

Irene GARCIA-MARTI

PhD Data Scientist

[in](https://www.linkedin.com/in/irene-garcia-marti-704a3a2a/) linkedin.com/in/irene-garcia-marti-704a3a2a/ / github.com/Irene-GM
☎ +31 628795342 @ garciamarti@knmi.nl
📍 Martinus Nijhofflaan 11C, 2624ER Delft, the Netherlands
📌 Data science, machine learning, climate services, environmental modelling



PhD Data Scientist with a background in Geoinformatics (MSc) and Computer Science (BSc) keen on solving complex scientific problems through the spatio-temporal analysis of GIS data collections. Currently, I have six years of specialization in data analysis and machine learning in the fields of climate services and environmental modelling. During this period, citizen science observations have been at the core of my analytical activities, this is why I acquired a broad experience at integrating volunteered observations with heterogeneous data sources and modelling them with data-driven methods. In addition to my analytical skills, I am technically versatile, this is why I am comfortable at working with spatial databases, web services, sensor webs or performing GIS analyses. Having good communication skills and a good understanding of computers and algorithms, makes me an effective presenter, capable of conveying complex results to all audiences.

EXPERIENCE

- | | |
|------------------------------------|--|
| Present
Feb 2018 | Data scientist, KNMI - ROYAL NETHERLANDS METEOROLOGICAL INSTITUTE, the Netherlands <ul style="list-style-type: none">> Application of machine learning methods to assess the impact that severe weather events have on distinct socio-economic sectors> Investigate the role of citizen weather observations to advance towards high-res weather forecast and crowdsourced numerical weather prediction.> Development of weather indicators based in citizen weather data to contribute to the design of an early warning system.> Advisor of M. Sc. students during the development of the research thesis. <p>machine learning spatio-temporal analysis climate services</p> |
| Jan 2018
Feb 2014 | Data scientist & Researcher, ITC, UNIVERSITY OF TWENTE, the Netherlands <ul style="list-style-type: none">> Creating and improving data-driven models capable of estimating tick dynamics> Developing novel models estimating, human exposure and risk of tick bites> Lecturer in technical M.Sc. subjects, with emphasis in programming and data analysis> Supervisor of M.Sc. students during the development of their research thesis <p>machine learning spatio-temporal analysis environmental modelling VGI</p> |
| Aug 2013
May 2013 | Intern at Esri Product Management Department, Esri, California, USA <ul style="list-style-type: none">> Creation or real-time monitoring tools integrating geo-events and web services> Process geo-events to feed an automated workflow for data dissemination <p>sensor webs web services javascript geodatabases</p> |
| Apr 2013
Oct 2012 | GIS Consultant for UN World Food Programme, GEOTEC RESEARCH GROUP, UNIVERSITY JAUME I, Spain <ul style="list-style-type: none">> Developing web-based interactive maps to display the status of WFP activities, assessments or indicators in the world> Provide a stable and dynamic access to WFP data services and integrate sources of spatial and non-spatial nature <p>web services javascript ArcGIS for Server</p> |
| Dec 2013
Mar 2011 | Research Assistant, GEOTEC RESEARCH GROUP, UNIVERSITY JAUME I, Spain <ul style="list-style-type: none">> ArcGIS software developer for SmartCampus project> Software developer for EUROGEOSS project (EU FP7 programme) <p>sensor webs java ArcGIS for Server</p> |

- 2019 | **PhD, ITC - UNIVERSITY OF TWENTE, the Netherlands**
2014 | Thesis title: Mapping tick dynamics and tick bite risk using data-driven approaches and volunteered observations
- > Data analysis
 - > Applications of machine learning
 - > Environmental modelling and public health
 - > Geographic information Science (GIS)
 - > Volunteered Geographic Information (VGI)
- 2011 | **MSc in Geospatial Technologies, UNIVERSITY JAUME I, SPAIN, University of Muenster, Germany**
2009 | Thesis title: Adding SOS Core & Transactional profiles support to a web thin client
- > Sensor Webs
 - > Sensor Observation Service
 - > Spatial databases and web services
 - > Geographic information Science (GIS)
- 2009 | **BSc in Computer Science Engineering, UNIVERSITY JAUME I, Spain**
2002 | Thesis title: Deployment of a Sensor Observation Service
- > Sensor Webs
 - > Sensor Observation Service
 - > Spatial databases

 TRAINING

- May 2020 | **Microservices Architecture, MITHUN/KNMI, the Netherlands**
- > Learning the architectural principles
 - > Thinking microservices for weather science
- Dec 2016 | **Statistics Netherlands (CBS) Data Camp 2015 & 2016, UNIVERSITY OF TWENTE, the Netherlands**
- > Combining big data technologies with GIS
 - > Work in a multidisciplinary team
- Sep 2016 | **Gaussian Process Summer School (GPSS), UNIVERSITY OF SHEFFIELD, UK, the Netherlands**
- > Introduction to Gaussian Processes
 - > Kernel design and methods for uncertainty quantification
- Jan 2016 | **Essential skills in data-intensive research, SURF, UTRECHT, the Netherlands**
- > Tools to optimize computer-intensive processes
 - > Basics of high-performance computing
- Nov 2015 | **QGIS, UNIVERSITY OF TWENTE, the Netherlands**
- > Cartography with QGIS
 - > QGIS Server and web mapping
- Oct 2015 | **Research Data Management, UNIVERSITY OF TWENTE, the Netherlands**
- > Designing a data management plan
 - > Legal and ethical issues in data handling

PROGRAMMING SKILLS

DEC 2016 - APR 2017

Lecturer, ITC - University of Twente. Teaching Python from data types to functions, gradually moving towards geospatial analytics by introducing to the students the use of multidimensional arrays and matrices, and establishing a link with raster and vector geospatial data collections

SPATIO-TEMPORAL ANALYTICS AND MODELLING

JUN - JUL 2015/2017

Lecturer, ITC - University of Twente. Teaching the basics of machine learning by introducing to the students classification and regression operations using ensemble learning methods

GEO-HEALTH: IMPROVING PUBLIC HEALTH THROUGH GIS

JUN 2016

Lecturer, ITC - University of Twente. Contribution to this massive open online course (MOOC) by teaching how machine learning methods can aid at predicting tick dynamics, which in turn, are associated to disease transmission

USING GIS IN DISEASE CONTROL PROGRAMMES

JUN 2014 - 2017

Guest lecturer, ITC - University of Twente. Contribution to this refresher course by showing different study cases modelling tick dynamics and risk of tick bites, by combining machine learning methods and volunteered data

★ GRANTS AND AWARDS

- 2020 Amazon Web Services (AWS): Research grant to advance the development of a data service providing quality-controlled volunteered weather observations, USA.
- 2018 European Space Agency (ESA): Team awarded with the 2nd prize at the annual ϕ -week Bootcamp for start-up design, Frascati, Rome (Italy)
- 2015 USA National Science Foundation (NSF): Student Travel Grant to attend the 13th International Conference of GeoComputation, Dallas (USA)

TECHNICAL SKILLS

Programming	Python, R, Java, Javascript, C++, HTML
Machine learning	scikit-learn, numpy, Gpy, mgcv
Data carpentry	pandas, rasterio, xarray
Geospatial tools	GDAL, QGIS, ArcGIS, OGR, GRASS
Databases	PostgreSQL, PostGIS, MySQL, MongoDB
Cloud technologies	GEE, AWS, GCP

✓ AREAS OF EXPERTISE

- > Spatio-temporal data analysis
- > Machine learning
- > Climate services research
- > Environmental modelling

🌐 LANGUAGES

English	● ● ● ● ○
Catalan	● ● ● ● ●
Spanish	● ● ● ● ●
French	● ● ○ ○ ○

+ SOFT SKILLS

- > Strong analytical skills
- > Good communication skills
- > Fast and independent learner
- > Team player

@ REFERENCES

Prof. Dr. Raul Zurita-Milla

ITC, UTWENTE, THE NETHERLANDS

@ r.zurita-milla@utwente.nl

☎ +31 534874367

Dr. Cees de Valk

KNMI, THE NETHERLANDS

@ cees.de.valk@knmi.nl

☎ +31 302206522

Dr. Emma Izquierdo-Verdiguier

IVFL, BOKU, AUSTRIA

@ emma.izquierdo@boku.ac.at

☎ +43 14765485733

PUBLICATIONS

- MODELLING TICK BITE RISK BY COMBINING RANDOM FORESTS AND COUNT DATA REGRESSION MODELS** DEC 2019
Garcia-Marti, I., Zurita-Milla, R. & Swart, A.
[PLOS ONE](#)
- USING VOLUNTEERED OBSERVATIONS TO MAP HUMAN EXPOSURE TO TICKS** OCT 2018
Garcia-Marti, I., Zurita-Milla, R., Harms, M. G. & Swart, A.
[Nature Scientific Reports](#)
- MODELLING AND MAPPING TICK DYNAMICS USING VOLUNTEERED OBSERVATIONS** NOV 2017
Garcia-Marti, I., Zurita-Milla, R., van Vliet, A. J. H. & Takken, W.
[Intl. J. of Health Geographics](#)
- IDENTIFYING ENVIRONMENTAL AND HUMAN FACTORS ASSOCIATED WITH TICK BITES USING VOLUNTEERED REPORTS AND FREQUENT PATTERN MINING** MAY 2016
Garcia-Marti, I., Zurita-Milla, R., Swart, A., van den Wijngaard, C. C., van Vliet, A. J. H., Bennema, S. & Harms, M.
[Transactions in GIS](#)
- WEATHER AND CLIMATE SCIENCE IN THE DIGITAL ERA** PRE-PRINT
de Vos, M., Hazeleger, W., Behrends, J., Bendoukha, S., Garcia-Marti, I., van Haren, R., Haupt, SE., Hester, M., Hut, R., Jansson, F., Mueller A., Neilley, P., van den Oord, G., Pelupessy, I., Ruti, P., Schultz, MG. & Walton, J.
[Geosciences Communication](#)
- A DATA-DRIVEN APPROACH TO PREDICT FUTURE HEAT DEMAND IN THE BUILT ENVIRONMENT: A CASE STUDY IN THE NETHERLANDS** IN REVIEW
Liu, W., Ntalla, S., Garcia-Marti, I., van der Schrier, G. & Geertsema, G.
[Energy and Buildings](#)
- TEMPORAL-SPATIAL VARIATION IN QUESTING TICK ACTIVITY IN THE NETHERLANDS: THE EFFECT OF CLIMATIC AND HABITAT FACTORS** FEB 2019
Hartemink, N., van Vliet, A. J. H., Sprong, H., Jacobs, F., Garcia-Marti, I., Zurita-Milla, R. & Takken, W.
[Vector-Borne and Zoonotic Diseases](#)
- STUDYING SOIL MOISTURE AT A NATIONAL LEVEL THROUGH STATISTICAL ANALYSIS OF NASA NLDAS DATA** NOV 2015
Espinoza-Dávalos, G. E., Arctur, D. K., Teng, W., Maidment, D. R., Garcia-Marti, I. & Comair, G.
[J. of Hydroinformatics](#)

CONFERENCES

- USING VOLUNTEERED WEATHER OBSERVATIONS TO EXPLORE REGIONAL WEATHER PATTERNS IN THE NETHERLANDS** DEC 2019
Garcia-Marti, I, de Haij, M., Noteboom, J. W., van der Schrier, G. & de Valk, C.
American Geophysical Union (AGU) Fall Meeting 2019, San Francisco, USA
- ASSESSING THE QUALITY OF VOLUNTEERED WEATHER OBSERVATIONS TO PROVIDE HIGH-RESOLUTION WEATHER MAPS** NOV 2019
Garcia-Marti, I, van der Schrier, G. & Noteboom, J. W.
12th EUMETNET Data Management Workshop, Utrecht, the Netherlands
- DETECTING PROBABILITY OF ICE FORMATION ON OVERHEAD LINES OF THE DUTCH RAILWAY NETWORK** OCT 2018
Garcia-Marti, I, van der Schrier, G., Noteboom, J. W. & Diks, P.
14th eScience IEEE Conference 2018, Amsterdam, the Netherlands
- MODELLING AND MAPPING TICK DYNAMICS USING VOLUNTEERED OBSERVATIONS** NOV 2017
Garcia-Marti, I., Zurita-Milla, R., van Vliet, A. J. H. & Takken, W.
Symposium of the Netherlands Center of Geodesy and Geo-informatics (NCG), Delft, the Netherlands
- TOWARDS THE MODELLING AND MAPPING OF QUESTING TICKS USING RANDOM FOREST** JUL 2017
Garcia-Marti, I. & Zurita-Milla, R.
4th Conference of Spatial Statistics, Lancaster (UK)
- GEOSPATIAL DATA MINING IN VOLUNTEERED DATA: HOW NATURAL CONDITIONS MIGHT INCREASE THE RISK OF TICK BITES AND LYME DISEASE?** MAY 2015
Garcia-Marti, I., Zurita-Milla, R., Swart, A., van den Wijngaard, C. C., van Vliet, A. J. H., Bennema, S. & Harms, M.
13th International Conference of GeoComputation, Dallas, Texas (USA)
- A COMPARATIVE STUDY ON VGI AND PROFESSIONAL NOISE DATA** JUN 2014
Garcia-Marti, I., Torres-Sospedra, J., Rodriguez-Pupo, L. E. & Huerta, J.
17th AGILE Conference on Geographic Information Science, Castelló, Spain
- NOISE BATTLE: A GAMIFIED APPLICATION FOR ENVIRONMENTAL NOISE MONITORING IN URBAN AREAS** MAY 2013
Garcia-Marti, I., Rodriguez-Pupo, L. E., Díaz, L. & Huerta, J.
16th AGILE Conference on Geographic Information Science, Leuven, Belgium
- MOBILE APPLICATION FOR NOISE POLLUTION MONITORING THROUGH GAMIFICATION TECHNIQUES** SEP 2012
Garcia-Marti, I., Rodriguez-Pupo, L. E., Benedito-Bordonau, M., Trilles, S., Beltran, A. & Huerta, J.
11th International Conference of Entertainment Computing, Bremen, Germany