

PERSONAL INFORMATION

Fabio Michele Rana



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Sex Male | Date of birth 01/05/1974 | Nationality Italian

PREFERRED JOB

Research and Development in the field of Remote Sensing / Earth Observation. Synthetic Aperture Radar (SAR) specialist.

WORK EXPERIENCE

March 2022 – May 2022

Contract professor for the class of "Radar Signal Processing" (6 ECTAS)

Polytechnic of Bari, Via Amendola 126/B, 70126, Bari, Italy, <http://www.poliba.it>

Master Degree in "Ingegneria delle Telecomunicazioni", Dipartimento di Ingegneria Elettrica e Informazione (DEI), A.A. 2021-2022 (D.M. 270).

Business or sector Remote Sensing / Earth Observation by means of Synthetic Aperture Radar (SAR) systems

July 2011 → Present
October 2010 – March 2011

Researcher / Research Fellow

National Research Council of Italy (CNR)

Istituto sull'Inquinamento Atmosferico (IIA), at the Department 'Interateneo di Fisica - M. Merlin', Via G. Amendola, 173, 70126, Bari, Italy, <http://www.iiia.cnr.it> and the Institute of Intelligent Systems for Automation (ISSIA), Via G. Amendola, 122/D, 70126, Bari, Italy, <http://www.issia.cnr.it>

Main research activities:

- Design and development of the algorithm *SARWATER for Water Bodies and Hydroperiod extraction by means of high resolution SAR data (e.g., COSMO-SkyMed)*, within the national project *M.I.A. RETE-NATURA2000 - Monitoraggi Innovativi Ambientali RETENATURA 2000* (“*Monitoraggio degli Habitat 3170* Stagni temporanei mediterranei e 3150 Laghi eutrofici naturali con vegetazione del Magnopotamion o Hydrocharition*”), funded by Regione Puglia.
- Design and development of *Blind Source Separation (BSS) and Direction Of Arrival (DOA) algorithms*, within the project *TESLA VISION*.
- Design and development of the algorithm *SARCOAST for Shoreline extraction by means of high resolution SAR data (e.g., COSMO-SkyMed)*, within the national project *TECH4YOU (Technologies for climate change adaptation and quality of life improvement)*, PNRR Ecosistemi dell’Innovazione e *Restore4cs (Modelling RESTORation of wEtlands for Carbon pathways Climate Change mitigation and adaptation ecosystem services and biodiversity Cobenefits)*.
- Development and improvement of the algorithm *SARWIND LG-Mod* for high resolution sea surface wind retrieval (off-shore and coastal) by exploiting new generation SAR data (e.g., Sentinel-1), within the projects *ECOPOTENTIAL (Improving future ecosystem benefits through Earth Observations)*, *GEOEssential (Essential Variables workflows for resource efficiency and environmental management (ERA-PLANET Strand 2))* and *ESHAPE (EuroGEO Showcases Applications Powered by Europe)*.
- Design and development of algorithms aimed to retrieve high spatial resolution sea surface wind fields from satellite C- and X-band SAR data (*SARWIND LG-Mod*), in the framework of the project *RITMARE (‘Ricerca Italiana per il MARE’)*, funded by CNR (National Research Council of Italy).
- Development of innovative SAR interferometric multi-frequency techniques (*MCA, Multi-Chromatic Analysis*) mainly devoted to infer absolute phase and height measurements on the ground, in the framework of the *WiMCA* project (ESA contract 21319/07/NL/HE ‘*A novel approach for Wide-Band SAR Interferometry*’) extension, funded by the European Space Agency (ESA).
- Development of algorithms for multi-temporal and multi-frequency analyses of X-band interferometric SAR data, in the framework of the research program ‘*Valutazione dei dati COSMO-SkyMed in applicazioni di radar-interferometria multi-temporale e multi-cromatica*’, funded by the Italian Space Agency (ASI).
- Implementation of an interferometric SAR multi-temporal procedure for detection and analysis of Permanent Scatterers, in the framework of the contract between the ISSIA-CNR and the Department ‘*Interateneo di Fisica - M. Merlin*’ of Bari.

Business or sector Scientific Research / Software Design

June 2011 – July 2011
June 2008 – August 2010

Contract Researcher (at Department ‘*Interateneo di Fisica - M. Merlin*’)

Department ‘*Interateneo di Fisica - M. Merlin*’ of Bari and Polytechnic of Bari, Via G. Amendola, 173, 70126, Bari, Italy; Polytechnic of Bari, Via E. Orabona, 4, 70126, Bari, Italy; Geophysical Application Processing - GAP S.r.l., Via Amendola 173, 70126, Bari, Italy, <http://www.gapsrl.eu>

Main research activities:

- Design and development (in Matlab environment and for Windows platform) of algorithms for 'IfSAR-based' geo-referencing to be used as backup to the navigation of a vehicle without a human pilot aboard (UAV/missile) in the case of errors/disturbs to the IMU/GPS system, in the framework of the project *SARINA* ('SAR-based Augmented Integrity Navigation Architecture'), funded by the European Defence Agency (EDA).
- Design and development (in Matlab environment and for Linux platform) of algorithms to optimize InSAR integrated procedures, in the framework of the master course *TESTA* ('Tecnologie Satellitari per il Territorio e per l'Ambiente').
- Generation of deformation maps and detection of terrain slope instability by means of advanced SAR techniques based on satellite data exploitation: Definition of the test site in Daunia area and selection of X- and C-band SAR datasets; Research and development of algorithms for X-band data processing; Generation of the output deformation maps at both C- and X- band; Cross-comparison and validation of the output maps; Integration of maps in a GIS system. All activities were conducted in the framework of the research project '*FRANE PUGLIA*'.
- Research and development (in Matlab environment) regarding the processing of X-band SAR data, in the framework of the '*Test preliminare di elaborazione di coppie interferometriche acquisite dalla costellazione COSMO-SkyMed*'.
- Research and development (in Matlab environment) of procedures to obtain new geocoded products, starting from actual SAR geocoding algorithms.
- Software development (in Matlab environment and for Linux platform) aimed at updating the InSAR chain SPINUA, used by the Remote Sensing group at the Department '*Interateneo di Fisica - M. Merlin*' of Bari, and – in particular – the SAR geocoding algorithms of the processing chain, in the framework of the project '*MORFEO (MONitoraggio e Rischio da Frana mediante dati EO) - Protezione Civile dalle frane*'.
- Design and development (in Matlab environment) of algorithms – based on advanced techniques for SAR geocoding – for high-precision PSC (Persistent Scatterer Candidates) localization, in the framework of the contract between the ISSIA-CNR of Bari and the '*Autorità di Bacino*' of the Puglia region.
- Review of methodologies for high-precision SAR forward and inverse geocoding.

Business or sector Scientific Research / Software Design

December 2006 – August 2007

IT Consultant (at EDS - Electronic Data Systems - Italia S.p.A., Bitritto (BA), Italy)

Mediatica S.p.A., Via Silvio D'Amico 40, 00145, Rome, Italy

Monitoring of any anomalies or criticalness in the flow of data relating to managed servers and networks, and restoration of proper functionalities of systems by using dedicated software.

Business or sector IT Architectures, systems and services

EDUCATION AND TRAINING

January 2013 – December 2015

Ph.D. in Electrical And Information Engineering - Thesis Title: '*Exploitation of Satellite Synthetic Aperture Radar Data for Geophysical Parameters Retrieval over Land and Ocean*', 28th cycle - academic year 2012/2013 (date: 28/04/2016)

Polytechnic of Bari, Via Amendola 126/B, 70126, Bari, Italy, <http://www.poliba.it>

Main topics of the doctoral research:

1. MCA (*Multi-Chromatic Analysis*) technique mainly devoted to infer absolute phase and height measurements from a wide-band SAR interferometric pair.
2. Sea surface wind field retrieval by means of a single SAR image acquired off-shore or in marine coastal area (*SARWIND LG-Mod*).

- July 2015 **IEEE Geoscience and Remote Sensing Society 2015 Summer School (GR4S) on 'Data Fusion for Risk Mapping'**
University of Pavia (UniPV), Via Adolfo Ferrata 3, 27100, Pavia (PV), Italy
- Lecturers: F. Dell'Acqua (Associate Professor, UniPV), P. Gamba (Associate Professor, UniPV), A. Marinoni (Technician, UniPV), C. López-Martínez (Scientist, UPC - Universitat Politècnica de Catalunya, Barcelona, Spain), S. Atzori (Scientist, INGV - Geophysics and Volcanology National Institute, Rome, Italy), A. Taramelli (Associate Professor, IUSS University, Pavia, Italy), F. Zucca (Scientist, UniPV), F. Bovolo (Scientist, Fondazione Bruno Kessler - FBK, Trento, Italy), Vitor Silva (Global Earthquake Model - GEM Foundation).
- Main Topic: The exploitation of remotely sensed data from different sources for purposes of mapping risk and its components, i.e. hazard, vulnerability, exposure, in a geospatial environment.
- Laboratory: QGIS open-source tools and environment for geospatial information handling. Exercises.
- June 2012 **Course on 'Parallel Computing with MATLAB', delivered by MathWorks Training Services**
Institute of Intelligent Systems for Automation - National Research Council of Italy (ISSIA-CNR), Via G. Amendola, 122/D, 70126, Bari, Italy
- Topics and Labs: Working with a MATLAB pool; Speeding up computations; Task-parallel programming; Working with large data sets; Data-parallel programming; Increasing scale with multiple systems.
- September 2008 **International Summer School (attended as tutor) on 'Applications with the Newest Multi-Spectral Meteorological Satellites', sponsored by Consortium AUSI - Consorzio per la promozione delle Attività Universitarie del Sulcis-Iglesiente, EUMETSAT - European Organisation for the Exploitation of Meteorological Satellites and SSEC - Space Science and Engineering Center**
Consortium AUSI, Villa Bellavista, 09016, Monteponi, Iglesias (CI), Italy
- Lecturers: Paul Menzel (Senior Scientist, SSEC, University of Wisconsin, Madison); Verner Suomi (Professor, Atmospheric and Oceanic Sciences, University of Wisconsin, Madison); Paolo Antonelli (Scientist, Cooperative Institute for Meteorological Satellite Studies, University of Wisconsin, Madison).
- Topics: Radiation and the Radiative Transfer Equation; Spectral signatures from Earth's surface and atmosphere; High resolution sounding using infrared high resolution spectral data; Multi-spectral sensors for imaging RGB image combinations for cloud and severe weather studies; Instrument considerations and Cal/Val.
- Laboratory: Investigation of high spatial resolution visible and infrared data (from MODIS and SEVIRI) and high spectral resolution infrared data (from AIRS and IASI); Group work; Tests.
- January 2007 – June 2008 **University Master (1st level degree) in 'Tecnologie per il Telerilevamento Spaziale' - Thesis Title: 'Progettazione ed Implementazione di una Procedura per la Individuazione di Oggetti in Movimento con Andamento Lineare A Tratti in Algoritmi di Analisi Interferometriche SAR Multi-Temporalì' (date: 27/06/2008)**
University of Bari 'Aldo Moro', Piazza Umberto I, 70121, Bari, Italy, <http://www.uniba.it>

Theory: Earth Observation (EO) programs; Infra-Red (IR) and Microwave (MW) Remote Sensing; Remote Sensing by means of SAR systems; Orbitography; Reference Systems and Cartography; GPS Fundamentals; Probability and Statistics; Stochastic Processes; Segmentation and Classification of 'optical' images; Information Theory and Coding; Digital Signal Processing (DSP); Digital Image Processing (DIP); SAR Systems; SAR Interferometry (InSAR); Differential SAR Interferometry (DInSAR); Persistent Scatterers techniques.

Laboratory: Linux and bash scripting; MATLAB and its use for 'optical' and SAR image processing; IDL; DORIS interferometric tool and its use for SAR image processing; GIS Systems; Satellite Tool Kit (STK) software; ENVI and remote-sensed image processing.

Six-Month Training: Design and development of a procedure for the detection of targets on the ground characterised by piecewise linear movements to be integrated in multi-temporal interferometric SAR algorithms.

June 2007 **International Summer School (attended as student) on 'Applications with the Newest Multi-Spectral Meteorological Satellites'**

Mediterranean Agency for Remote Sensing and environmental control (MARSec), Via Perlingieri 1, 82100, Benevento, Italy

Lecturers: Paul Menzel (Senior Scientist, SSEC, University of Wisconsin, Madison); Kathy Strabala (Scientist, SSEC, University of Wisconsin, Madison), Liam Gumley (Scientist, SSEC, University of Wisconsin, Madison); Paolo Antonelli (Scientist, Cooperative Institute for Meteorological Satellite Studies, University of Wisconsin, Madison).

Topics: Radiation and the Radiative Transfer Equation; Spectral signatures from Earth's surface and atmosphere; High resolution sounding using infrared high resolution spectral data; Multi-spectral sensors for imaging; Instrument considerations and Cal/Val; Evolving to the Future Global Observing System.

Laboratory: Using HYDRA (a JAVA based freeware tool) to manipulate multi-spectral data; Staging, Viewing, Interrogating MODIS, AIRS, MSG Data; Group work; Tests; Final presentation.

June 2006 **Professional Engineer License, Member of 'Ordine degli Ingegneri della Provincia di Bari' (date: 20/06/2006)**

Polytechnic of Bari, Via Amendola 126/B, 70126, Bari, Italy

September 1993 – March 2006 **Laurea Degree in Electrical And Information Engineering - Thesis Title: 'Geocoding di immagini SAR' (date: 20/03/2006)**

Polytechnic of Bari, Via Amendola 126/B, 70126, Bari, Italy, <http://www.poliba.it>

Subjects included: Mathematics, Geometry and Algebra, Physics, Chemistry, Computational Science, Mathematical Methods for Engineers, Information Technology, Information Systems, Operating Systems, Calculators, Telecommunication Networks, Systems Theory, Electrical Communications, Signal Processing, Digital Signal Processing, Electrical Network, Electronic Devices, Analog and Digital Electronics, Electrical Measurements, Electromagnetic Fields, Electromagnetic Compatibility, Antennas, Economics Fundamentals.

Thesis Topic: Design and implementation of an algorithm (C code in Linux environment) for high precision geocoding of focused SAR images.

Mark Grade: 103/110.

September 1988 – July 1993 **Certificate of Secondary Education**

Liceo Scientifico Statale 'Cassano delle Murge', Via Abbruzzese, 38, 70020, Bitetto (BA), Italy

Subjects included: Mathematics, Physics, Chemistry, Biology, Geography, Astronomy, Italian Language, Italian Literature, Latin Language, Latin Literature, History, Philosophy, English.

Mark Grade: 60/60.

PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	B2	B2	B2	B2

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
 Common European Framework of Reference for Languages (CEFR), [TheCERLevels](#)

Communication skills

- Excellent written communication skills acquired from writing technical reports and publications
- Confident and professional speaking abilities gained through my experience as speaker at a number of International workshops and conferences
- Excellent verbal communication skills derived from weekly English lessons

Organisational skills

- Strong organizational skills derived from the ability to manage my activities through wise planning (specific tasks), time optimization, detail orientation and prioritization as demonstrated in all projects I was involved

Job-related skills

- Skilled at working as a team member as well as independently
- Strong problem-solving and analytical skills; Great ability at interpreting data
- Skilled at working efficiently under pressure
- Self-motivated, hard-working individual

Computer skills

- Excellent knowledge of Operating Systems MS Windows, GNU/Linux, Apple MacOS
- Excellent knowledge of most MS Office and Apache OpenOffice applications
- 15 years of experience with MATLAB programming
- Good knowledge of programming languages FORTRAN, IDL, C/C++ and Python
- Good knowledge of software ENVI, BEST/NEST, SNAP, DORIS, ArcGIS/QGIS, DSAS, Anaconda

Technical skills

- 15 years of experience in the field of Earth Observation
- Research and Development in the field of Satellite Remote Sensing
- Synthetic Aperture Radar (SAR) specialist
- Knowledge of Spacecraft Systems

Other skills

- A genuine desire to achieve, excel and evolve
- Excellent common sense, judgment, and decision-making abilities

Hobbies

- Caving; Paragliding; Climbing; Trekking; Football; Listening to music; Watching movies; Reading books; Astronomy

Driving licence

- Class B, A

ADDITIONAL INFORMATION

National and International Projects

Project *M.I.A. RETE-NATURA2000 - Monitoraggi Innovativi Ambientali RETENATURA 2000*, POR Puglia 2014/2020 - Asse VI "Tutela dell'ambiente e promozione delle risorse naturali e culturali", from 24/08/2021 to 31/12/2023 (ongoing), Responsibilities of the Research Unit, Design and development of the algorithm SARWATER for Water Bodies and Hydroperiod extraction by means of high resolution SAR data, References: Attestato di Responsabilità e Partecipazione a progetti vari (prot. N. 227523/2023 del 20/07/2023), Ordine di Servizio (prot. N. 670/2022 del 23/02/2022).

Project *Restore4cs (Modelling RESTORation of wEtlands for Carbon pathways Climate Change mitigation and adaptation ecosystem services and biodiversity Cobenefits)*, Horizon Europe, from 01/01/2023 (ongoing), Participant of the Research Unit, Preliminary design and development of the algorithm SARCOAST for Shoreline extraction by means of high resolution X-band SAR data, References: Attestato di Responsabilità e Partecipazione a progetti vari (prot. N. 227523/2023 del 20/07/2023), Accordo di collaborazione IAC-IIA prot. N. 170440/2023 del 05/06/2023, <https://www.restore4cs.eu/>.

Project *TECH4YOU (Technologies for climate change adaptation and quality of life improvement)*, PNRR Ecosistemi dell'Innovazione, from 01/01/2023 (ongoing), Participant of the Research Unit, Preliminary design and development of the algorithm SARCOAST for Shoreline extraction by means of high resolution X-band SAR data, References: Ordine di Servizio (prot. N. 71543/2023 del 10/03/2023), Attestato di Responsabilità e Partecipazione a progetti vari (prot. N. 227523/2023 del 20/07/2023), <https://www.tech4youscarl.it/>.

Project *TESLA Vision*, EU (ESA InCubed), from 17/10/2022 (ongoing), Participant of the Research Unit, Preliminary design and development of Blind Source Separation (BSS) and Direction Of Arrival (DOA) algorithms, References: Attestato di Responsabilità e Partecipazione a progetti vari (prot. N. 227523/2023 del 20/07/2023).

Project *Rete Natura 2000 azioni di monitoraggio di habitat (*2250 *9210 *1120 *8330 *1170) e specie (Stipa austroitalica Charadrius alexandrinus Larus audouinii) della Regione Puglia*, POR Puglia 2014/2020 - Azione 6.5 - 6.5.a. Procedura negoziale per la selezione di Azioni di monitoraggio di Rete Natura 2000 su habitat e specie della Puglia (D.G.R. 150/2020 e d.d. n. 108 del 06.08.2020), from 24/08/2021 (ongoing), Participant of the Research Unit, Preliminary design and development of the algorithm SARCOAST for Shoreline extraction by means of high resolution X-band SAR data, References: Attestato di Responsabilità e Partecipazione a progetti vari (prot. N. 227523/2023 del 20/07/2023), Convenzione UNIBA n. prot. 0000023 del 12/01/2022.

Project *NewLife4DryLands (Remote sensing oriented nature based solutions towards a NEW LIFE FOR DRYLANDS)*, LIFE20 PRE/IT/000007, from 01/01/2021 (ongoing), Participant of the Research Unit, Identification of index/sub-indicators from satellite data (Deliverable A2.1) for the two Italian sites, References: Attestato di Responsabilità e Partecipazione a progetti vari (prot. N. 227523/2023 del 20/07/2023), <https://www.newlife4drylands.eu/>.

Project *OT4CLIMA (Tecnologie OT innovative per lo studio degli impatti del cambiamento climatico sull'ambiente)*, MIUR, Programma PON "Ricerca e Innovazione 2014 e 2020, Avviso per la presentazione di progetti di ricerca industriale e sviluppo sperimentale nelle 12 aree di specializzazione individuate dal PNR 2015-2020 – Area di Specializzazione "Aerospazio", from 01/02/2021 to 28/02/2022, Participant of the Research Unit, Analysis of results on the two sites: Alta Murgia, exposed to land degradation; coastal area of Bari, exposed to flooding risk, References: Attestazione di servizio (prot. N. 2130/2021 del 15/06/2021), Ordine di Servizio (prot. N. 677/2021 del 01/03/2021), Attestato di Responsabilità e Partecipazione a progetti vari (prot. N. 227523/2023 del 20/07/2023), <http://www.iia.cnr.it/project/ot4-clima/>.

Project *ESHAPE (EuroGEO Showcases Applications Powered by Europe)*, H2020-SC5-2018-2, from 01/05/2019 to 30/04/2023, Participant of the Research Unit, Implementation of the workflow SARWIND_MS_LG-Mod available at the web page <https://vlab.geodab.org/>, References: Attestato di Responsabilità e Partecipazione a progetti vari (prot. N. 227523/2023 del 20/07/2023), Attestazione di Servizio (prot. N. 2132/2021 del 15/06/2021), Ordine di Servizio (prot. N. 3758/2020 del 23/11/2020), <https://e-shape.eu/>.

Project *eLTER Plus (European longterm ecosystem critical zone and socioecological systems research infrastructure plus)*, HORIZON 2020 INFRAIA-01-2018-2019, from 01/02/2020 (ongoing), Participant of the Research Unit, Collection of data and information useful to the “Alta Murgia” (Italia) site to be a new LTER site, References: Attestato di Responsabilità e Partecipazione a progetti vari (prot. N. 227523/2023 del 20/07/2023), <https://elter-ri.eu/elter-plus>.

Project *COHECO (Sistema Integrato di Monitoraggio Allerta e Prevenzione dello stato di COservazione di Habitat ed ECosistemi in aree interne e costiere protette e da proteggere)*, POR Puglia FESR-FSE 2014-2020 Bando "Innonetwork", from 02/01/2019 to 28/02/2021, Participant of the Research Unit, Design and development of a pre-processing and processing chain for detection and classification of the LC “Grassland”, References: Attestazione di servizio (prot. N. 2128/2021 del 15/06/2021), Ordine di Servizio (prot. N. 1615/2019 del 28/05/2019), Attestato di Responsabilità e Partecipazione a progetti vari (prot. N. 227523/2023 del 20/07/2023), www.coheco.it.

Project *GEOEssential (Essential Variables workflows for resource efficiency and environmental management (ERA-PLANET Strand 2))*, H2020-SC5-15-2015 “Strengthening the European Research Area in the domain of Earth Observation”. Tipo di azione: ERANET-Cofund Grant, from 01/09/2017 to 31/08/2021, Participant of the Research Unit, Exploitation of remote sensing data for the extraction of Essential Variables (EVs), such as the high resolution sea surface wind (SSW) in marine coastal areas, References: Attestato di Responsabilità e Partecipazione a progetti vari (prot. N. 227523/2023 del 20/07/2023), Attestazione di Servizio (prot. N. 2131/2021 del 15/06/2021), <http://www.geoessential.eu/>.

Project *ECOPOTENTIAL (Improving future ecosystem benefits through Earth Observations)*, European Union’s Horizon2020 research and innovation programme, from 01/09/2017 to 31/10/2019, Participant of the Research Unit, Monitoring of Natural Ecosystems by means of automate analysis of both satellite and in-situ data for the extraction of Essential Variables (EVs), such as the high resolution sea surface wind (SSW) in marine coastal areas, References: Attestato di Responsabilità e Partecipazione a progetti vari (prot. N. 227523/2023 del 20/07/2023), Attestazione di Servizio (prot. N. 2129/2021 del 15/06/2021), <http://www.ecopotential-project.eu/>.

Project *Apulia Space. Development Of Qualifying Technologies For Space, Earth And Human Beings*, MIUR, 2015, Participant of the Research Unit, Improvement of the algorithm *SARWIND LG-Mod*.

Project *RITMARE - The Italian Research For The Sea*, MIUR, since 2013 to 2016, Participant of the Research Unit, Design and development of algorithms aimed to retrieve high spatial resolution sea surface wind fields from satellite C- and X-band SAR data (*SARWIND LG-Mod*), References: Contratti: N. 4 proroghe dell’Assegno di Ricerca (Bando di selezione n. CNR ISSIA AR/BA/002/2011 - prot. 242 del 17/05/2011) a partire dalla data 15/01/2013 (Rinnovo Assegno - CNR ISSIA prot. 36 del 10/01/2013) su fondi del Progetto Bandiera RITMARE.

Project *WiMCA CCN 1 Project Extension (ESA contract No 21319/07/NL/HE “A novel approach for Wide-Band SAR Interferometry”)*, Agenzia Spaziale Italiana (ASI), since 2012 to 2014, Participant of the Research Unit, Development of innovative SAR interferometric multi-frequency techniques (*MCA, Multi-Chromatic Analysis*) mainly devoted to infer absolute phase and height measurements on the ground.

Project *Valutazione dei dati COSMO-SkyMed in applicazioni di radar-interferometria multi-temporale e multi-cromatica (Contratto I_047_09_0)*, Agenzia Spaziale Italiana (ASI), since 2011 to 2013, Participant of the Research Unit, Development of algorithms for multi-temporal and multi-frequency analyses of X-band interferometric SAR data, References: Assegno di Ricerca di 12 mesi (Bando di selezione n. CNR ISSIA AR/002/2011 - prot. 242 del 17/05/2011) a partire dalla data 15/07/2011 (Conferimento Assegno - CNR ISSIA prot. 306 del 11/07/2011) e N. 1 proroga di 6 mesi a partire dalla data 15/07/2012 (Rinnovo Assegno - CNR ISSIA prot. 459 del 17/07/2012).

Project *MORFEO - MONitoring And Landslide Risk By Using EO Data*, Agenzia Spaziale Italiana (ASI), from 11/11/2008 to 10/11/2009, Participant of the Research Unit, Software development (in Matlab environment and for Linux platform) aimed at updating the InSAR chain SPINUA, used by the Remote Sensing group at the Department ‘*Interateneo di Fisica - M. Merlin*’ of Bari, and – in particular – the SAR geocoding algorithms of the processing chain, References: Contratto di collaborazione coordinata e continuativa (6 mesi) e relativa proroga (6 mesi) stipulato con Politecnico di Bari - Dipartimento Interateneo di Fisica (C.F. 93051590722), dal 11/11/2008 al 10/11/2009.

Publications

Papers on Journals

- [8] Rana, F. M., & Adamo, M. (2022). Uncertainty Analysis in SAR Sea Surface Wind Speed Retrieval through C-Band Geophysical Model Functions Inversion. *Remote Sensing*, 14(7), 1685. DOI: <https://doi.org/10.3390/rs14071685>.
- [7] Richiardi, C., Blonda, P., Rana, F. M., Santoro, M., Tarantino, C., Vicario, S., & Adamo, M. (2021). A revised snow cover algorithm to improve discrimination between snow and clouds: a case study in Gran Paradiso National Park. *Remote Sensing*, 13(10), 1957. DOI: <https://doi.org/10.3390/rs13101957>.
- [6] Rana, F. M., & Adamo, M. (2021). Multi-scale LG-mod analysis for a more reliable SAR sea surface wind directions retrieval. *Remote Sensing*, 13(3), 410. <https://doi.org/10.3390/rs13030410>.
- [5] Rana, F. M., Adamo, M., Lucas, R., & Blonda, P. (2019). Sea surface wind retrieval in coastal areas by means of Sentinel-1 and numerical weather prediction model data. *Remote Sensing of Environment*, 225, 379-391. DOI: <https://doi.org/10.1016/j.rse.2019.03.019>.
- [4] Rana, F. M., Adamo, M., Pasquariello, G., De Carolis, G., & Morelli, S. (2016). LG-Mod: A modified local gradient (LG) method to retrieve SAR sea surface wind directions in marine coastal areas. *Journal of Sensors*, 2016. DOI: <https://doi.org/10.1155/2016/9565208>.
- [3] Adamo, M., Rana, F. M., De Carolis, G., & Pasquariello, G. (2014). Assessing the Bayesian inversion technique of C-band synthetic aperture radar data for the retrieval of wind fields in marine coastal areas. *Journal of Applied Remote Sensing*, 8(1), 083531. DOI: <https://doi.org/10.1117/1.JRS.8.083531>.
- [2] Bovenga, F., Derauw, D., Rana, F. M., Barbier, C., Refice, A., Veneziani, N., & Vitulli, R. (2014). Multi-chromatic analysis of SAR images for coherent target detection. *Remote Sensing*, 6(9), 8822-8843. DOI: <https://doi.org/10.3390/rs6098822>.
- [1] Bovenga, F., Rana, F. M., Refice, A., & Veneziani, N. (2014). Multichromatic analysis of satellite wideband SAR data. *IEEE Geoscience and Remote Sensing Letters*, 11(10), 1767-1771. DOI: <https://doi.org/10.1109/LGRS.2014.2308420>.

Conference Proceedings

- [15] Rana, F. M., Adamo, M., & Blonda, P. (2018, July). *LG-mod multi-scale approach for SAR sea surface wind directions retrieval*. In IGARSS 2018-2018 IEEE International Geoscience and Remote Sensing Symposium (pp. 3216-3219). IEEE. DOI: <https://doi.org/10.1109/IGARSS.2018.8518224>.
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