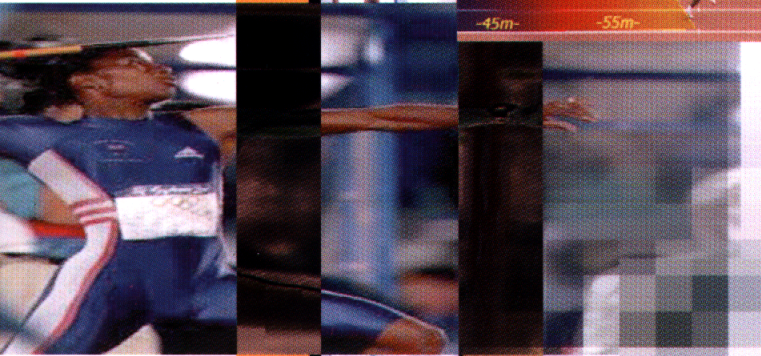
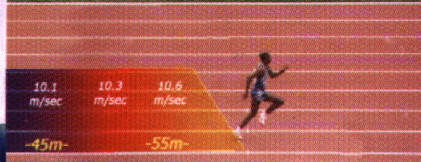


PISTE

Personalised Immersive
Sports TV Experience



The PISTE Project

The IST Project PISTE (IST-1999-11172) aims at the building of a system that comprises the infrastructure for creating, transmitting and receiving enhanced, interactive video for sports broadcasting. The PISTE system provides facilities for broadcasters to effectively create and transmit visual enhancements along with a sports broadcasting as well as the means for the viewers at home to interact with the received content and adjust it to their personal preferences and selections.

The PISTE project is building a system, addressing the needs of broadcasters and home viewers, which will transform TV watching into an immersive interactive experience during the coverage of sports events.

The main objectives of PISTE are:

- a) The provision of tools based on digital video processing, 3D-visualisation and animation techniques, and a novel virtual scene modelling language to broadcasters, for creating augmented reality views of the events.
- b) The development of tools for the encoding and playback of rich interactive multimedia content in MPEG-4. The assessment of MPEG-4 for broadcasting such content over a DVB infrastructure and its presentation on set-top equipment.
- c) The specification of requirements for the implementation of MPEG-4 playback on consumer electronics equipment.
- d) The assessment of the DVB infrastructure in supporting large scale Virtual Environments through the use of MPEG-4.
- e) The assessment of the system through experiments with the involvement of real actors.

The PISTE System

The PISTE system provides a complete architecture for:

1. The enhancement of visual content to be provided by broadcasters of sports events and
2. The visualisation of additional information within the broadcasted video and replay sequences on advanced set top devices that allow user interaction and a high degree of participation and personalisation.

For this purpose the PISTE consortium implements two distinct systems:

- A sender platform to be deployed within the premises of the broadcasting corporation (in the case of sports broadcasting these premises are the mobile studio units positioned on site). This platform includes tools for the off-line

preparation activities of visual enhancements creation, tools for the on-line creation of the visual enhancements, i.e. the projection of added value and supplementary information during broadcasting, and finally tools for the administration and management of these two subsystems. It can be thought of as an advanced editing tool for sports broadcasting with added value in the transmission component

- A receiver platform in order for the viewers across Europe to be able to interact with the enhanced content transmitted by the broadcasters. The set-top-box to be developed for this purpose implements these interaction facilities in a user-friendly way taking into account the limitations of the interaction medium (primarily remote control) and the fact that many of the viewers lack the

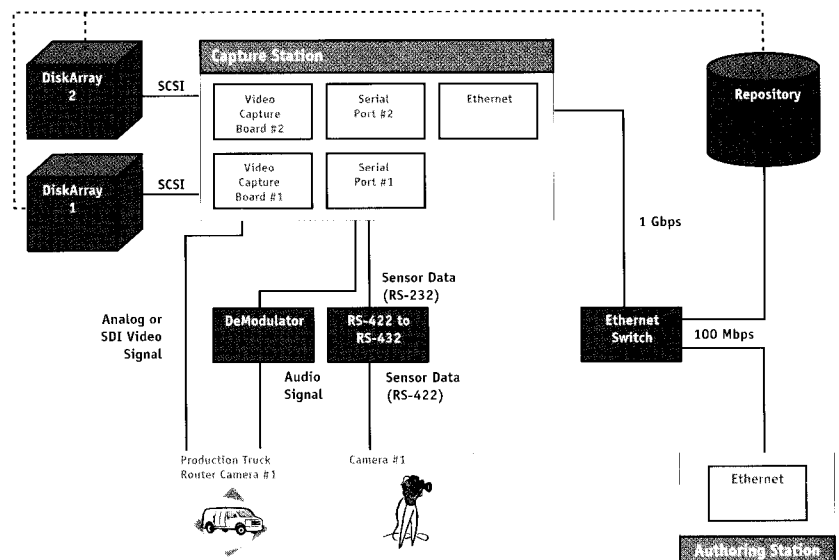


Figure 2: Capturing and Digitization

The hardware architecture for the capturing and digitization of the incoming live feed. The sensor data comes either directly from the camera over its RS-422 interface or within the audio signal from the production truck (hence the two paths in the lower part of the figure should be considered as two alternatives).

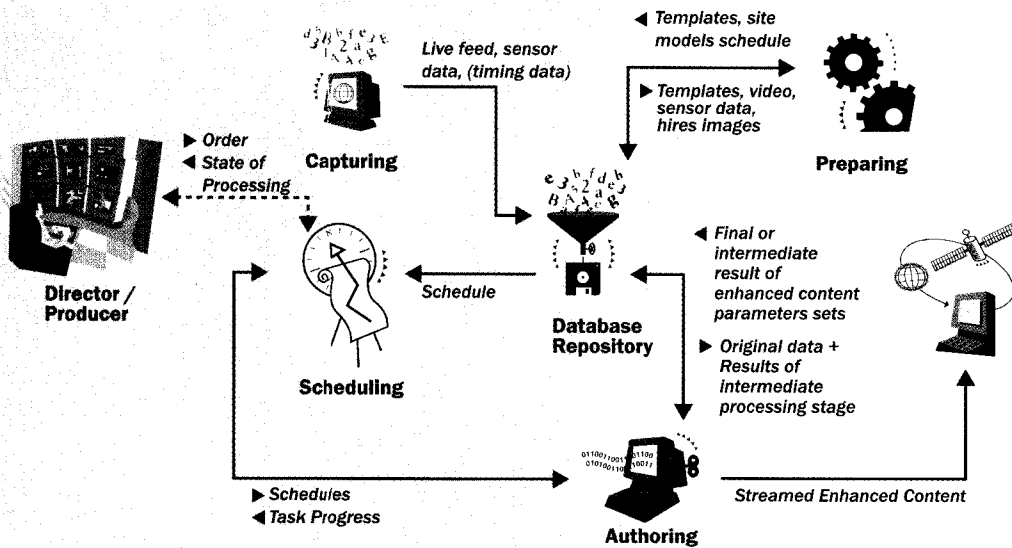


Figure 1: Abstract Schema of the Sender Architecture

An abstract schema of the sender architecture grouping tasks and subsystems according to the major (temporal) categories of the broadcasting software. The information transmitted (information along the arrows) is also presented in abstract high-level units.

experience of computer usage ("computer illiterate" viewers).

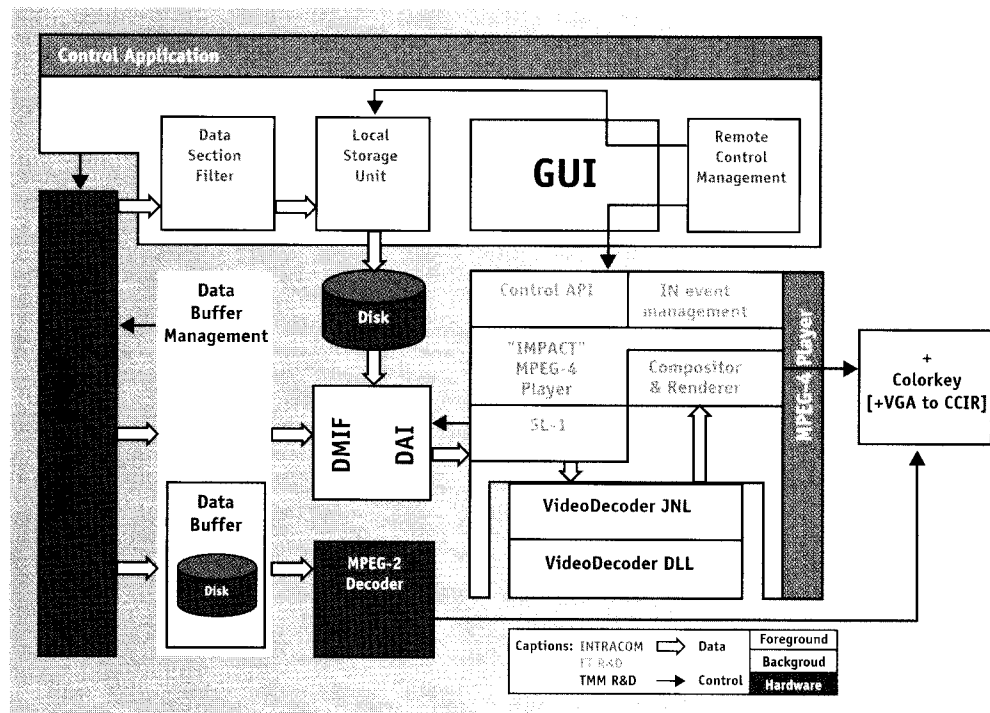
The viewer is offered the possibility to personalise the received information, e.g. receive enhanced information only for sports that may be of interest to him/her.

The systems under development take into consideration the optimisation of reaction times of the system in its interface to both broadcasters and viewers.

Special attention is paid to the smooth and seamless integra-

tion of the sender side system into the workflow of the broadcasting corporations.

Extensive interviews and surveys with involved broadcasters and users form the basis for the design and implementation.



PISTE Technology

For the accomplishment of its goals, PISTE will be based on novel standards in the realm of multi-media, such as MPEG-4. The preparation of the content on the sender side will include advanced techniques in:

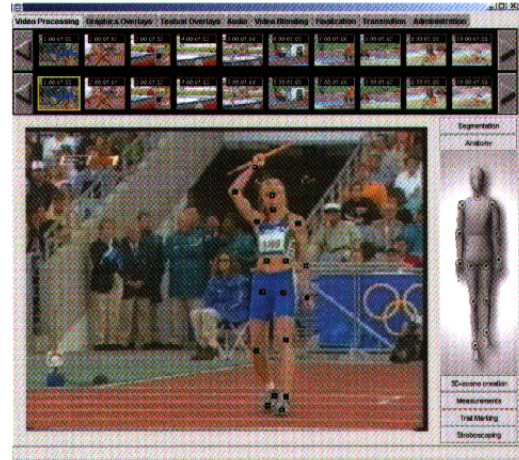
- Preparation of the digital infrastructure for a broadcasting session
- Capturing and digitisation of camera feeds
- Digital video processing and analysis (user monitored segmentation, mosaicking)
- 3-dimensional pose estimation projected onto configurable avatars

• 3-dimensional reconstruction

- Advanced video blending techniques
- Dynamic Scene Generation based on templates
- MPEG-4 encoding and transmission over DVB

The receiver will deploy advanced techniques for:

- MPEG-2/4 Demultiplexing and simultaneous display of content in both formats
- MPEG-4 Player covering most features of the standard and focusing on graphics scenery
- Advanced set-top-box controls and efficient handling of the local storage



Screen: The Broadcaster's Authoring Tools

A mock-up for a possible graphical user interface of the authoring tool. In the upper part all different modules of the authoring suite are shown as tabs that will activate the corresponding interface. In the lower right there is a user interface element as introduced by Microsoft™ in various desktop software systems.

Participants



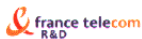
INTRACOM S.A. GR



UoC GR



TMMRDF F



CNET F



Teltec IR



PUE PL



FhG/IGD D



ZGDV D

PHL IR



ERT GR



IMT SW



EPFL SW

Start Date:

May 1st, 2000

Duration:

30 months

Contact Point:

Dr. Athanassios M. Demiris

INTRACOM S.A.

Markopoulo Ave.

190 02 Peania, Athens, Greece

Tel.: (+30-1) 6690 436, 6690 000

Fax: (+30-1) 6860 312

e-mail: dema@intranet.gr

<http://piste.intranet.gr>

<http://www.ert.gr/piste>