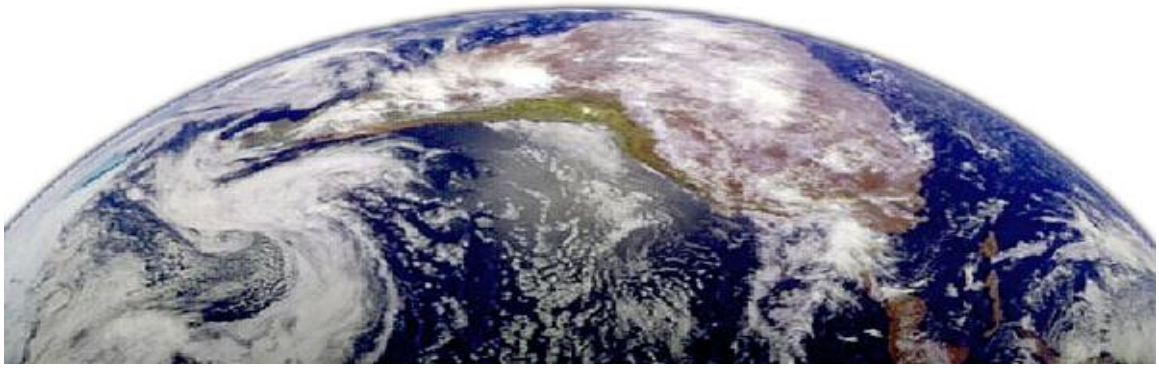
applied research solutions

Flyby



Company Presentation

July 2015

Contents

Company profile

Flyby is an independent Italian SME company, devoted to applied research and innovative technology development in remote sensing.
Interdisciplinary background and expertise in various fields allow Flyby to face complex challenges in applied research and to develop innovative products that bring a high added value to the many Institutional and Private customers.
The company is managed by the founder Dr. Emilio Simeone (Laurea in Physics, PhD in Applied Optics). The staff is composed by fifteen collaborators with MS and PhD level education and skills in Computer Science, Physics, Telecommunication, Electronics, Signal Processing Engineering and Artificial Intelligence.
The instruments, services and products developed by Flyby find their main applications in the following fields:

1. Defence & Security
2. Environmental monitoring and protection
3. Renewable energies
4. Tourism & Outdoor life quality

The company conducts two lines of business: the first is represented by the constant involvement in various R&D projects funded by the European Space Agency (ESA), the Italian Space Agency (ASI), the European Commission (EC) and by other regional agencies; the second line consists in selling the commercial products that derive from prototype applications developed in the former R&D projects.
Flyby's processes are managed according to UNI EN ISO9001:2008 quality standards. For the more demanding space projects are also applied the methods set down in the ECSS standards.

Certificate N. IT08/0741

The quality management system of

FLYBY SRL

Via Puini, 97 Int.26 - 57128 LIVORNO - Italy

has been assessed and certified as meeting the requirements of

ISO 9001 / UNI EN ISO 9001:2008

For the following activities

Design and development of data processing software and provision of related information services.

EA Sector: 34, 33

This certificate is valid from 31/07/2011 until 31/07/2014 and remains valid subject to satisfactory surveillance audits.
Re certification audit due before 23/07/2014.
Issue.3. Certified since 31/07/2008.

Further clarifications regarding the scope of this certificate and the applicability of ISO 9001:2008 requirements may be obtained by consulting the organization.

Authorized by
Stefano Bertoncini

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Page 1 of 1

ISO9001 certificate

Competences

For its services Flyby exploits state-of-the-art technologies like: satellite and airborne EO optical imagery (multi- and hyper-spectral), GIS and webGIS, GNSS positioning systems, in-situ sensors and instruments, terrestrial and satellite wireless communication links.

Above all, Flyby's cutting edge competence is the capability to develop dedicated algorithms for the processing of data, especially those coming from optical sensors, and the capability to model complex systems. Such capabilities stem from the multi-disciplinary background of Flyby's R&D personnel, who is active in both assimilating the latest achievements of scientific literature and in collaborating with important public and private research centers, thus achieving the goal of designing and implementing innovative algorithms tailored to any specific application.

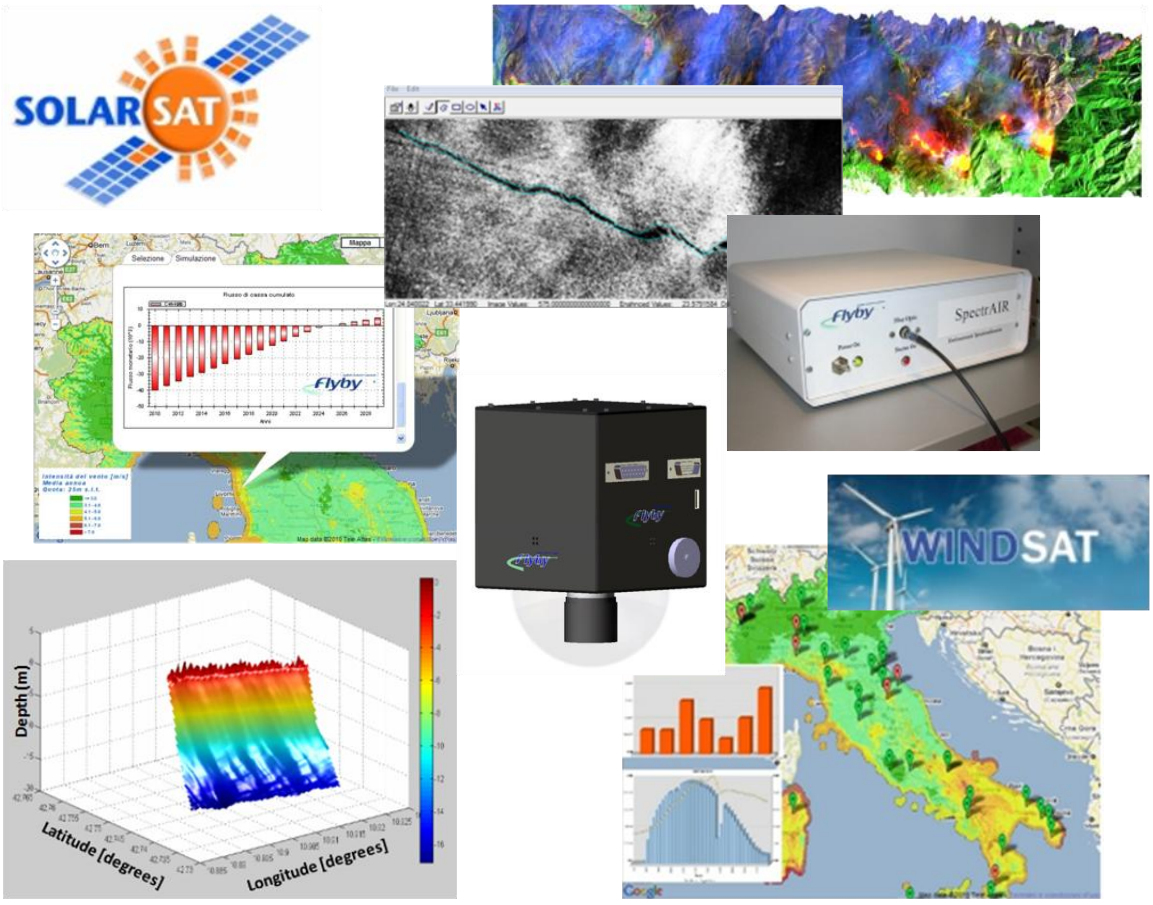
Here is a list of Flyby's technical competences:

- Artificial Intelligence techniques: decision support systems, neural network processors, fuzzy logic processors (e.g. target detection and pattern recognition)
- fusion of optical EO based environmental parameters with on-ground sensors measures or with SAR measures (e.g. pan-sharpening)
- modelling of solar light interaction with atmosphere/land/sea
- Bayesian analysis for classification of any substance/material properties
- development of SW in C#, C++, ANSI C, IDL/ENVI, ASP.NET, Java Script, etc.
- development of SW for embedded systems (WindRiver, Linux)
- processing of satellite and airborne multi-hyperspectral imagery
- Differential Optical Absorption Spectroscopy, FT-IR, Fluorescence, LIDAR
- satellite optical payload operations simulation (radiative transfer models, soil reflectances, optical calibration, ...)
- environmental measures by in-situ sensor networks and data collection by wireless links (e.g. GPRS mobile)
- information integration into GIS and webGIS system
- information provision via web and via mobile phone
- EO Mission analysis and design (orbital prediction and determination, ground visibility, EO sensors performances simulation, ...)
- capability to develop SW according to European space standards (e.g. PSS, ECSS), either as prime or as sub-contractor, thanks to decennial experience in previous space companies (see CVs in section *'Personnel'*)

Applications

Almost all Flyby applications make use of remotely sensed data. So far they have regarded:

- sea transparency, sea bathymetry
- forest fire detection
- ships detection
- land classification (fusion of spectral albedo in-situ measurement with hyperspectral satellite data)
- detection of anthropic marks within a natural environment
- marine oil spill detection
- marine water quality monitoring
- coastal erosion monitoring
- solar radiation monitoring (e.g. UV index, sunburn time, photovoltaic energy)
- photovoltaic plants design and cost assessment
- photovoltaic plants efficiency monitoring
- wind farms monitoring



Customers

Flyby has provided services and products based on optical remote sensing to many customers into different market sectors like Oil & Gas Corporates, Defence governmental bodies, Environmental agencies, Aerospace Corporates.

Aerospace Customers

ESA (European Space Agency)
Flyby has been involved in many projects funded by ESA, also as prime contractor. The typical aim of such projects is to setup valuable information products that exploit the many EO satellite data made available by ESA in order to satisfy the needs of important users (i.e. Corporates) who may benefit from the adoption of such products in their routine processes and may then decide to purchase them. All such projects have been completed successfully.

ASI (Italian Space Agency)
The last SW product delivered to ASI and installed in the Space Geodesy Center of Matera consisted in a stand-alone SW program, capable to process ESA and NASA EO satellite optical images, to detect and classify the oil slicks at sea, to report the detected slick features to the Italian Ministry of the Environment and to feed a separate SW section with data useful to forecast the slick behaviour. The oil slick detection reliability was validated by in-situ inspection performed by a boat.

Thales Alenia Space
Flyby is developing a prototype digital camera system for assisting UAV landing, including flight embedded SW for real-time image processing.

Alenia Aeronautica
Flyby has recently acquired a commission for the development of a SW suite for the simulation of an imaging hyperspectral sensor operating onboard of UAVs.

Selex Galileo
Flyby has recently acquired a commission for the development of SW processing related to remote sensing from space electro-optical payloads.

Defence Customers

The top-management staff has had a direct involvement in the Defence & Security field: Dr. Simeone was Officer in the Italian Navy Staff (Stato Maggiore) and Dr. Flore was in the Carabinieri Armed Force.

Other personnel competences in the Intelligence sector have allowed Flyby to establish relationships with the Navy, the Defence Staff (SMD - Stato Maggiore della Difesa – the Italian Interforce Central Command) and to become partner of the Italian Air Force Remote Sensing Department for the real-time acquisition and processing of MSG (Meteosat Second Generation) satellite data.

Italian Navy
Flyby has provided the Italian Navy with integrated remote sensing services in different maritime and coastal scenarios, like border security enforcement, maritime traffic surveillance, identification of dangerous events or illegal activities potentially harmful for the safety of citizens and for the environment.

Italian Coast Guard
Among the many supplied systems, Flyby is particularly glad to have included the new Remote Sensing Laboratory, installed at the Naval Academy in Leghorn, consisting of HW and SW facilities for the processing of airborne multispectral and IR imagery, for security and environmental applications.

Environment and Tourism customers

Flyby offers sea water quality products based on satellite EO data which may be procured either from archive or obtained right after acquisition, thanks to data access agreements established with space agencies. Example of customers of such products are: ENI S.p.a, for the purpose of monitoring the impact of off-shore extractive platforms on marine biodiversity; Lega Ambiente, for the purpose of monitoring the cleanness of popular beaches; French Coast Guard, for the purpose of assessing the status of harbour waters.

Flyby has provided its 'SpectrAIR' (an UV-VIS-NIR spectro-radiometer) to Italian Environment Protection Agencies (ARPA) for the purpose of collecting soil albedo, total column ozone, photo-synthetic active radiation, etc.

Flyby has provided its UV photoprotection service 'HappySun' to Regional ARPAs, to tourism institutions and to Skin Cancer Institutes, with the purpose of helping the tourists and the outdoor workers to avoid the skin damages due to UV solar radiation.

Renewable energies customers

Under the 'SolarSAT' brand, Flyby is marketing two products dedicated to renewable energy plants: one called 'Planner', for the plant design and cost estimation, the other called 'Controller' for the monitoring of the plant working efficiency. The 'Planner' product is fully developed for photovoltaic, thermal and wind plants, while the 'Controller Products' is fully developed only for the first plant type and under development for the other two (www.solarsat.eu) .

Under the 'WindSAT' brand Flyby produces and sells "WindMicroTower', a wind measuring tower capable to perform wind measurement campaigns to assess the amount of wind energy available in a specific location. The tower is completely autonomous as it is self-powered and stores every data into a local memory. Remote monitoring can be done, provided that GPRS signal is present: in this case the tower automatically transmits the acquired data to the central Flyby station: here data are processed and shown to customers via a dedicated web portal.

Customers of both SolarSAT and WindSAT products are big energy Corporates, like Enel S.p.A., and other rather big companies like PowerOne, Answer Drives, Martifer Solar, Global Power Services, Solon, Saime, etc.

Summary of Flyby's main institutional customers

- Hydrographic Institute of the Italian Navy (IIMM)
- NATO Undersea Research Center (NURC)
- Italian Coast Guard
- Italian Ministry of Environment, Land and Sea (MATTN)
- Lombardia Region
- Regional Agency for Environmental Protection of Tuscany (ARPAT)
- Regional Agency for Environmental Protection of Sicily
- Versilia Tourism Agency (APT Versilia)
- Bastia Chamber of Commerce (Corsica)
- National Cancer Institute (Naples)

Summary of Flyby's main industrial customers

- Thales Alenia Space S.p.A.
- Alenia Aeronautica S.p.A.
- Selex Galileo S.p.A.
- Telespazio S.p.A.
- Eni S.p.A.
- Enel S.p.A.
- Answer Drives S.r.l.
- Martifer Solar S.r.l.
- Global Power Service S.p.A.
- Solon S.p.A.
- Saime S.r.l.
- AFCON Software and Electronics Ltd.

Partners

Flyby's main industrial partners

- Telespazio – FINMECCANICA (Italy)
  Integrated EO and telecommunication satellite services
- Selex Galileo - FINMECCANICA (Italy)
- *Advanced Electro-Optical remote sensing solutions*
- ESRI Italia S.p.A. (Italy)
  Geographic Information Systems – GIS
- Nowcasting International Ltd. (Ireland)
  Weather forecast
- SatOC - Satellite Oceanographic Consultants Ltd. (U.K.)
  Satellite remote sensing of marine environment
- AFCON Software and Electronics Ltd. (Israel)
  Industrial automation software
- ERM - Environmental Resources Management (Italy)
  Environmental consulting services provider

Flyby's main scientific partners

- INOA - National Institute of Applied Optics (Italy)
  Complex optics systems design
- CNR/IFAC - Institute of Applied Physics "N. Carrara" (Italy)
  Remote sensing and optical environmental systems
- DLR - German Aerospace Center (Germany)
  Design and manufacturing of space systems
- ParisTech (France)
  Design and of data fusion SW
- Federico II University of Naples - Dermatology Clinic (Italy)
  Dermatological diagnostics and UV damage prevention
- CNR - Institute of Biophysics (Italy)
  Environmental photobiology
- CNR - Institute of Biometeorology (Italy)
  Biometeorology and environment
- NURC - NATO Undersea Research Center (Italy)
  Marine remote sensing
- Information Engineering Department of the University of Pisa (Italy)
  Data processing
- KNMI - Royal Netherlands Meteorological Institute (Netherlands)
  Assimilation and classification of satellite data

R&D projects

A list of the main R&D projects based on satellite remote sensing.

Project	Description	Customer	Prime
AURORA	2016-2019 – Advanced Ultraviolet Radiation and Ozone Retrieval for Applications User: Pierre Fabre Italia S.p.a.	EU (H2020)	CNR – IFAC (I)
i-FISHSAT	2015-2017- IAP demonstration project:Integrated Satellite Services for Fishing Support and Safety	ESA	Avanti Comm. (UK)
SLOPE	2014-2017 - Integrated proceSsing and controL systems fOr sustainable forest Production in mountain arEas	EU (FP7)	Graphitech
SATENERG	2012-2014 – satellite based planning and monitoring services for Concentrating Solar Power plants, Concentrating Photovoltaic plants, offshore wind plants User: Enel Green Power	ASI	Flyby
FISHSAT	2011-2013 – integrated technologies and services for sustainable fishing	ESA	Flyby
ENDORSE	2011-2013 – Energy Downstream Services – planning and monitoring services for Concentrating Solar Power plants User: Enel Green Power	EU (FP7)	ARMINES (F)
CTOTUS	2010-2012 - Remote sensing imaging advanced processing techniques development	Selex-Galileo	CNR-IFAC (I)
DATAMARE	2009-2011 - Development of an UAV compact electro-optical payload for oil spills detection	EU/Tuscany Region	Flyby
SATOUR	2009-2011 - Information services for tourism based on EO satellite (optical & SAR) User: Alpitour World S.p.A.	ESA	Flyby
ALTRO	2011-2012 – R&D study for a compact Fluorescence Lidar avionic development system for oil spill detection from UAVs	EU/Tuscany Region	Flyby
MACC	2008-2011 – Monitoring Atmosphere Composition and Climate - Service chain validation for downstream test cases	EU (FP7)	ECMWF (UK)
LIMES	2007-2010 - Remote sensing data fusion of satellite and airborne optical sensors for maritime security User: Italian Coast Guard	EU (FP6)	Telespazio (I)
PRIMI	2007-2010 - Oil spill detection service based on satellite optical images User: Italian Ministry of Environment - Maritime Environment Protection.	ASI	Telespazio (I)

PROMOTE/ MEDSUN	2005-2009 - Public service delivering UV index, sunburn time, via web and SMS, based on optical EO satellites. Users: Regional Agencies for Environment Protection (ARPAs), National Institute for Occupational Safety and Prevention (ISPESL)	ESA	KNMI (NL) DLR (D)
WINDYGRID	2009 - Sitting and management of mini wind plants.	EU/Tuscany Region	Flyby
BIOSHORE	2006-2008 - Sea monitoring service for off-shore oil&gas extraction platform impact assessment, based on EO satellite data. User: ENI Extraction&Production S.p.A.	ESA	Flyby
EOREA	2007-2008 - Rapid Environmental Assessment based on EO data, focused on coastal environment. Users: Italian Navy, NATO Undersea Research Center	ESA	SOS (UK)
ENVISOLAR	2007 - Management of distributed solar PV plant connected on-grid, exploiting satellite EO data . User: ENEL S.p.A.	ESA	DLR (D)
SEALINE	2006 - Harbour water quality assessment for Corsica, using archived satellite optical images User: French Coast Guard	ESA	Flyby
ROSES	2005 - Oil spill real-time monitoring for Italian waters, based on satellite optical images specifically acquired. User: Italian Ministry of Environment - Maritime Environment Protection.	ESA	Telespazio (I)
HSM	2005 - Public service delivering UV index and sunburn time via web and SMS, based on satellite optical images. User: private beach resorts.	ESA	Flyby
STRIM	2004 - Detection of pollutant hydrocarbons in marine environment by means of optical satellite remote sensing.	ASI	Telespazio (I)