

GeoAI for Good: Harnessing Geospatial Intelligence to Solve Global Challenges

Andrea Manara

International Telecommunication Union

AI for Good

Workshop: The role of GeoAI and Foundational Models in shaping an AI-driven future for all

9 July 2025

aiforgood.itu.int

Image: NASA





**THE leading action-oriented,
global & inclusive United Nations
platform on AI**

ALL YEAR, ALWAYS ONLINE



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AI for Good
Discovery

AI for Earth and Sustainability
Science



AI for Good
Discovery

AI and Climate Science



AI for Good
Discovery

AI and Manufacturing



AI for Good
Discovery

AI and Finance



AI for Good
Discovery

AI and Work



AI for Good
Discovery

GeoAI



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ML5G



AI for Good
Discovery

Trustworthy AI



AI for Good
Discovery

AI in Humanitarian Action



AI for Good
Discovery

From Molecules to Models



AI for Good
Discovery

AI and Robotics



AI for Good
Discovery

AI and Health



AI for Good
Discovery

AI for Biodiversity



AI for Good
Discovery

Open Source AI for Digital Public
Goods

AI for Good | GeoAI activities

GeoAI Discovery

Channel on GeoAI applications, highlighting its relevance to the Sustainable Development Goals.

GeoAI Challenge

Competitions aimed at providing solutions for collaboratively addressing real-world geospatial problems by applying AI and ML.



Curator of the GeoAI Discovery



Maria Antonia Brovelli

Politecnico di Milano (UN GGIM AN Advisory Board, ISDE Vice President, ISPRS TC IV Vice President)

Past co-curators of the GeoAI Discovery



Nadine Alameh

Open Geospatial Consortium



Barbara Ryan

World Geospatial Industry





AI for Good | ITU Journal: Special issue on Geospatial AI

ITU Journal
Future and evolving
technologies

Special issue

Geospatial AI to advance the United Nations Sustainable Development Goals

FREE | FAST | FOR ALL



Leading Guest Editor



Maria Antonia Brovelli, Politecnico di Milano, Italy

[Exploring GeoAI for Good: A journey through webinars, workshops and global challenges](#)

by Maria Antonia Brovelli, Andrea Manara (ITU), Rohini Swaminathan (UNICEF)

[ITU Journal explores GeoAI innovation for the good of humanity - ITU](#)





AI for Good | ITU Journal: Special issue on Geospatial AI

[Leveraging large language models for floods mapping and advanced spatial decision support: A user-friendly approach with SATGPT](#)

Hamid Mehmood

Volume 6 (2025), Issue 1, Pages 57-66

[Utilization of satellite imagery and artificial intelligence for disaster management: Approaches and case studies](#)

Doyi Kim, Yeji Choi

Volume 6 (2025), Issue 1, Pages 47-56

[Conflict susceptibility mapping methodology and data experiments](#)

Timur Obukhov, Maria A. Brovelli

Volume 6 (2025), Issue 1, Pages 29-46

[Trends of recent data, AI/ML approaches for geospatial AI in Earth observation towards sustainable development goals](#)

Shivangi Somvanshi, Deepak Kumar, Maya Kumari

Volume 6 (2025), Issue 1, Pages 11-28

[Technical achievement and summary of the Geo-AI Challenge cropland extent mapping 2023](#)

Pengyu Hao, Mohammad Alasawedah, Stella Ofori-Ampofo, Julius Maina, Lorenzo Vita, Alexandre Nobajas Ganau, Zhongxin Chen

Volume 6 (2025), Issue 1, Pages 1-10

Problem statement	Organizations	Participants (Submitted)	Total Submissions	Countries (Africa)	Prize
Cropland Mapping	FAO, UNODC, UN Open GIS	333 (74)	2264	60 (23)	4'000 CHF

Competition Leaderboard

This is the final leaderboard. The competition is officially closed and will not accept any more submissions. Congratulations to all that participated, points were distributed on 14 December 2023.

RANK	USER	PUBLIC SCORE	PRIVATE SCORE	LAST SUBMISSION	# SUBMITTED
1	 Muhammed_Tuo	0.94	0.94666666	6 months ago	29
2	 antoine_saget	0.93333333	0.94380952	6 months ago	35
3	 masawdah	0.94	0.94095238	6 months ago	99
4	 sandrohu	0.92888888	0.93333333	6 months ago	6
5	 Adrian_Cal	0.93777777	0.93333333	6 months ago	24



AI for Good | GeoAI Discovery Channel



Online

22 May 2025 • 14:30 - 16:00

Optimizing zero-shot segmentation of Remote Sensing imagery using LangRS: A hands-on workshop

LangRS is a Python library designed to enable the use...



Online

26 March 2025 • 15:00 - 17:00

GeoAI workshop: Foundation models for weather and climate

The last few years have seen rapid progress at the...



Online

19 March 2025 • 15:00 - 17:00

Earth observation foundation models with Prithvi-EO-2.0 and TerraTorch

Would you like to enhance your skills in leveraging state-of-the-art...



Online

18 February 2025 • 15:00 - 16:30

Modeling population dynamics with AI: A hands-on workshop with the Population Dynamics Foundation Model

Explore the transformative potential of the Population Dynamics Foundation Model...



Online

5 February 2025 • 15:00 - 16:30

Mastering remote sensing image segmentation with AI: A hands-on workshop with the Segment Anything Model

Built upon Meta's Segment Anything Model (SAM), the SAMGeo Python...



Online

18 December 2024 • 16:30 - 18:00

2024 ITU GeoAI Challenge Finale

The ITU GeoAI Challenge aims to provide a platform for...



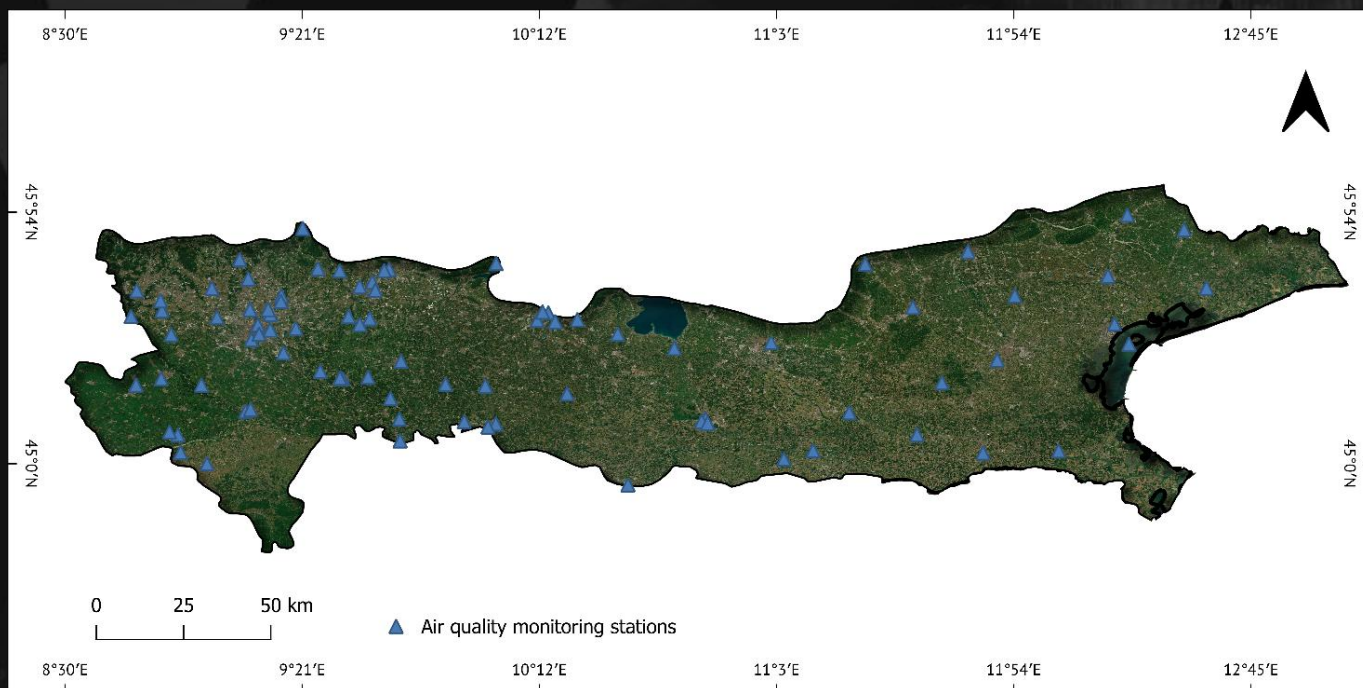
**Around 40 episodes
organized since 2021**

- **Webinars**
- **Workshops**
- **Challenge introductions and finale events**



Highlights from 2024 GeoAI challenges

Estimation of ground-level NO_2 concentrations using remote sensing data with machine learning approach



2024 GeoAI Challenge:
380 teams submitting ML solutions

- Ground truth data from air quality monitoring stations
- Remote sensing data on air pollution from Sentinel-5P TROPOMI
- Precipitation from CHIRPS
- Land surface temperature from NOAA

Politecnico di Milano, Dept. of Civil and Environmental Engineering
University of Padua, Interdept. Research Centre in Geomatics (CIRGEO)

AI for Good *Plastic mulched field mapping with satellite imagery*



Food and Agriculture Organization
of the United Nations

Agricultural plastic covers improves crop yield in water-deficient areas but plastic residue in soil has negative effects.



By Pengyu Hao, Zhongxin (FAO) Chen

2024 GeoAI Challenge:
78 teams submitting ML solutions



Develop a universal classification model for mapping plastic-mulched fields in three distinct test regions (Spain, Vietnam, Kenya)



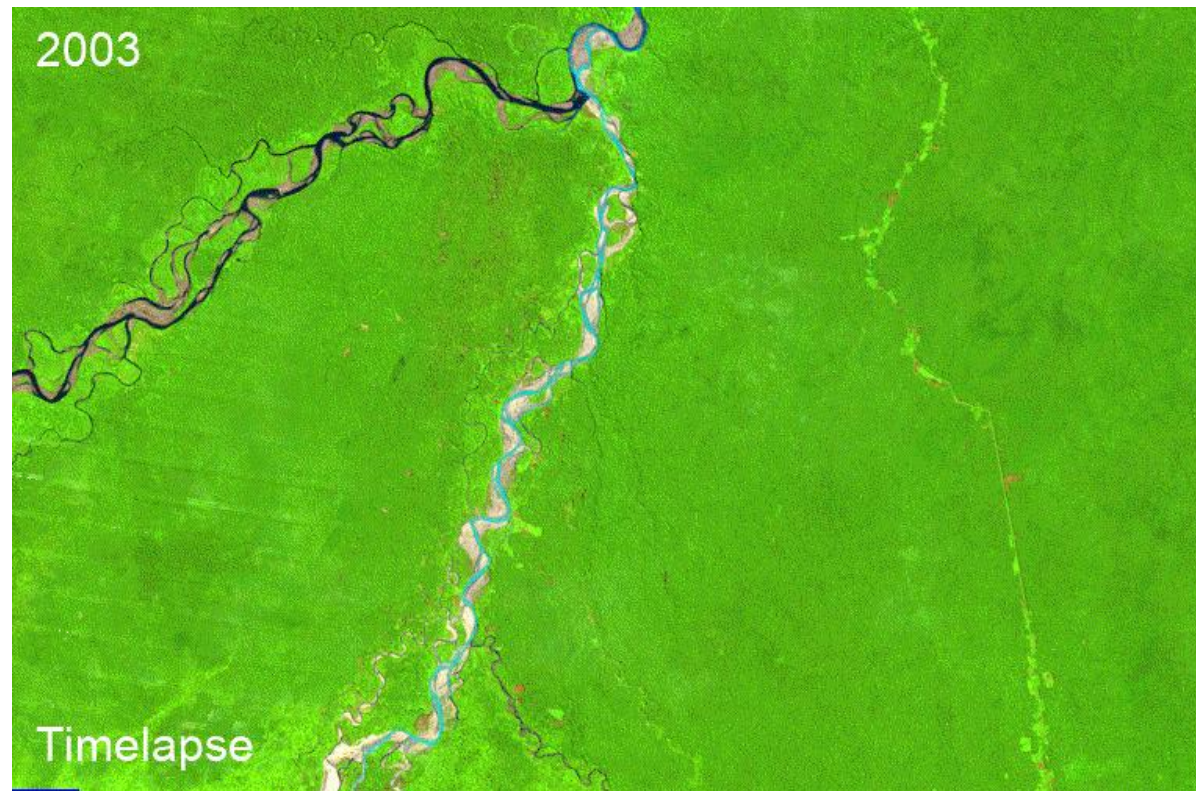
AI for Good *Mapping clandestine runways in the Peruvian Amazon*



2024 GeoAI Challenge
26 teams submitting ML solutions

- Develop models for automated runways detection
 - remote sensing technologies
 - spatial analysis
 - advanced AI algorithms
 - open-source satellite imagery





UNODC is currently carrying out research on spatial distribution and impact of clandestine airways. Available datasets derive from visual interpretation of HR to VHR satellite imagery.

Results

The top three participants identified use suitable solutions for leveraging **free-accessible** satellite data (**Sentinel-1 and Sentinel-2**) to automate the detection of runways in the Peruvian Amazon. The winner of the competition achieved an accuracy > 90%

The GeoAI Challenge 2024 provided UNODC with important insights to continue its research on near real-time mapping of clandestine runways in Latin America.

Jorge Caballero, jorge.caballeroespejo@un.org

Yixin Mao, yixin.mao@un.org

Lorenzo Vita, lorenzo.vita@un.org



INEGI UN-GGIM Vegetation Mapping Challenge

1 000 CHF

Challenge completed 7 months ago

169 joined 69 active

Skills you will learn [Classification](#)

[Info](#) [Data](#) [Leaderboard](#) [Accept terms](#)

Start ⓘ 02 Sep 24

Close ⓘ 29 Sep 24

Reveal ⓘ 10 Oct 24



INEGI UN-GGIM Human Settlement Detection Challenge

1 000 CHF

Challenge completed 7 months ago

192 joined 84 active

Skills you will learn [Classification](#)

[Info](#) [Data](#) [Chat](#) [Leaderboard](#) [Accept terms](#)

Start ⓘ 02 Sep 24

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Reveal ⓘ 10 Oct 24

Winners were recognized at the Seventh High-level Forum “Accelerating Implementation: Achieving Resilience” of the United Nations Global Geospatial Information Management held in Mexico City in October 2024.

2025 GeoAI challenges

July 11, 2025

16:45-17:00 Geo AI Challenges

FAO Cropland Mapping in Dry Environments Challenge

Speaker(s)



Pengyu Hao
IT Officer, Food and Agriculture
Organization of the United Nations
(FAO)

Global Initiative on Resilience to Natural Hazards through AI Solution. Classification for Landslide Detection Challenge

Speaker(s)



Lorenzo Nava
Research Associate in Multihazard
Remote Sensing, University of
Cambridge

ITU/ESA Ground cover height determination with Geospatial Foundation Model and Sentinel1/Sentinel 2 imagery

Speaker(s)



Sabrina Ricci
AI Ecosystem Coordinator, Φ-lab,
European Space Agency (ESA)

Interested in participating in GeoAI for Good activities ?

- Showcase innovative applications in the GeoAI Discovery Serie
 - Hands-on workshops
 - Geospatial Foundation Models
- Get involved with the ITU GeoAI Challenges!
 - Sponsor, Problem statement owner, Participant