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Experts Group for ATM Video Coding

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Title : RACE 2072 Mobile Audio Visual Terminal (MAVT); Project information

Purpose : Information

1 Main Objectives

Universal Mobile Telecommunication Systems (UMTS) is the generic name of third generation mobile telecomunication systems. The objective of RACE 2072 MAVT is to find a powerful video and audio coding algorithm for transmission of moving and still video in a mobile environment like UMTS and to implement these algorithms together with the audio coding algorithm on a demonstrator called MAVT (Mobile Audio Visual Terminal). Thus a study of user requirements, network and channel-characteristics, service definition and a general terminal architecture is mandatory and will deliver a future terminal with several different features, displaying moving video, still video and graphics in different resolution in space and time and also a good voice quality with handsfree processing.
Partners in this RACE project come from six European countries: Germany, Portugal, France, United Kingdom, Spain and the Netherlands.

2 Technical Approach

The first task in the project is to give a clear definition of possible video and audio services in UMTS regarding user requirements in different situations.
After having defined quality criteria for different services it must be proved whether the demanded quality can be achieved in the network. This can be done by an initial research on the expected error rates for different environments or an existing radio channel model will be taken. If the expected network performances are too bad, new correction protocols have to be developed, or alternatively, some restrictions to the application areas have to be imposed. In the field of low bitrate coding reference can be made on research in videotelephony. In a first approach this algorithm will be used as a basis. Further work will be done on new coding methods in order to investigate a flexible algorithm for px8kbit/s. One of the most important tasks is research in channel coding for mobile video transmission. New methods like RCPC Codes and a flexible exchange between source and channel data rates will be analysed as well as combined source and channel coding methods. Since at the end of the project it should be possible to show the results on a demonstrator, hardware will be build using a DECT (Digital European Cordless Telephone) environment. This

hardware will consist of multiprocessor DSP's and VLSI's.

3 Key issues

- Service Definition and User Requirements
- Influence of Network and Channel Characteristic
- Suitable video and audio coding algorithm
- Channel error protecting for video and audio
- System Control
- Demonstrator realization with modern DSP's and VLSI
- Using of modern software tools for hardware implementation
- Complete integration in a PC environment

4 Expected Impact

Since video services will widen in office communications and step by step in private households, they will be needed also in mobile networks. This project is dedicated to the task of making these video services also available for mobile networks, especially for UMTS.
In office communication wireless transmission will be possible (DECT or radio LAN) at least in a wireless PC. Interactive graphic and still video communication on handhelds, which are connected to a mobile network (DECT or UMTS) is also an interesting service, supporting applications in many sectors of the economy.
The mobile videophone is one of the most attractive applications of this project and will be possible in different qualities in dependence of the channel characteristics and the available bandwidth in UMTS.
The project will also initialize standardization and will help to find new applications for mobile networks and influence the development of complex VLSI's in the semiconductor industry thus promoting new VLSI technologies.

5 Participants

Robert Bosch GmbH	Germany
Instituto Superior Technico	Portugal
ITIS	France
Matra Communication	France
PTT Research	Netherlands
Queen Mary and Westfield College	United Kingdom
Siemens AG	Germany
Telefonica de Espaea	Spain
Thomson-CSF/LER	France