed comprises a complete chain, beginning with the production in our own TV studio, including digital post-production, multi-channel playout, transmission to the recipients, and professional measuring technology for a profound evaluation.

Our research also focuses on media transcoding issues and the handling of complex distribution workflows. Media transcoding forms the technological core to configure an optimal data transport between providers, archives, and consumers. Here, the challenge is to transcode in real time. We explore compression technologies for A/V streams and develop adequate conversion methods. The result will be a flexible transcoding framework which processes video information of any quality level in real time.

Additionally, we take care of handling, combining, and applying metadata in the field of interactive rich media in order to increase the benefit for the user. With the broad knowledge gained from user studies we develop customizable and multimodal graphical user interfaces to facilitate retrieval processes in professional audiovisual content repositories.