

TEMPLATE PER INVIO ABSTRACT - Giornate Dipartimento 2023

-Riempiere tutti i campi richiesti - Testi Il testo deve essere redatto in lingua INGLESE

Area Tematica: Green Chemistry

Tipo di Comunicazione: ORAL COMMUNICATION

Titolo Abstract
(Iniziali Maiuscole)

AI Based Satellite And Ground Sensor Analysis For Surface Waters Protection: The EcoNet Project

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"Tor Vergata"

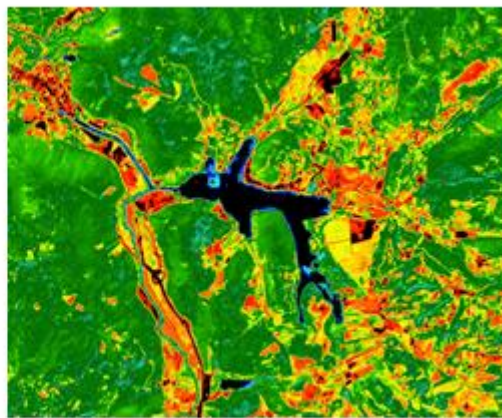
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Testo Abstract:

Surface freshwaters quality monitoring is of fundamental importance for the protection of the natural capital of freshwater ecosystems and water-related ecosystems, as well as to ensure the sustainable development of the relationship between water resources and the city, even outside the urban area. The environmental threats from unsustainable human activities can introduce various xenobiotic contaminants into the receiving waters, with hardly predictable effects on freshwater ecosystem's homeostasis. In this scenario, the existing freshwater monitoring system can hardly understand complex spatial and temporal alteration in ecosystems and it does not allow early actions to counter anthropic impacts on habitats and biodiversity. A still little explored environmental diagnostic approach concerns the use in situ of bio/chemosensoristic devices in combination with remote sensoristic technologies [1]. This possibility is now supported by the EcoNet project (ASI - CNR-ISMN Agreement n. 2022-32-HH.0) which promotes the development and demonstration of an integrated sensor-driven system, managed by artificial intelligence, which integrates data obtained from satellite images with those from in situ bio/chemosensoristic devices, for monitoring surface waters on which human settlements insist (www.econet.cnr.it). In particular, in situ sensoristic devices include the 'Snoop' prototype, a CNR-ISMN European patent [2] based on the use of one or more cellular sensitive materials coupled with other sensoristic probes, while sources of remote sensing data are PRISMA, Sentinel-2 and Landsat 8 imaging satellites.



a)



b)

Immagine_01 a) Detail of the multi-analyte sensor prototype b) Satellite image of Lago di Piediluco

Different models of neural networks such as Deep Neural Networks and Multi-Layer Perceptron Neural Networks are being considered for the Artificial Intelligence (AI) technology as tool of effective data processing and rapid response. This data analysis opens enormous potential for overcoming the limits of traditional environmental monitoring and diagnostic techniques, meeting the challenge of modern environmental diagnostics based on continuous and real-time monitoring through already defined indexes as well as expected new indices of early alert of environmental alteration in surface freshwaters. The test areas selected for carrying out the project activities are environmental sites of the Natura 2000 network (https://ec.europa.eu/environment/nature/natura2000/index_en.html), areas hosting rare and threatened species and/or habitats. The specific test areas for EcoNet projects are: Riserva Naturale Regionale "Selva del Lamone" (Farnese, Viterbo, Italy); Riserva Naturale Regionale "Nazzano Tevere-Farfa" (Nazzano, Roma, Italy); Lago di Piediluco (Piediluco, Terni, Italy). Beside the development of the integrated sensor-driven system, as part of the ASI's program "Innovation for Downstream Preparation for Science" (I4DP_SCIENCE). EcoNet points to create a new and complete downstream service to support user communities in managing of protected areas. Indeed, EcoNet activities also includes a training path dedicated to user community e.g., park rangers, as well as e-learning course and an internship to create new professional figures dedicated to

Eventuali immagini (non più di 2 tra figure, tabelle e schemi) andranno allegate separatamente nella e-mail di invio Abstract (accettato qualsiasi formato immagine: jpg, png, tiff, psd... ecc...). Indicare nel testo della casella "testo abstract" la posizione delle immagini con la dicitura [immagine_nome] (come da esempio).

Keywords: Integrated Analytical Systems, Remote Sensing, Natura 2000

References:

- [1] G. Grasso, D. Zane, and R. Dragone, "Field and Remote Sensors for Environmental Health and Food Safety Diagnostics: An Open Challenge", Biosensors, MDPI, Switzerland, pp. 1-3, 2022.
- [2] R. Dragone, C. Frazzoli, F. Monacelli, "Chemical-physical sensing device for chemical-toxicological diagnostics in real matrices (Snoop)". EU Patent, EP2697628 B1, 2015.
- [3] M.H. Gholizadeh, A.M. Melesse, and L. Reddi, "A Comprehensive Review on Water Quality Parameters Estimation Using Remote Sensing Techniques", Sensors, 16:8, pp. 1298, 2016.

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*Ai fini di una corretta lavorazione dei testi si prega cortesemente di non modificare la formattazione all'interno delle caselle, e di **non** modificare tipologia font e dimensioni font. Si prega inoltre di seguire scrupolosamente i suggerimenti indicati. L' ABSTRACT ed eventuali immagini dovranno essere inviate come allegati all'indirizzo mail conferenza-dsctm2023@ge.icmate.cnr.it*

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Grazie per la collaborazione.

