



Simona Cariello

📍 **Work** : Istituto Nazionale di Geofisica e Vulcanologia (INGV) – Sezione di Catania –
Osservatorio Etneo, Piazza Roma, 2 – 95125 Catania (Italia), 95125, Catania, Italy

✉ **Email**: simona.cariello@phd.unict.it ✉ **Email**: simona.cariello@ingv.it

☎ **Phone**: (+39) 3283767096

🔗 **Google Scholar**: https://scholar.google.com/citations?user=5_J4T44AAAAJ&hl=it&oi=ao

🔗 **ORCID ID**: <https://orcid.org/0000-0002-1074-9985>

Gender: Female **Date of birth**: 24 Feb 1998 **Nationality**: Italian

ABOUT ME

Current position: PhD student at INGV in Catania

RESEARCH INTERESTS

Summary

I am a PhD student in Engineering at the University of Catania, collaborating with the Etna Volcano Observatory (EVO) of the National Institute of Geophysics and Volcanology (INGV). My research interests lie in exploring the potential of artificial intelligence for monitoring volcanic hazards from space. My focus is on developing advanced predictive models that leverage various satellite data in both temporal and spatial domains to understand and forecast volcanic phenomena. I am involved in the activities of the Laboratory of Technologies for Volcanology (TechnoLab) at INGV-EVO, aiming to integrate traditional ground-based volcano monitoring systems with technological innovations in satellite remote sensing and advanced computational methods to better understand volcanic hazards.

Bibliometric Indicators

SCOPUS: h-index 1, citations 1, documents 2

Google Scholar: h-index 1, citations 2, documents 7

EDUCATION AND TRAINING

[31 Oct 2022 – Current]

PhD in "SYSTEMS ENGINEERING, ENERGY, INFORMATICS AND TELECOMMUNICATIONS" (XXXVIII cycle)

INGV and University of Catania

City: Catania

Country: Italy

Thesis: Exploring the potential of Artificial Intelligence for monitoring volcanic hazards from Space

[2020 – 2022]

MASTER DEGREE IN "AUTOMATION ENGINEERING AND CONTROL OF COMPLEX SYSTEMS"

University of Catania

City: Catania

Country: Italy

Thesis: Brain Computer Interface OpenVIBE - based for Home Automation

[2016 – 2020]

BACHELOR'S DEGREE IN "COMPUTER ENGINEERING"

University of Catania

City: Catania

Country: Italy

Thesis: Representation of the dynamics of the FHN neuron via CNN

LANGUAGE SKILLS

Mother tongue(s): ITALIAN

Other language(s):

English

LISTENING B2 READING B2 WRITING B2

SPOKEN PRODUCTION B2 SPOKEN INTERACTION B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Programming Language

Java | MATLAB e Simulink | C | Python | Assembly | VHDL | PLC Programming Language: LD, ST, FBD and SFC

Cloud Computing

Google Cloud | Google Colab | Google Earth Engine

Web Development

HTML | CSS | JavaScript | Website content and management (WordPress and Joomla)

Database Management

SQL / MYSQL | Oracle

Robotics and Automation

LTspice | CodeSyS | Arduino/Arduino IDE | NI LabView

MASTER'S DEGREE PROJECTS

Laboratory experience

- Microelectronics: Circuit analysis of Ackermann - Mossberg (using LTspice)
- Multibody analysis of a "Five bar Linkage" system (using MATLAB)
- MEG data Analysis in Biomedical Systems (using MATLAB)
- Development of a smartphone-based multisensory platform (using Labview)
- Analysis and simulation of the Depression as a complex dynamic system (using Matlab)
- Attitude control of the Mini Cheetah robot using the Motor Map neural network (using Matlab e CoppeliaSim)
- Control of the STEval pendulum by a PID controller (using Matlab and the STM32 microcontroller)
- Pick and Place controlling the UR10e six DOF robot (using ROS and Gazebo)

PUBLICATIONS

[2024] **How Artificial Intelligence can enhance monitoring of volcanoes from space**

Reference: S. Cariello, C. Corradino, C. Del Negro; Nuovo Cimento (accepted)

[2024]

Enhancing Detection Of Volcanic Ash Clouds From Space With Convolutional Neural Networks

Reference: F. Torrisi, C. Corradino, S. Cariello, C. Del Negro; JVGR. 2024, Volume 448, 108046;

Link: <https://doi.org/10.1016/j.jvolgeores.2024.108046>

[2024]

Cascading Machine Learning to Monitor Volcanic Thermal Activity Using Orbital Infrared Data: From Detection to Quantitative Evaluation

Reference: S. Cariello, C. Corradino, F. Torrisi, C. Del Negro; Remote Sens. 2024, 16(1), 171;

Link: <https://doi.org/10.3390/rs16010171>

[2023]

Brain-Computer-Interface-Based Smart-Home Interface by Leveraging Motor Imagery Signals

Reference: S. Cariello, D. Sanalidro, A. Micali, A. Buscarino, M. Bucolo; Inventions 2023, 8(4), 91;

Link: <https://doi.org/10.3390/inventions8040091>

[2023]

Convolutional Neural Networks for Volcanic Risk Assessment: An Automatic Approach to Assess the Elements at Risk from Space

Reference: S. Cariello; IEICE Proceedings. 2023, Volume 76, B4L-41;

[2023] [An Artificial Intelligence-based platform for volcanic hazard monitoring](#)

Reference: C. Del Negro, E. Amato, S. Cariello, C. Corradino, F. Torrisi, V. Zago; EGU23-15945;

[2023]

[On Artificial Intelligence-based emulators of physical models to forecast the evolution of lava flows](#)

Reference: V. Zago, E. Amato, S. Cariello, C. Corradino, F. Torrisi, C. Del Negro; EGU23-16305;

Link: <https://doi.org/10.5194/egusphere-egu23-16305>

[2023] **A Deep Convolutional Neural Network for Satellite Monitoring of Volcanic Clouds**

Reference: F. Torrisi, C. Corradino, S. Cariello, C. Del Negro; AGU23, 2023

[2023] [Deep Learning for volcanic risk assessment](#)

Reference: C. Corradino, S. Cariello, F. Torrisi, E. Amato, V. Zago, C. Del Negro; EGU23-15785

Link: <https://doi.org/10.5194/egusphere-egu23-15785>

CONFERENCES AND SEMINARS

[2024] **EGU General Assembly 2024** Vienna (14 - 19 Apr 2024)

How Machine Learning and Satellite Data Enhance Near-Real Time Detection of Volcanic Activity Worldwide - (Poster Presentation)

[2024] **Cities on Volcanoes 12 - COV12** La Antigua Guatemala (11 – 17 Feb 2024)

Towards improved forecasting of volcanic hazards using Artificial Intelligence applied to multispectral satellite imagery - (Oral Presentation)

[2024] **The 42nd National Conference of the GNGTS** Ferrara, Italy (13 – 16 Feb 2024)

Unveiling Hidden Volcano Dynamics with Artificial Intelligence (AI) and Earth Observation (EO) - (Oral Presentation)

[2023] **International Symposium on Nonlinear Theory and its Applications** Catania, Italy (26–29 Sept 2023)

A cascading machine learning approach for satellite volcanic hazard monitoring: from detection to quantitative evaluation - (Oral Presentation)

[2023] **109° Congresso Nazionale SIF (Italian Physical Society)** Fisciano (SA), Italy (11 – 15 Sep 2023)

How Artificial Intelligence can enhance a satellite volcano monitoring system - (Oral Presentation)

[2023] **International Workshop on High-Resolution Thermal EO 2023 (ESA)** Frascati, Italy (10–12 May 2023)

An Artificial Intelligence-based platform for Volcanic Hazard Monitoring - (Poster Presentation)

[2022] **5th Rittmann conference 2022** Catania, Italy (29 Sep – 1 Oct 2022)

Tracking Volcanic Clouds Using Machine Learning Techniques: The 2020-2022 Mt. Etna Paroxysms - (Oral Presentation)

HONOURS AND AWARDS

[Sep 2023]

Best Communication in Geophysics to the 109° National Conference of Italian Physics Society
Awarding institution: Physics Society (SIF)

RESEARCH EXPERIENCES *How Artificial Intelligence can enhance a satellite volcano monitoring system - (Oral Presentation)*

[Oct 2022 – Current] **Laboratory of Technologies for Volcanoes (TechnoLab), INGV**

[Mar 2022 – Oct 2022] **Brain Computer Interface Laboratory, University of Catania, Italy**

[1 Sep 2021 – 31 Dec 2021] **Curricular internship at National Institute of Geophysics and Volcanology (INGV), Catania**

SUMMER SCHOOL

[2 Jul 2023 – 7 Jul 2023] **AI-DLDA: International Summer School on Artificial Intelligence - Udine, Italy**

TEACHING ACTIVITY

[1 Mar 2024 – Current]

University Tutor

Bio - Electricity In Human Body: Systems And Control - (University of Catania)

ASSIGNMENTS AS CONVENER

[11 Feb 2024 – 17 Feb 2024]

COV12 - La Antigua Guatemala

Session 417: *Forecasting volcanic hazards: new technologies and probabilistic multi-source and multi-hazard assessment combining HPC and field data*

PERSONAL DATA

I authorize the processing of my personal data pursuant to Legislative Decree 30 June 2003, n. 196 "Code regarding the protection of personal data".

8 Mar 2024



Simona Cariello