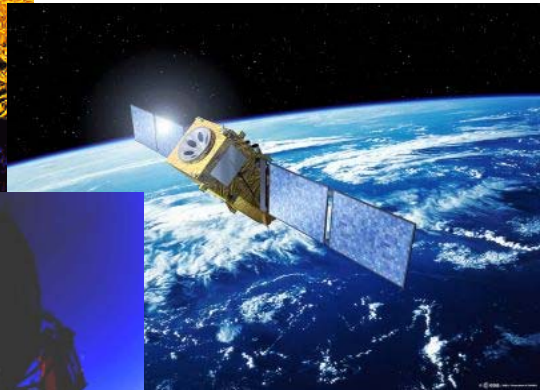
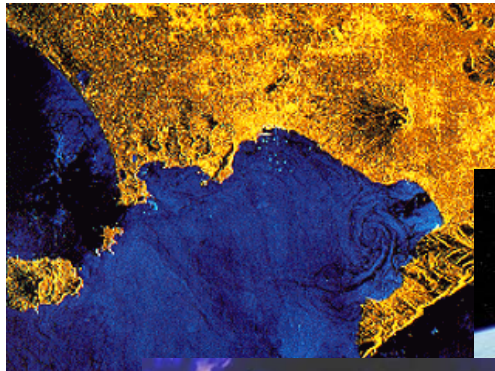




intecs *informatica e tecnologia del software*

Brainware Company



Space Division

Company Description

Intecs S.p.A is a Small Medium Enterprise, private company operating in the information technology field.

The 2007 company turnover shows a 20% of share in the Space market. About 250 employees located in Rome, Naples, Pisa, Milan, Turin and Toulouse.

More than 80% employees have a university degree, either in Computer Science, Engineering or other scientific disciplines.

In December **1994** Intecs passed the formal certification audit for **ISO 9001** and in 2003 for **VISION 2000** and in the 2005 the CMM level 3 has been achieved.

This places Intecs among the first Companies certified in Italy. The Certification applies for any software development project in the Civilian, Space, and Defence domains.

The business area of the Company is in the Information Technology field applied to the Transport, Telecommunication, Space and Defence Domains.

Intecs provides big national and international organizations with consultancy services on high-tech systems, as well as prototype, product and "turn-key" software systems developments.

On-Board Applications

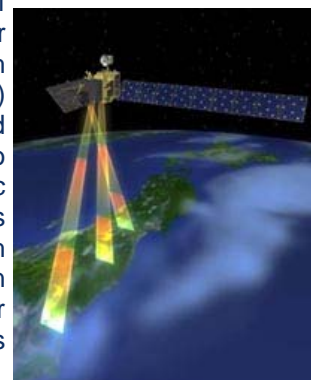
INTECS has acquired in-depth competencies in the development of On-Board Software Subsystems for different spacecraft missions and covering different aspects and technological issues. Such expertise spans over the following areas:

- Development of On-Board Software Subsystems, including Data Handling, platform services and payload management subsystems, as already provided in several major European projects
- Development of a navigation payload as a GPS/GALILEO Receiver based on SDR techniques for a small satellite (MIOSAT) funded by ASI
- Dependable Systems among which is worth to mention the "Fault Tolerant Computer Pool" for a GNC Avionics Test Bench, and the "Generic Upgradable Architecture for Real-time Dependable Systems" (GUARDS). Both projects refer to fault-tolerant system architectures with 2-to-4 fully redundant computers.
- Operating Systems and Basic Software

Ground Segment Infrastructure and Applications

Intecs has acquired several specific competencies in the development of SW environments supporting the Ground Systems of satellite missions. Such expertise spans over the following areas:

- Services to end users, including catalogue access, ordering support and products dissemination, among these it is worth to mention MUIS and the Interface Manager for the User Ground Segment of Cosmo Skymed.
- Datawarehouse system for the reports creation and delivery for the ESA user services.
- The SSE (Service Support Environment) is aimed at providing an opportunity for improving the market expansion and penetration of existing or prototyped Earth Observation (EO) products and services, also into the Geographic Information Systems (GIS) world, through an enabling, open environment for Service Providers and potential users.



- Interoperable architectures allowing users to interface different Data Providers with different catalogue systems, in a seamless service.
- Design and implementation of the satellite Data Dissemination System (DDS). The system provides for dissemination of EO large data sets (ERS, ENVISAT, etc.) all over Europe using Satellite/DVB links.

Environment and Territory

Intecs is active in the area of GIS and Image Processing standards, value added and thematic services, in order to provide local, regional and national end-users with support in **Agriculture, Urbanism, Civil Protection and Environment** areas.

Among these activities it is worth mentioning the **Kyoto Inv Service** for the Verification of the Land Use, Land Use Change and Forestry (LULUCF) activities as required by the Kyoto

Protocol. The Project, was developed in the framework of the DUP II Programme (ESRIN/ESA).

- Intecs is also Service Provider for the GSE-Forest Monitoring , funded by ESA under the GMES umbrella. Under this project Intecs is continuing the Kyoto-Inventory Service Provision for Italy and Switzerland.



During these projects more whole Italy and Switzerland have been mapped and for different processing years.

- Intecs has a participation to the “GEOGRAPHIKE” spin-off company, focusing on Remote Sensing, Territory Studies and WEB Cartography.

Software Engineering and Case Tools

Intecs has a deep expertise in the definition of methods and the development of supporting tools for the for different activities of the system and software development process.

In recent years, Intecs has developed a family of CASE products (HoodNICE, HRT-HoodNICE, UmlNICE and HRT-UML) to support design and analysis of object-oriented, critical, and HRT software.

Intecs is a leader in the software engineering community in the field of methods, languages and tools for the development of generic architectures and component oriented software reuse.

It has particular expertise in advanced domain analysis and design techniques for reusable architecture development, having co-developed with Hewlett- Packard Research the FODACom methodology for feature-oriented domain engineering of telecommunications systems.

Intecs supports its customers in the definition of methods, languages and tools to support system and software processes, based on the **UML**, **SysML** and others domain specific languages, in the application of model driven engineering approaches, and in the selection and customization of commercial and open-source CASE tools.

Intecs is also active in **education and training**, by providing seminars, courses and workshops on state-of-the-art subjects, including coding languages (Ada, C, C++), design methods and languages (HOOD, UML, HRT-UML, MDA, SysML) and space software standards (ECSS E40 and Q80).

Satellite Navigation Applications

Software Receiver Technology

Intecs has developed a set of GNSS (Global Navigation Satellite System) Receiver products based on **Software-Defined Radio (SDR)**. Its fully software terminals are capable of receiving GPS, EGNOS and the new GALILEO constellation.

The fully software approach allows producing smaller, lighter and less expensive receivers with a high level of configurability, which was not attainable with traditional hardware receivers. The resulting solutions are more flexible and hardware independent, so that the terminals can be deeply configured via software. For example, a GPS receiver can be converted to a GALILEO receiver by a simple software update.

Personal location applications

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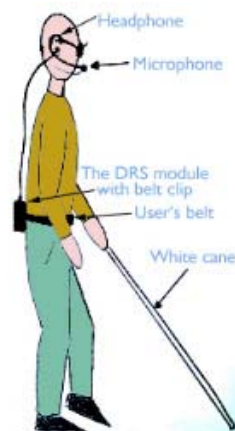
INTECS is currently developing a new user terminal for impaired people pedestrian mobility. The terminal can be used for other applications in the field of security and emergency management.

The system includes the utilization of the GPS and EGNOS receivers to precisely measure the blind position and provide him audio suggestion about the environment and the suggested path to reach a requested location. The project, funded by Italian Space Agency, is called POSSYBLI.

The terminal has unique features in the integration of GNSS data with Inertial Measurement Unit (IMU) device and with

wireless communication links to provide a “Best in Class” positioning service keeping advantage from all the available information.

Blind inputs the destination to which he/she wants to move and receives the information on the safest and shortest way by means of an head-phone.



Embedded software for GPS receivers

INTECS has been involved in the design and development of a specific embedded application

for a commercial navigation system. This application is mainly addressed to:

- the management of data produced by the GPS sensor in order to know where the boat is,
- command the auto-pilot in order to steer the boat to the destination,
- manage all the user inputs.

Railway applications

Intecs exploits its knowledge in assessing methods and procedures for the verification of software together with its experience in the navigation domain in order to increase train security.



In fact Intecs has realized a tool for Railway Navigation (named RUNE) developed for ESA that

should allow, in the next future, to increase security on trains without excessive cost burdens. The tool works by comparing and integrating the standard train positioning information with the GNSS Receiver positioning, thus guaranteeing a higher level of precision for the train position without excessive cost increase.

Products

A new Hard Real Time Operating System designed and developed by Intecs, compliant to the Osek/Vdx standard and suitable for the development of embedded Real-time Applications. Microsek is also certifiable against



Safety Critical Software International Standards.

HRT-UML, providing a comprehensive solution for the modelling of Hard Real Time Systems by replacing the HRT-HOOD method with a customised version of UML that incorporates all the advantages of the HRT-HOOD method and improves the HRT-HOOD Design Concepts by converging to a more powerful and expressive modelling notation, which is currently a de-facto international Standard.



Enarro is an exciting novel genre of tourist and visitor guides for the contemporary world traveler. Enarro exploits new multimedia and positioning technologies to deliver mobile audiovisual guides for smart phones and pocket PC's.

Soft-Rec

SOFTREC GPS/EGNOS is a Real-Time Software Receiver, initially developed for ESA-ESTEC, complete of a friendly GUI, whose acquisition, tracking and positioning core can be embedded in whichever system at reduced cost if compared to conventional technologies.

SOFTREC G is based on the same Real-Time SDR concept and applies to the new constellation GALILEO that will be operating in the near future. It is part of the GTR (Galileo Test Range) in Rome.



SOFTREC G3 is a tool designed for analysis purpose and is capable of performing a deep and detailed analysis of GALILEO signals in all its bands (E1-A, E1-BC, E5-A, E5-B, E5-AltBOC, E6-A, E6-BC). The tool has been developed within the LTS (Local Test Station) project of ESA-ESTEC for the IOV (In Orbit Validation) phase of GALILEO project.

References

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