

# CURRICULUM VITAE

FORMATO EUROPEO / EUROPEAN FORMAT

## INFORMAZIONI PERSONALI/ PERSONAL INFORMATION

Nome, Cognome/Name, Surname

**Lovergine Francesco Paolo**

Indirizzo/Address

Via, numero civico, c.a.p., città, nazione/  
House number, street name, postcode,  
city, country

Telefono/Telephone

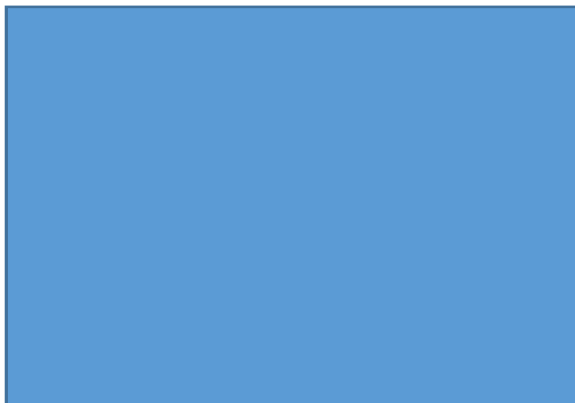
Fax

E-mail

Sito web/Website

Nazionalità/Nationality

Luogo e data di nascita/ Place and Date  
of birth



## ESPERIENZA PROFESSIONALE /WORK EXPERIENCE

Se dipendente CNR indicare:

**N. MATRICOLA 1901**  
**QUALIFICA RICERCATORE A TEMPO INDETERMINATO**  
**LIVELLO III**

In ordine di data /Dates (from – to)

1997-present

Nome e indirizzo del datore di lavoro /  
Name and address of employer

CNR – IREA (ISSIA until 2018)

Tipo o settore di attività / Type of  
business or sector

Research

Funzione o posto occupato / Occupation  
or position held

Researcher

Principali mansioni e responsabilità / Main  
activities and responsibilities

Research on remote sensing of environment

Se dipendente CNR indicare:

**N. MATRICOLA 1901**  
**QUALIFICA RICERCATORE A TEMPO DETERMINATO**  
**LIVELLO III**

In ordine di data /Dates (from – to)

1996-1997

Nome e indirizzo del datore di lavoro /  
Name and address of employer

CNR – IESI

Tipo o settore di attività / Type of  
business or sector

Research

Funzione o posto occupato / Occupation  
or position held

Researcher

**ISTRUZIONE E FORMAZIONE /  
EDUCATION AND TRAINING**

In ordine di data /Dates (from – to)	November 1993 – November 1995
Nome e tipo d'istituto di istruzione o formazione / Name and type of organisation providing education and training	CNR - IESI
Principali materie e competenze professionali apprese / Principal subjects occupational skills covered	Borsa di studio biennale CNR/MIUR per ricerche nel campo della Visione artificiale e Robotica.
Certificato o diploma ottenuto /Title of qualification awarded	Assegno di ricerca / Research grant
In ordine di data /Dates (from – to)	April 1992 - September 1992
Nome e tipo d'istituto di istruzione o formazione / Name and type of organisation providing education and training	CNR - IESI
Principali materie e competenze professionali apprese / Principal subjects occupational skills covered	Borsa di studio (Digital Equip. Italia) in ambito Robotica e navigazione autonoma in ambienti indoor complessi. / Scholarship (Digital Equip. Italia) in Robotics and autonomous navigation in indoor environments.
Certificato o diploma ottenuto /Title of qualification awarded	Assegno di ricerca / Research grant
In ordine di data /Dates (from – to)	November 1986 - December 1991
Nome e tipo d'istituto di istruzione o formazione / Name and type of organisation providing education and training	Università degli Studi di Bari / Bari University Corso di Scienze dell'Informazione / Computer Science degree course
Principali materie e competenze professionali apprese / Principal subjects occupational skills covered	Thesis: "Ricostruzione di superfici 3D da una sequenza di immagini spazio e tempo varianti" / "3D Surface Reconstruction by multi-spatial/temporal sequences of images"
Certificato o diploma ottenuto /Title of qualification awarded	Laurea in Scienze dell'Informazione (cum laude) / Degree in Computer Science (cum laude)

## ATTIVITA' DI RICERCA / RESEARCH ACTIVITIES

Attuali campi di ricerca / Research  
sectors

Parallel/distributed computing applied to computer vision; approximation and optimization methods; geospatial analysis in the domain of remote sensing; data analysis and wrangling; numerical methods. Main domain of applications: hazards and monitoring in the fields of environment, ecology and agriculture.

Recenti attività scientifiche/ Recent  
Scientific Activities.

### Participation to the following projects:

#### ● **ESA SEOM project – Exploitation of Sentinel-1 for Surface Soil Moisture Retrieval at High Resolution. Contract no. 4000118762/16/I-NB.**

- The scope of the two-year Exploit-S-1 project is to demonstrate the capabilities of the S-1 mission to support systematic SSM product generation at high resolution (e.g. 500m-1000m) and at regional/continental scale. A suite of SSM retrieval methods have been developed, implemented and validated using S-1 data. The methods are based on previous research into C-band soil moisture retrieval and been selected from the great wealth of approaches proposed in the literature and tailored to S-1 data. The emphasis is on implementing and comparing algorithms presenting the most promising trade-off among robustness, retrieval accuracy and potential matching with the requirements of different applications (e.g. Numerical Weather Prediction, hydrological forecasting, drought events ...) in terms of accuracy, resolution and product frequency. In addition, the suitability of the algorithm to fully exploit the S-1 observational assets (e.g., dual polarization, spatial/temporal resolution, radiometric accuracy) in order to deliver a large scale mapping have been considered. A key component of Exploit-S-1 is the validation activity that includes local and regional scale sites (e.g. the Mediterranean basin) in order to better assess the potential for pre-operational and operational soil moisture products and services. A further pivotal element of Exploit-S-1 is the assessment of the optimal pre-processing of S-1 time series for SSM retrieval.

#### ● **Denmark Fund for Innovation project: “MOIST – Managing and Optimizing Irrigation by Satellite Tools” 2017-2020**

- MOIST provides new, scientifically based satellite products to farmers in Denmark and abroad for intelligent irrigation management. The potential value of MOIST is high both in economic and environmental terms. The project will lead to increased crop yields, better management of water resources and reduced environmental impact of agricultural production. The unique contribution of MOIST results from a joint effort of agronomists, remote sensing scientists and IT architects working closely together to generate new knowledge and overcome the limitations of current technologies. MOIST includes remote sensing research, development of more precise irrigation strategies and the testing and dissemination to users in Denmark and elsewhere. In the advanced satellite products, a new approach to combine data from optical and radar sensors ensures timeliness and high-quality output. The output will directly benefit Danish farmers, and the export potential to other regions of the World is large.

#### ● **European Union (H2020) project: “EOMORES – Earth Observation-based Services for Monitoring and Reporting of Ecological Status”. Grant no. 730066 2016-2019**

- EOMORES aims to develop new highly efficient commercial services for operational inland and coastal ecological water quality monitoring. Inland and coastal water bodies constitute essential components of ecology and biodiversity, they buffer climate change and influence many aspects of economy (recreation, fisheries) and human welfare (e.g. drinking water supply). Knowledge about the state of these waters is therefore of great importance. This is recognized by the Water Framework Directive (WFD) requiring the EU member states to monitor and improve the status of these water bodies. EOMORES will develop fully-automated commercial, reliable and sustainable services based on the integration of Earth observation (Sentinel 1, 2 and 3), in situ monitoring using optical in situ sensors with integrated GNSS positioning, and ecological modeling. The validated data from these components will be flexibly combined into higher-level products to fit the users' information needs. Three service concepts are envisaged: 1) operational water quality monitoring and forecasting for operational water management, 2) implementation of validated EO-based water quality indicators for WFD and other reporting and 3) historic compilation of data for specific ecological analysis. The target users of EOMORES are international, national and regional authorities responsible for monitoring and management of water quality and for WFD reporting. Additional targeted users are private entities dealing with water quality. Thirteen users from six countries have committed to collaborate with the consortium to define and evaluate the EOMORES services. The services are expected to result in lower operational costs, more reliable and more timely water quality datasets for water managers

#### ● **European Union (H2020) project: “SensAGRI - Sentinels Synergy for Agriculture”. Grant no. 730074. 2016-2019**

- Combine Copernicus Sentinel-1 radar with Sentinel-2 optical and in-situ data, to develop new EO applications for the European agricultural sector / Develop prototype Copernicus services of SSM, green and brown LAI and seasonal crop type mapping and use those for proof-of-concept services of advanced agricultural monitoring products / Validate delivered

services and establish service demonstration cases to show the large application potential of the new upstream data products / Disseminate prototype and proof-of-concept services and interact services with the agricultural sector

● **European Union (H2020) project: “EcoPotential - Improving future ecosystem benefits through earth observations”**. grant no. 641762, 2015-2019

- The ECOPOTENTIAL project focuses its activities and pilot actions on a targeted set of internationally recognised protected areas (PA) in Europe, European Territories and beyond, including mountain, arid and semi-arid, and coastal and marine ecosystems. Building on the knowledge gained in individual PAs, the ECOPOTENTIAL project addresses cross-scale ecological interactions and landscape-ecosystem dynamics at regional to continental scales, using geostatistical methods and the emerging novel approaches in Macrosystems Ecology, which is addressing long-term and large-scale ecological challenges. ECOPOTENTIAL addresses the entire chain of ecosystem-related services, by (a) developing ecosystem data services, with special emphasis on Copernicus services; (b) implementing model output services to distribute the results of the modelling activities; and (c) estimating current and future ecosystem services and benefits, combining ecosystem functions (supply) with beneficiaries needs (demand). In ECOPOTENTIAL all data, model results and acquired knowledge are made available on common and open platforms, coherent with the Global Earth Observation System of Systems (GEOSS) data sharing principles and fully interoperable with the GEOSS Common Infrastructure (GCI).

● **European Union (7<sup>th</sup> Framework Programme) project: “BIO\_SOS – Biodiversity Multi-source Monitoring System: from Space to Species”**. grant no. 263435, 2010-2013

- BIO\_SOS (BIODiversity multi-SOURCE monitoring System: from Space TO Species) is a response to the Call for proposals FP7- SPACE-2010-1, addressing topic SPACE.2010.1.1-04 "Stimulating the development of GMES services in specific areas" with application to (B) BIODIVERSITY. BIO\_SOS is a pilot project for effective and timely multi-annual monitoring of NATURA 2000 sites and their surrounding in support to management decisions in sample areas, mainly in Mediterranean regions and for the reporting on status and trends according to National and EU obligations. The aim of BIO\_SOS is two-fold: 1) the development and validation of a prototype multi-modular system to provide a reliable long term biodiversity monitoring service at high to very high-spatial resolution; 2) to embed monitoring information (changes) in innovative ecological (environmental) modelling for Natura 2000 site management. The system will be developed and validated within ecologically sensitive 'sampling' sites and their borders exposed to combined human-induced pressures. Different environmental characteristics of the selected sites have been considered in order to ensure system robustness. Sites characteristics ranges from mountain rough to flat coastal morphologies, from rangeland to human dominated landscapes and land uses. BIO\_SOS intends to deeply investigate issues related to very high spatial (VHR) (and spectral) resolution Earth Observation data (EO) image processing for automatic land cover maps updating and change detection. Such maps are at the base of biodiversity indicators provision. On the other hand, it intends to develop a modelling framework to combine multi-scale (high to very high resolution) EO data and in-situ/ancillary data to provide indicators and their trends. This means the development of more appropriate and accurate models in support to a deeper understanding, assessment and prediction of the impacts that human induced pressures may have on biodiversity loss.

● **European Union (5<sup>th</sup> Framework Programme) project: “LEWIS – Landslide Early-Warning Integrated System”**. EU Contract N. EVG1-CT-2001-00055, P.I. Prof L. Guerriero, University of Bari, 2002-2005.

- Definition of cartographic products for the monitoring of millimetric displacements of the Earth surface through SAR data. Processing of multitemporal InSAR data for the monitoring of stable targets on the ground. Development of a software suite for multitemporal SAR data processing (SPINUA, Stable Point Interferometry over Unurbanized Areas). Production of landslide hazard maps over several active landslide test sites in Europe.

- **Italian Regione Puglia CLUSTER project “TAKE OFF – Test and Knowledge-based Environment for Operations, Flight and Facility”.** DTA Regione Puglia, 2016-2018.
  - R&D of an innovative system for acquisition, processing and presentation of data/results of test flights of GA and UAV based on data fusion techniques in cloud environments.
- **Italian Ministry of Education & Research PON project, “Apulia Space”.** Cod. PON03PE\_00067\_6, DTA Regione Puglia, 2014-2017.
  - The project deals with a wide spectrum of space-related themes, from space exploration to Earth observation, through acquisition and management systems for remotely sensed data, including social dissemination to foster the use of space data systems by governmental administration users.
- **Italian Ministry of Education & Research PON project, “RPASinAir”.** Cod. ARS01\_00820, 2018-2021.
  - The project aims at the development of new solutions in the aerospace and ICT fields, to foster an innovative monitoring and control system for the environment, integrating data from RPAS operating in the non-segregated air space, equipped with innovative sensors, with ancillary data, processed both in real and delayed time, with advanced analysis techniques implemented in cloud environments (RECAS research infrastructure), towards risk mitigation and prevention.
- **Italian Ministry of Education & Research PON project, “CLOSE 2 Earth”.** Cod. ARS01\_00141, 2019-2021.
  - The project aims at the development of a prototype propulsion system innovative concept (RAM-EP), which allows to use gases in the atmosphere as a propellant, thus with no limitations connected to its storage onboard. This could allow increasing consistently the operational life of a space vehicle in very low orbit (below 250 km, VLEO). The project also explores potential applications and services for sensors onboard VLEO spacecraft.
- **Italian Ministry of Education & Research PON project, “OT4CLIMA”.** Cod. ARS01\_00405, 2019-2021.
  - The project is aimed at the development of new instruments and methods for Earth observation to improve our knowledge and mitigation capacities for climate change at regional and sub-regional scale. Medium-long term impacts (e.g. vegetation stresses, droughts) as well as extreme events with rapid evolution dynamics (e.g. strong meteo phenomena, fires) will be studied, attempting both a product and process technological innovation pathway through a) the design and realization of advanced sensors for multi-platform EO systems; b) development of original methods for the analysis, interpretation, integration and fusion of EO data.

#### ULTERIORI INFORMAZIONI / ADDITIONAL INFORMATION

- **June 1992 - Qualificato nella assegnazione di una borsa di studio della durata di 30 mesi nell'ambito del Programma Nazionale di Ricerca sulle Tecnologie per la Bioelettronica nell'area “Elettronica Neuronale e Submicronica/Architetture e circuiti neuronali al silicio per sensori e sistemi di apprendimento” - SGS-Thomson Microelectronics. S.r.l. / Qualified for a 30 months industrial scholarship PNR/SGS-Thomson Microelectronics.**
- **Certified SUN Solaris 7 System and Network Administrator**
- **FOSS activist and contributor of the main open source GIS projects**
- **2000 – current**  
**Official member (Debian Developer) of the Debian GNU/Linux Operating System. See more information at <https://qa.debian.org/developer.php?login=frankie@debian.org>**
- **2005 – current**  
**Project manager of the DebianGIS project and blend. See more information at <https://wiki.debian.org/DebianGis>**
- **2018 – current**
  - **Responsabile informatico sezione di Bari del CNR-IREA**
  - **Punto Istruttore per il sistema di e-procurement (MEPA/Acquistinrete) per CNR-IREA**

Peer-reviewed journals:

- M. Zingaro, A. Refice, E. Giachetta, A. D'addabbo, F. Lovergine, V. De Pasquale, G. Pepe, P. Brandolini, A. Cevasco, D. Capolongo, "Sediment mobility and connectivity in a catchment: A new mapping approach," *Science of The Total Environment*, 672, pp. 763–775, 2019, doi:[10.1016/j.scitotenv.2019.03.461](https://doi.org/10.1016/j.scitotenv.2019.03.461)
- N.M. De Musso, D. Capolongo, A. Refice, F.P. Lovergine, A. D'addabbo, L. Pennetta, "Spatial evolution of the December 2013 Metaponto plain (Basilicata, Italy) flood event using multi-source and high-resolution remotely sensed data," *Journal of Maps*, 2018, Vol. 14, No. 2, pp. 219-229, doi:[10.1080/17445647.2018.1454349](https://doi.org/10.1080/17445647.2018.1454349)
- A. D'Addabbo, A. Refice, F. P. Lovergine, and G. Pasquariello, "DAFNE: A Matlab toolbox for Bayesian multi-source remote sensing and ancillary data fusion, with application to flood mapping," *Computers and Geosciences*, vol. 112, pp. 64–75, 2018, doi:[10.1016/j.cageo.2017.12.005](https://doi.org/10.1016/j.cageo.2017.12.005).
- A. Belmonte, A. Refice, F. Bovenga, G. Pasquariello, R. Nutricato, "Unwrapping-Free Interpolation of Sparse DInSAR Phase Data: Experimental Validation", *International Journal of Remote Sensing*, Vol. 38, No. 4, 1006–1022, 2017, ISSN: 1366-5901; doi: [10.1080/01431161.2016.1275055](https://doi.org/10.1080/01431161.2016.1275055).
- A. D'Addabbo, A. Refice, G. Pasquariello, F. P. Lovergine, D. Capolongo, S. Manfreda, "A Bayesian Network for Flood Detection Combining SAR Imagery and Ancillary Data", *IEEE Transactions on Geoscience and Remote Sensing*, Vol. 54, No. 6, pp. 3612–25, 2016, ISSN: 0196-2892, doi:[10.1109/TGRS.2016.2520487](https://doi.org/10.1109/TGRS.2016.2520487)
- Brandolini, P. and Cevasco, A. and Capolongo, D. and Pepe, G. and Lovergine, F. and Del Monte, M. (2018) Response of terraced slopes to a very intense rainfall event and relationships with land abandonment: a case study from Cinque Terre (Italy) in Land degradation & development. doi: [http://dx.doi.org/10.1002/ldr.2672](https://dx.doi.org/10.1002/ldr.2672)
- Nicoletta Maria de Musso, Domenico Capolongo, Alberto Refice, Francesco Paolo Lovergine, Annarita D'Addabbo and Luigi Pennetta (a) (2018) Spatial evolution of the December 2013 Metaponto plain (Basilicata, Italy) flood event using multi-source and high-resolution remotely sensed data in Journal of maps, DOI: [http://dx.doi.org/10.1080/17445647.2018.1454349](https://dx.doi.org/10.1080/17445647.2018.1454349)

Books and Book Chapters

- A. Refice, A. D'Addabbo, F.P. Lovergine, K. Tijani, A. Morea, R. Nutricato, F. Bovenga, and D.O. Nitti (2018) "Monitoring Flood Extent and Area Through Multisensor, Multi-temporal Remote Sensing: The Strymonas (Greece) River Flood", in A. Refice, A. D'Addabbo, and D. Capolongo (eds), *Flood Monitoring through Remote Sensing*, Springer International Publishing AG, ISBN: 978-3-319-63958-1 (print), 978-3-319-63959-8 (online), pp. 101–113. doi:[10.1007/978-3-319-63959-8\\_5](https://doi.org/10.1007/978-3-319-63959-8_5).

*Francesco Lovergine*