Curriculum Vitæ et Studiorum

Personal information	
Name	**Luigi Ranghetti**
Address	Via Piane 5 – 24027 Nembro (BG)
Phone	(+39) 340 8401477 (mobile) – 02 23699454 (office) – 035 19965625 (VoIP) – 0382 1852182 (fax)
Nationality	Italian
Date and place of birth	Bergamo (IT), 04/02/1986
Email	ranghetti.l@irea.cnr.it
GitHub	ranghetti

Sex	Male
Driving license	B
PEC	luigi.ranghetti@postemail.postecert.it
ResearchGate	Luigi_Ranghetti

Work experience

Position held	**Temporary research fellow**
Period of activity	From 2015-04-01
Employer	Institute for Electromagnetic Sensing of Environment – *Consiglio Nazionale delle Ricerche* (CNR-IREA) Via Corti 12, Milano (MI, IT)
Main activities and responsibilities	Management of spatial data through R code development, GIS analysis (R, QGIS, GDAL, PostGIS) and database storing (PostgreSQL). In particular:

- development of R packages to simplify the execution of recurring routines for data processing:
  - `fidolasen` (https://ranghetti.github.io/fidolasen, currently under development), an R package with the aim to find, download and preprocess Landsat and Sentinel-2 images;
  - `MODIStsp` (https://lbusett.github.io/MODIStsp), an R package for preprocessing MODIS time series (level-3 products);
  - `sprawl` (https://lbusett.github.io/sprawl), a set of functions useful to simplify the execution of common spatial processing tasks by providing a single simpler access point to functionalities spread in the R packages ecosystem.
- Development of other methodologies for the analysis of remotely sensed data:
  - Creation and maintenance of the data infrastructure needed by ERMES project activities (https://github.com/ranghetti/WARM_DB_Management): automatically collecting input data need by ERMES-WARM modelling solutions (weather data using API queries and remotely sensed data), storing them in a PostgreSQL database, running modelling solutions and performing post-processing operations (storing output data in the database, performing spatial aggregation on administrative units and generating the required reports with R Markdown);
  - semi-automation of the spatial interpolation routines required to interpolate yield data collected by agricultural machinery (https://github.com/ranghetti/yieldmaps, currently under development), and use of Sentinel-2 data to improve the soundness of the output maps;
  - spatial estimation of the proportion of flooded rice fields in the Italian rice district using MODIS data and quantification of the reduction of the practice of flooding during rise seeding in the period 2000-2016.
- Creation and maintenance of KVM virtual machines (Ubuntu, openSUSE, Windows Server 2012) used for automatic data processing and data exposure.

Education and training

Qualification awarded	**Ph.D. Degree in Experimental Ecology and Geobotany**
Date	2015-02-05
Period of activity	2011-11-01 – 2014-10-31
Institution	*Università degli Studi di Pavia* (IT)
Principal subjects covered and skills acquired	Remote sensing, Ecology, Agronomy. Thesis: "Using remotely sensed estimators to detect temporal trends of ecological predictors: the cases of nutritional content of alpine grasslands and water management in ricefiels".

Qualification awarded	**Master Degree in Natural Sciences** *(classe delle lauree magistrali in Scienze della Natura LM-60, D.M. 270/2004)*
Date	2011-09-22
Period of activity	2009-10-01 – 2011-09-22
Institution	*Università degli Studi di Pavia* (IT)
Principal subjects covered and skills acquired	Idrobiology, Zoology. Thesis: "*Impatto delle opere di captazione idroelettrica sugli ambienti lotici del Parco Nazionale Gran Paradiso*".
Final mark	110/110 (full marks) and honours

Qualification awarded	**Bachelor Degree in Natural Sciences** *(classe delle lauree in Scienze e Teconlogie per l'Ambiente e la Natura L27, D.M. 509/1999)*
Date	2009-07-15
Period of activity	2006-10-01 – 2009-07-15
Institution	*Università degli Studi di Pavia* (IT)
Principal subjects covered and skills acquired	Ethology, Zoology. Thesis: "*Eco-etologia della marmotta alpina (Marmota marmota): distribuzione spaziale e temporale delle attività*".
Final mark	110/110 (full marks) and honours

Qualification awarded	**Secondary School Diploma (scientific studies)**
Period of activity	2000-10-01 – 2005-07-15
Institution	*Liceo Scientifico Statale "E. Amaldi"* - Alzano Lombardo (BG, IT)
Final mark	100/100

Other attended courses

Course	**Alpine Summer School 2013: Climate Change and the Mountain Environment**
Date	2013-06-18 – 2013-06-28
Institution	Institute of Atmospheric Sciences and Climate, *Consiglio Nazionale delle Ricerche* (CNR-ISAC)
Principal subjects covered and skills acquired	Atmospheric dynamics in mountain regions; hydrological cycle in the mountains; ecosystems and biodiversity; past climate variations in mountain regions; climate modelling in mountain regions (http://www.to.isac.cnr.it/aosta_old/aosta2013).
Teachers	Antonello Provenzale, Roy Rasmussen, Klaus Fraedrich, Guoxiong Wu, Angela Marinoni, Elisa Vuillermoz, Elisa Palazzi, Vincenzo Levizzani, Isabella Zin, Bodo Bookhagen, Samuel Morin, Vincent Favier, Sandra Lavorel, Marino Gatto, Ramona Viterbi, Graziano Rossi, Giovanni Amori, Valter Maggi, Carlo Barbante, Antonio Parodi, Dieter Kranzlmüller, Martin Beniston.

Course	**GEOSTAT: statistical computing meets geographical analysis**
Date	2012-09-03 – 2012-09-11
Institution	Institute for Geoinformatics, *Universität Münster* (DE)
Principal subjects covered and skills acquired	Spatial and spacetime classes in R; spatial aggregation and disaggregation methods; R as a GIS: overlay/aggregate, rgeos, osmar, networks; GRASS GIS tutorial; TGRASS (time-GRASS) tutorial; SAGA GIS tutorial; plotKML tutorial; spatio-temporal geostatistics (http://www.geostat-course.org/Muenster_2012).
Teachers	Roger Bivand, Gerard Heuvelink, Edzer Pebesma, Markus Neteler, Soeren Gebbert, Volker Wichman, Tomislav Hengl, Benedikt Gräler.

Course	**Remote sensing 2012: observe, measure and model**
Date	2012-06-18 – 2012-06-22
Institution	Dept. of Earth and Environmental Science, *Università degli Studi di Pavia* (IT)
Principal subjects covered and skills acquired	Use of satellite remote sensing to quantify terrestrial thermal changes; spectral mixture analysis; modelling, spatial assimilation and data fusion.
Teachers	Francesco Zucca, Chris Small, Mirco Boschetti, Monica Pepe, Andrea Taramelli.

Course	**Advances in species distribution modelling in ecological studies and conservation**
Date	2011-09-12 – 2011-09-18
Institution	*Università degli Studi di Pavia* (IT) – *Parco Nazionale Gran Paradiso* (IT)
Principal subjects covered and skills acquired	Modelling approaches for the spatial and numeric estimation of animal populations; presence-only modelling using MaxEnt; user accuracy with presence-absence data, Bayesian hierarchical modelling.
Teachers	Jane Elith, Gurutzeta Guillera-Arroita, Marc Kery, Francesco Rovero, Achaz von Hardenberg.

Teaching experience

Position	**GIS Lecturer**
Dates	2016-11-7 – 2016-11-11 (Course "Advanced GIS for Spatial Ecology") 2015-09-22 – 2015-09-26 (Course "GIS for Ecology") 2013-09-23 – 2013-09-26 (Course "Corso base di GIS")
Employer	*Wildlife Science* – Via Cossolo 68/A, 10029 Villastellone (TO, IT); *Cooperativa Eliante* – Via San Vittore 49, 20123 Milano (IT)
Principal subjects covered	Laboratory and practical classes on the use of GIS software (QGIS, R, PostgreSQL) and mobile apps to collect, edit, organise, analyse and geoprocess spatial data.

Position	**Subject expert in Zoology** *Cultore della materia BIO/05 – Zoologia*
Date	From 2014-03-24
Employer	*Università degli Studi di Pavia* (IT)
Principal subjects covered	Organisation of lessons for Master degree students about the use of R to compute and evaluate ecological diversity indices.

Position	**Naturalist guide**
Date	2010 to 2013
Employer	*Museo Civico di Storia Naturale*, Milano (IT)
Principal subjects covered	Naturalist guide for Primary and Post-Primary school children in a wildlife park (Oasi di Sant'Alessio, PV, IT).

Position	**University Tutor**
Date	2008 to 2010
Employer	*Università degli Studi di Pavia* (IT)
Principal subjects covered	Tutoring activity for Bachelor degree students.

Personal skills

| Mother tongue | Italian |

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2 Independent user	C1 Proficient user	B1 Independent user	B2 Independent user	B2 Independent user
French	B1 Independent user	B2 Independent user	B1 Independent user	B1 Independent user	B2 Independent user

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user
Common European Framework of Reference for Languages

Organisational / managerial skills

- Experience in planning and organising field campaigns to collect *in-situ* data (sampling design, logistic administration, problem solving), in particular in Alpine and farming environments.
- Attitude to self-organise activities (scheduling activities, managing priorities and deadlines) and to work in team.
- Experience in writing technical reports and scientific papers.

Job-related skills

- Strong experience in organising and processing data (especially spatial data) through GIS software and other languages and applications (including relational databases), in particular with R: spatial data formats (`sf`, `sp`, `spacetime`, `raster`), spatial processing (`raster`, `gdalUtils`, `sprawl`), string manipulation (`stringr`, regular expression), data visualisation (`ggplot2`, `leaflet`), building GUI interfaces (`shiny`, `gWidgets`), integration with python scripts (`reticulate`) and databases (`RpostgreSQL`), writing R packages.
- Experience with remotely sensed data processing, in particular with the use of MODIS and Sentinel-2 data for ecological and agronomic applications.
- Good knowledge of the common methods for statistical data analysis with R: spatio-temporal geostatistical analysis (`gstat`), linear regression, GLM, GAM and logistic regression (`lm`, `gam`), mixed models (`lmne`, `lme4`), multi-model inference (`MuMIn`), calibration-validation methods.

Digital competence

Programming languages	R (proficient), Python (independent), Perl (basic)
Markup / data exchange languages	LaTeX (proficient), Markdown (independent), HTML (independent), CSS (basic), XML (independent), JSON (independent)
Shell languages	Bash (independent)
Network protocols and virtualisation	SSH (independent), xrdp (independent), KVM (independent), Oracle VirtualBox (independent)
GIS	QGIS (proficient), GRASS (basic), ArcGIS (basic)
Image processing	gdal (proficient), PostGIS (independent), ENVI (basic), SAGA GIS (basic)
Data analysis	R (proficient), LibreOffice Calc (independent), Microsoft Excel (independent)
Word processor	TeXLive (proficient), Lyx (independent), LibreOffice Writer (independent), Microsoft Word (independent)
Graphic editing	GIMP (independent), Inkscape (independent), UFRaw (independent), imagemagick (independent)
Databases	PostgreSQL (independent), MySQL (basic), SQLite (basic), BibTex (independent)
Web publishing	Joomla (independent), Drupal (basic), Wordpress (basic)
Operating systems	Linux: ArchLinux (proficient), Ubuntu and derivatives (independent), Debian/Raspbian (basic), Windows: XP, 7, 8, 10, Server 2012 (independent)

Publications

Peer-reviewed publications

G. Manfron, S. Delmotte, L. Busetto, L. Hossard, **L. Ranghetti**, P. A. Brivio & M. Boschetti (2017). «Estimating inter-annual variability in winter wheat sowing dates from satellite time series in Camargue, France». *International Journal of Applied Earth Observation and Geoinformation*, 57, pp. 190-201, ISSN: 0303-2434, doi: 10.1016/j.jag.2017.01.001.

L. Busetto, S. Casteleyn, C. Granell, M. Pepe, M. Barbieri, M. Campos-Taberner, R. Casa, F. Collivignarelli, R. Confalonieri, A. Crema, F. Garcia-Haro, L. Gatti, I. Gitas, A. Gonzalez-Perez, G. Grau-Muedra, T. Guarneri, F. Holecz, D. Katsantonis, C. Minakou, I. Miralles, E. Movedi, F. Nutini, V. Pagani, A. Palombo, F. Di Paola, S. Pascucci, S. Pignatti, A. Rampini, **L. Ranghetti**, E. Ricciardelli, F. Romano, D. Stavrakoudis, D. Stroppiana, M. Viggiano, M. Boschetti (2017). «Downstream Services for Rice Crop Monitoring in Europe: From Regional to Local Scale». *IEEE journal of selected topics in applied earth observations and remote sensing*, 10, pp. 5423-5441, ISSN: 1939-1404, doi: 10.1109/JSTARS.2017.2679159.

L. Ranghetti, L. Busetto, A. Crema, M. Fasola, E. Cardarelli & M. Boschetti (2016). «Testing estimation of water surface in Italian rice district from MODIS satellite data». *International Journal of Applied Earth Observation and Geoinformation*, 52, pp. 284-295, ISSN: 0303-2434, doi: 10.1016/j.jag.2016.06.018.

L. Ranghetti, B. Bassano, G. Bogliani, A. Palmonari, A. Formigoni, L. Stendardi and A. von Hardenberg (2016). «MODIS time series contribution for the estimation of nutritional properties of alpine grassland». *European Journal of Remote Sensing*, 49, pp. 691-718, ISSN: 2279-7254, doi: 10.5721/EuJRS20164936.

L. Busetto & **L. Ranghetti** (2016). «MODIStsp: an R package for automatic preprocessing of MODIS Land Products time series». *Computers & Geosciences*, 97, pp. 40-48, ISSN: 0098-3004, doi: 10.1016/j.cageo.2016.08.020.

C. Pasquaretta, G. Bogliani, C. Ferrari, **L. Ranghetti** & A. von Hardenberg (2012). «The Animal Locator: a new method for the accurate and fast collection of animal locations for visible species». *Wildlife Biology*, 18, 2, pp. 202-214, ISSN: 0909-6396, doi: 10.2981/10-096.

Abstract in national and international conferences

L. Ranghetti, L. Busetto, A. Crema, M. Fasola, E. Cardarelli & M. Boschetti. «Stima delle variazioni della superficie allagata in risaia nel distretto lombardo-piemontese tramite dati MODIS per il periodo 2000-2014». *Conferenza ASITA 2015*, Lecco (Italy), 2015-09-29 – 2015-10-01: pp. 913-916, ISBN: 978-88-941232-2-7.

F. Nutini, M. Boschetti, **L. Ranghetti**, L. Busetto, R. Braggio, C. Franchino, P.A. Brivio. «Stima di Mappe di LAI su are risicole lombarde utilizzando immagini ad alta risoluzione e tecnologie smart». *Conferenza ASITA 2015*, Lecco (Italy), 2015-09-29 – 2015-10-01: pp. 613-616, ISBN: 978-88-941232-2-7.

G. Fontanelli, F. Holecz, F. Collivignarelli, L. Gatti, M. Barbieri, D. Katsantonis, C. Dramalis, A. Kalaitzidis, **L. Ranghetti**, L. Busetto, M. Boschetti. «Mappatura della coltivazione e monitoraggio della crescita di riso nel distretto agricolo di Salonicco (Grecia) tramite l'utilizzo di dati SAR». *Conferenza ASITA 2015*, Lecco (Italy), 2015-09-29 – 2015-10-01: pp. 399-400, ISBN: 978-88-941232-2-7.

M. Fasola, E. Cardarelli, D. Pellitteri-Rosa & **L. Ranghetti**. «The recent decline of heron populations in Italy and the changes in rice cultivation practice». *26th International Ornithological Congress*, Tokyo (Japan), 2014-08-18 – 2014-08-24. Ornithological Science 13 (Supp. 2014): p. 8, ISBN/ISSN: 1347-0558.

E. Cardarelli, **L. Ranghetti**, C. Grieco, R. Sindaco, V. Longoni, G. Bogliani & M. Fasola. «Cambiamenti colturali delle risaie italiane e disponibilità trofica per gli Ardeidi». *XVII Convegno Italiano di Ornitologia*, Trento (Italy), 2013-09-11 – 2013-09-15, ISBN/ISSN: 978-88-8443-504-0.

Posters and communications

S. Imperio, **L. Ranghetti**, J. von Hardenberg, A. Provenzale, E. Boncompagni & M. Fasola. «Effects of protection status, climate, and water management of rice fields on longterm population dynamics of herons and egrets in north-western Italy». *6th Symposium for Research in Protected Areas*, Salzburg (Austria), 2017-11-02 – 2017-11-03.

L. Ranghetti, A. von Hardenberg, B. Bassano & G. Bogliani. «Response of grassland seasonal patterns to climate change in Gran Paradiso National Park». *Wavelength Conference 2013 by Remote Sensing and Photogrammetric Society (RSPSoc)*, Glasgow (United Kingdom), 2013-03-11 – 2013-03-13.

L. Ranghetti, A. von Hardenberg, B. Bassano & G. Bogliani. «Variations in nutritional content of grasslands and population dynamics of Alpine ibex: a spatio-temporal approach using remotely-sensed imagery». *22nd Meeting of the Alpine Ibex European Specialist Group (GSE-AIESG)*, Zernez (Switzerland), 2012-10-26 – 2012-10-28.

C. Pasquaretta, G. Bogliani, E. Castoldi, C. Ferrari, **L. Ranghetti**, L. Zubani & A. von Hardenberg. «Resource availability and altitude affect home range size and growth rate of free-ranging Alpine marmots (Marmota marmota)». *The 10th International Mammalogical Congress,* Mendoza (Argentina), 2009-08-09 – 2009-08-14.

International projects	

Project name	**ERMES – An Earth Observation Model Based Rice Information Service**
Type and duration	European Union's Seventh Framework Programme for research, technological development and demonstration (FP7 2007-2013, ERMES project, grant agreement n◦ 606983), 2014-2017
URL	http://www.ermes-fp7space.eu (main), http://www.ermes-fp7space.eu/it/work-package-deliverables/deliverables-view-all (reports)
Technical reports	I. Gitas, D. Stavrakoudis, A. Dimitrakopoulos, H. Minakou, T. Katagis, M. Pepe, F. Nutini, M. Boschetti, A. Crema, L. Busetto, **L. Ranghetti**, S. Pascucci, S. Pignatti, A. Palombo, M. Campos-Taberner, J. García-Haro, G. Grau-Muedra, M. Barbieri, L. Gatti, C. Gilardelli, T. Guarneri, R. Confalonieri (2017). Deliverable 8.2 – Ermes local products technical and scientific validation report v1.
	L. Busetto, M. Boschetti, **L. Ranghetti**, F. Holecz, M. Barbieri, L. Gatti, F. Collivignarelli, M. Campos – Taberner, V. Pagani. Deliverable 9.10 – Report of extra European demonstration case.
	L. Busetto, A. Crema, M. Boschetti, F. Nutini, **L. Ranghetti**, D. Stavrakoudis, I. Gitas, A. Dimitrakopoulos, H. Minakou, S. Pascucci, S. Pignatti, A. Palombo, S. Casteleyn, C. Granell, N. Miralles, M. Campos-Taberner, J. Garcis-Haro, G. Grau, M. Barbieri, T. Guarneri, V. Pagani, R. Confalonieri (2017). Deliverable 9.8 – Report of local service demonstration for the three case studies: second year v1.
	F. Holecz, L. Gatti, M. Barbieri, M. Campos-Taberner, J. Garcia-Haro, G. Grau Muedra, L. Busetto, M. Boschetti, **L. Ranghetti**, F. Romano, E. Ricciardelli, M. Viggiano, V. Pagani, R. Confalonieri, T. Guarneri, C. Granell, S. Casteleyn (2017). Deliverable 9.4 – Report of regional service demonstration for the three case studies: second year v1.
	J. García-Haro, M. Campos-Taberner, G. Grau-Muedra, L. Busetto, M. Boschetti, **L. Ranghetti**, F. Nutini (2016). Deliverable 5.11 – Report on processing chain for "crop bio physical parameters and phenology" v1.
	M. Boschetti, L. Busetto, M. Pepe, I. Tomasoni, A. Rampini, **L. Ranghetti**, A. Crema, F. Nutini, F. Holecz, M. Barbieri, J. Garcia-Haro, M. Campos, G. Grau, D. Stavrakoudis, H. Minakou, R. Confalonieri, V. Pagani, T. Guarneri, G. Cappelli, E. Moved, S. Castelyn, C. Granell, S. Trilles, I. Miralles, D. Kastantonis, C. Dramalis, S. Vyzantinopoulos (2016). Deliverable 2.3 – Report on the technical project progress report for second interim review.
	D. Stavrakoudis, I. Gitas, D. Karamanolis, H. Minakou, L. Busetto, A. Crema, M. Boschetti, F. Nutini, **L. Ranghetti**, S. Pascucci, S. Pignatti, S. Casteleyn, S. Trilles, C. Granell, M. Campos-Taberner, J. Garcis-Haro, G. Grau, T. Guarneri, R. Confalonieri (2016). Deliverable 9.7 – Report of local service demonstration for the three case studies: first year v0 task task.
	V. Pagani, L.. Busetto, **L. Ranghetti**, M. Campos-Taberner, G. Grau, F. Holecz, M. Barbieri, F. Romano, E. Ricciardelli (2016). Deliverable 9.1 – Rrs products package for the three case studies: first year.
	F. Holecz, L. Gatti, M. Barbieri, M. Campos-Taberner, J. Garcia-Haro, G. Grau Muedra, L. Busetto, M. Boschetti, **L. Ranghetti**, F. Romano, E. Ricciardelli, M. Viggiano, V. Pagani, R. Confalonieri, T. Guarneri, C. Granell, S. Cateleyn (2016). Deliverable 9.3 – Report of regional service demonstration for the three case studies: first year v0.
	S. Bregaglio, T. Stella , R. Confalonieri, **L. Ranghetti** (2015). Deliverable 6.3 – Report on customised model for regional rice monitoring v0.
	S. Bregaglio, T. Stella , R. Confalonieri, **L. Ranghetti** (2015). Deliverable 6.7 – Report on customised model for high resolution monitoring system at local scale v0.
	J. Garcia-Haro, M. Campos-Taberner, A. Moreno, M. Amparo Gilabert, L. Busetto, M. Boschetti, **L. Ranghetti**, G. Manfron, F. Nutini, F. Holecz, M. Barbieri, L. Gatti (2015). Deliverable 5.10 – Report on processing chain for "crop bio physical parameters and phenology" v0.
	D. Karamanolis, C. Karydas, C. Minakou, M. Pepe, L. Busetto, **L. Ranghetti** (2015). Deliverable 5.1 – ERMES data and products catalogue v0.

Project name	**GREAT – Grandi Erbivori negli Ecosistemi Alpini in Trasformazione**
Type and duration	European Union's InterReg – Cross-border cooperation program Italy-Switzerland
URL	http://www.greatinterreg.eu (main), http://www.greatinterreg.eu/risultati.php (reports)
Technical reports	**L. Ranghetti** (2014). «Estimation of temporal nutritional changes of alpine grassland from NDVI data».
	L. Ranghetti (2014). «A protocol to monitor the phenology and nutritional content of grasslands».
	A. von Hardenberg, R. McCrea, **L. Ranghetti**, B. Bassano, S. Grignolio, A. Provenzale, B. Morgan (2014). «Modelling the dynamics of a declining mountain ungulate population integrating total population counts and individual life history data».