

What is Multitel ?

Founded in Belgium in 1995 by the Electromagnetism and Telecommunications and the Theory of Circuits and Signal Processing departments of the "Faculté Polytechnique de Mons" and the Telecommunication and Teledetection Laboratory of the Université Catholique de Louvain, the applied Research Centre Multitel is an initiative supported by the Objective One and Phasing Out programmes of the European Commission and the Walloon Government.

Multitel is an independent Research Centre with teams specialised in the following areas : image processing, speech and signal processing, photonics and networking.

. Speech and Signal Processing : Multimodal man-machine interfaces, patented speech recognition technologies, multi-sensor mobile positioning, speech-based information retrieval, systems for analysing, indexing, archiving and retrieving large sets of multimedia documents.

. Image Processing : traceability, video content analysis, machine vision.

. Photonics : development of fibre lasers, lidars, fibre Bragg gratings technology, advanced design for optical amplifiers and WDM sub-systems, monitoring systems for Passive Optical Networks.

. Networking : telephony IP, VoIP, secure inter-operator and inter-technology roaming solutions in wireless and mobile networks, traffic simulation and protocol emulation.



Multitel: a strong European involvement

Multitel is involved in 14 European projects. In 2002, at the first call of the 6th Framework programme of the European Commission, first success for Multitel, 6 projects proposed by the Centre were accepted !

A few weeks ago, at the fourth call of the 6th framework programme of the European commission: new success for Multitel, six other projects were accepted.

All those projects are dealing with the main areas of expertise of Multitel and concern various applications such as multimodal man/machine interfaces for transport or logistics, biosensors for medical issues, etc.

Richness of European partnership: an asset for the Walloon industry

The European projects in which Multitel is involved give an opportunity to work with many prestigious partners coming from various backgrounds : private companies, universities, Research Centre with all different goals and ways of considering challenges.

Multitel collaborates with...

Big international companies as THALES Communications S.A, Europaisches Microsoft Innovations Centre GmbH, ALCATEL, EADS, Skoda, IBM, France Telecom, Hewlett Packard, Telefonica, etc.

Universities as FPMs, UCL, the University of Bremen, the University of Bristol, Universitat politecnica de Catalunya, etc.

Research Centres as CNRS, INRIA, Institute Eureco, etc.

The different partners complement one another and the Multitel Engineers offer a strong awareness of industrial matters. It allows them to be at the leading edge of scientific innovations and progress.

Thanks to these fruitful partnerships, Multitel provides market-driven industries with scientific and technical support for developing, implementing and monitoring next generation technologies.

Multitel is also involved in national and regional projects.



Multitel forms and informs

Besides those services, Multitel organises seminars and conferences to keep companies updated on the scientific innovations and Multitel also delivers cutting-edge training to meet companies' needs and requirements.

Multitel is moving A larger building for an expanding activity

On 12th April 2005,

Elio di Rupo (at that time mayor of Mons, he is now the Minister President of the Walloon Region), laid the foundation stone of the new Multitel's building during a ceremony led by Serge Boucher, Rector of the "Faculté Polytechnique de Mons" and Chairman of Multitel.

Elio di Rupo's presence is a recognition of the Centre's importance and dynamism in the Walloon area.

7 months later...

Very close to the existing premises in Parc Initialis, the new Multitel building is still under construction.

Foundations, ground floor, first and second floors are over and the optics laboratory can be seen.

The building construction will be finished on the date initially set despite some but usual technical problems encountered during the construction.



Today, Multitel's 90 employees are split in two sites far away from one another (Parc Initialis and "Faculté Polytechnique de Mons"). By next February, they will be gathered in the new over 3000 square meters building, located on the first of the Pierre and Marie Curie street.

From this large space, new ambitions and recruitments should

Multitel: a Research Centre certified ISO 9001

In November 2004, Multitel, which has always been dedicated to provide high quality services, was granted the ISO 9001 Quality standard.

To obtain this worldwide certification, all the Multitel departments were audited by an independent daughter company of Bureau Veritas a leading provider of safety and reliability services specialising in classification, certification, verification and advisory services.

The ISO certification is based on a pass/fail system.

The requirements fulfilled for the standard by Multitel is the guarantee that from the inception and design to the completion of the finished system, the process followed by Multitel, considering the present state of art, is at of the highest quality possible. And every 6 months, Multitel has to prove that it still deserves its certification.

Quality being the cornerstone of Multitel philosophy, the most recent audit that took place one month ago was a success.



■ "Divines" for everybody

In the days of typewriters, typists dreamed of creating an automatic typewriter that could type anything on verbal command. For several decades, engineers and speech specialists have been working on computer and speech recognition to make that dream come true. Of course, improvements have been made since 1939, when the first electronic speech synthesizer called the Voder appeared.

In the 90's, several speech recognition products casted at text dictation appeared on the market. But, up to now, this technology remains imperfect and uneasy to use and research has to keep on going in order to get a convincing one. Improved technology will then find its way in consumer products like toys and games, or car navigation systems, as well as in professional cases where this technology will provide productivity benefits.

■ How does speech recognition work?

When you speak to a computer, your words are analysed by speech recognition algorithms and then broken down into sound bits. Then the computer associates these sound bits with elementary speech sounds, called phonemes. Those elementary sounds are then assembled to match words or even complete utterances. The best match is identified by the speech recognition search engine, based on complex models of speech sounds, words and phrase structure.

In theory the process seems quite simple but actually there are many cases where this process can fail and has to be improved. These cases are mostly related to the highly variable nature of the speech signal like foreign accents, speed, voice timber, gender, speaking style, vocal effort and to extrinsic variabilities like noise.

As a R&D Centre specialised in Speech Processing, Multitel, highly involved in the technology process is taking part, as the coordinator, on a European project called DIVINES.

In February 2004, this project started with a kick-off meeting in Mons, Belgium. For the following 36 months, Multitel is going to work with German, French, Italian partners with various domains of expertise, like speech technology, audiology, psycho-acoustics. The consortium gathers universities, research centres, as well as telecom operators and companies developing speech-enabled applications.



DIVINES project's main objective is to provide a better understanding of the failure modes and to find a way to deal with the variabilities to improve the reliability and accuracy of this technology in various difficult contexts.

Once the project achieved, children, foreigners, or anyone else shall be able to command and control a computer, a phone or a PDA by voice, even if the request is too fast or made with a strong accent, no need to repeat several times what you have just said, very helpful when one is driving and trying to find the right way.

■ Wcam: from video on demand...

We spend a lot of time waiting.
Waiting for our train, for our flight, waiting in a queue...
Waiting not doing anything but counting down the minutes and champing at the bit.
Time, which usually flies like, seems amazingly endless in those situations.
To fill it, hot spots have sprouted like mushrooms in public areas, like airports, restaurants, hotels...and we can browse the World Wide Web instead of while waiting aimless.

But if browsing on the World Wide Web in a public area on a PDA or a Pocket PC is a great innovation, watching a film might be more entertaining. The Wcam project intends to make it possible.

Multitel is one out of the ten partners of this European Wcam project co-ordinated by Thales.

A good quality video is not that easy to obtain. For a consumer watching the wanted video should be simple, just a click, but for the engineers it is much more tricky.

The system has hard constraints: the narrow transmission bandwidth of such a wireless channel prevents the sending of too much data and mobile devices have limited computing resources.

Wcam intends to exploit the most recent video compression algorithms.

Many other issues have to be addressed, for instance the robustness of the system whenever the communication is interrupted.

■ ... To video surveillance

But other applications less entertaining are possible. Video surveillance is one of them, security being a current worldwide concern. The technologies developed in the Wcam project by detecting abnormal or dangerous events in real time will give an opportunity to take the appropriate decisions and react faster.

An example: a camera is fixed above an area to be controlled, such as an airport. An automatic image analysis module processes the video sequence and detects in real-time abnormal events such as a suspicious abandoned luggage. The analysis module sends an audio alarm message to the security agent on its PDA. This agent security could watch the video sequence coming from the surveillance camera, in real-time on his PDA and will then be able to react and take a quick and appropriate decision.



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