GeoAI Best Practices and Mapping Disaster Resilience

Andrea Manara
International Telecommunication Union

UN GGIM 2025 –side event
The evolving digital landscape

4 August 2025

Agenda

- AI for Good Global Platform
  - Highlight from July 2025 Summit
- GeoAI activities and best practices
  - GeoAI Discovery channel
  - GeoAI Challenges
- Global Initiative on Resilience to Natural Hazards through AI Solutions
- Outlook

AI for Good | AI for Good Global Platform

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

All YEAR, ALWAYS ONLINE

Organizer

53 UN Orgs

Co-convener

AI for Good | AI for Good Global Summit 2025 – Key Highlights

✅ Global Participation

- 11,000+ attendees from 169 countries.
- Focus: **AI governance, skills, and standards**.

✅ AI Governance Dialogue

- Co-chaired by UAE & France → **inclusive AI policies**.
- Co-chairs' summary report calls for AI that bridges innovation, inclusion, and sustainability

✅ Skills for All

- **ITU AI skills coalition**
- Goal: Train **10,000 people** (priority: developing nations).

✅ Standards & Impact

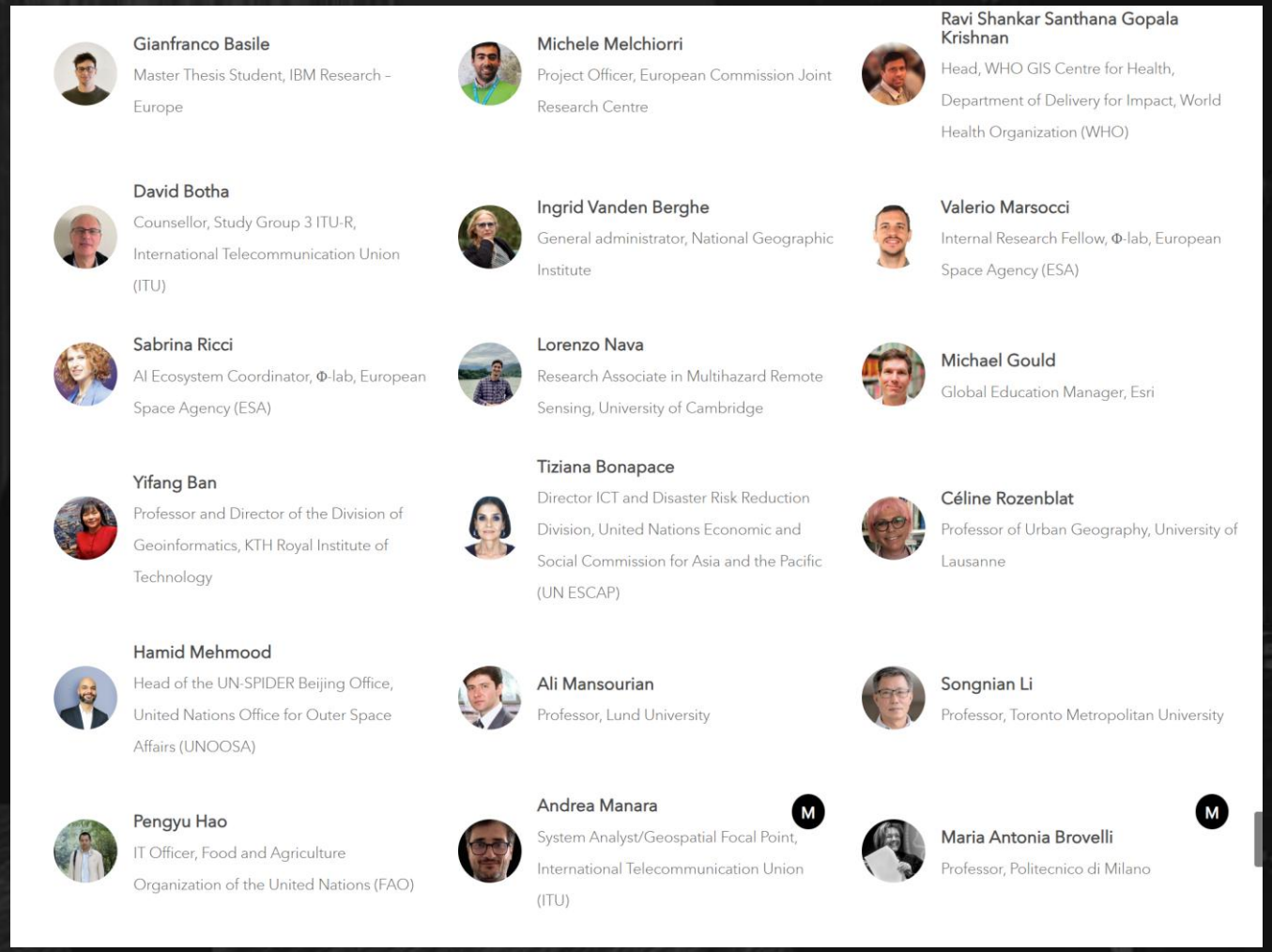
- 🌾 **AI for Food Systems** (with FAO/WFP).
- 🎭 **Deepfake detection standards** (ITU/ISO/IEC).
- 💾 **AI Standards Database** (global collaboration).

AI for Good | AI for Good Global Summit 2025 – Key Highlights

GeoAI workshop
July 9th 14:00 - 17:30

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

- Session 1: GeoAI Applications
- Session 2: Geospatial Foundation Models
- GeoAI Challenges



Gianfranco Basile
Master Thesis Student, IBM Research - Europe

Michele Melchiorri
Project Officer, European Commission Joint Research Centre

Ravi Shankar Santhana Gopala Krishnan
Head, WHO GIS Centre for Health, Department of Delivery for Impact, World Health Organization (WHO)

David Botha
Counsellor, Study Group 3 ITU-R, International Telecommunication Union (ITU)

Ingrid Vanden Berghe
General administrator, National Geographic Institute

Valerio Marsocci
Internal Research Fellow, Φ-lab, European Space Agency (ESA)

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

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

Michael Gould
Global Education Manager, Esri

Yifang Ban
Professor and Director of the Division of Geoinformatics, KTH Royal Institute of Technology

Tiziana Bonapace
Director ICT and Disaster Risk Reduction Division, United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP)

Céline Rozenblat
Professor of Urban Geography, University of Lausanne

Hamid Mehmood
Head of the UN-SPIDER Beijing Office, United Nations Office for Outer Space Affairs (UNOOSA)

Ali Mansourian
Professor, Lund University

Songnian Li
Professor, Toronto Metropolitan University

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

Andrea Manara M
System Analyst/Geospatial Focal Point, International Telecommunication Union (ITU)

Maria Antonia Brovelli M
Professor, Politecnico di Milano

AI for Good | GeoAI activities

GeoAI Discovery

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

Curator: **Maria Antonia Brovelli**
Politecnico di Milano (UN GGIM AN Advisory Board, ISDE Vice President, ISPRS TC IV Vice Pesident)

GeoAI Challenge

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

UN GEOSPATIAL NETWORK
UNITED NATIONS COMMITTEE OF EXPERTS ON GLOBAL GEOSPATIAL INFORMATION MANAGEMENT

UN-GGIM ACADEMIC NETWORK

UN Open GIS INITIATIVE

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 | 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...

+2

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...

+2

Around 40 episodes organized since 2021

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

AI for Good | *Highlight from 2024 Challenges*

AI for Good

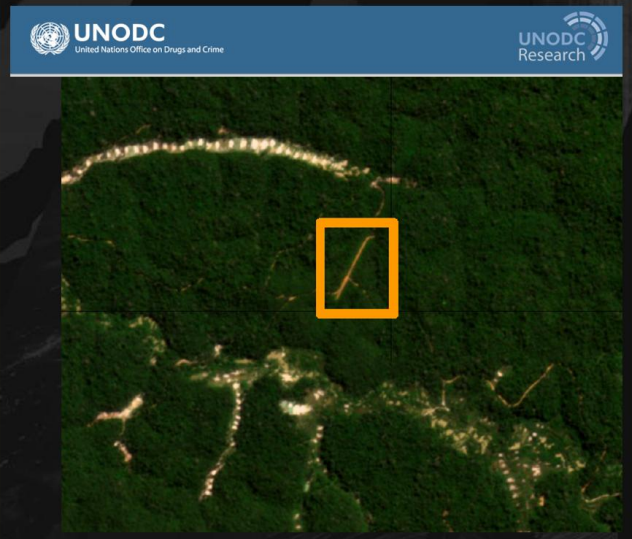
Estimation of ground-level NO_2 concentrations using remote sensing data with machine learning approach

2024 GeoAI Challenge:
380 teams submitting ML solutions

olitecnico di Milano, Dept. o
niversity of Padua, Interdpt

AI for Good

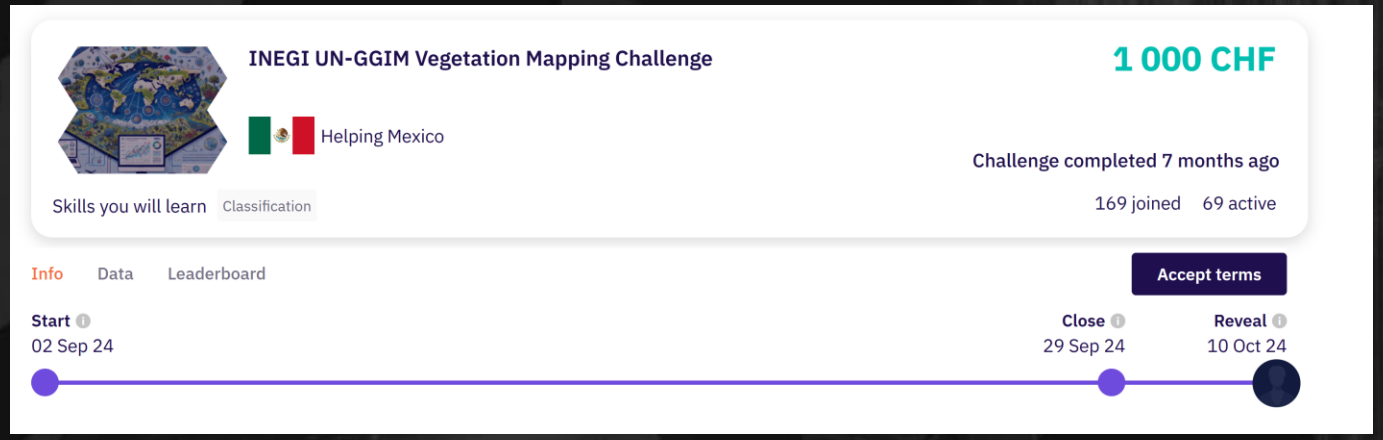
Mapping clandestine runways in the Peruvian Amazon

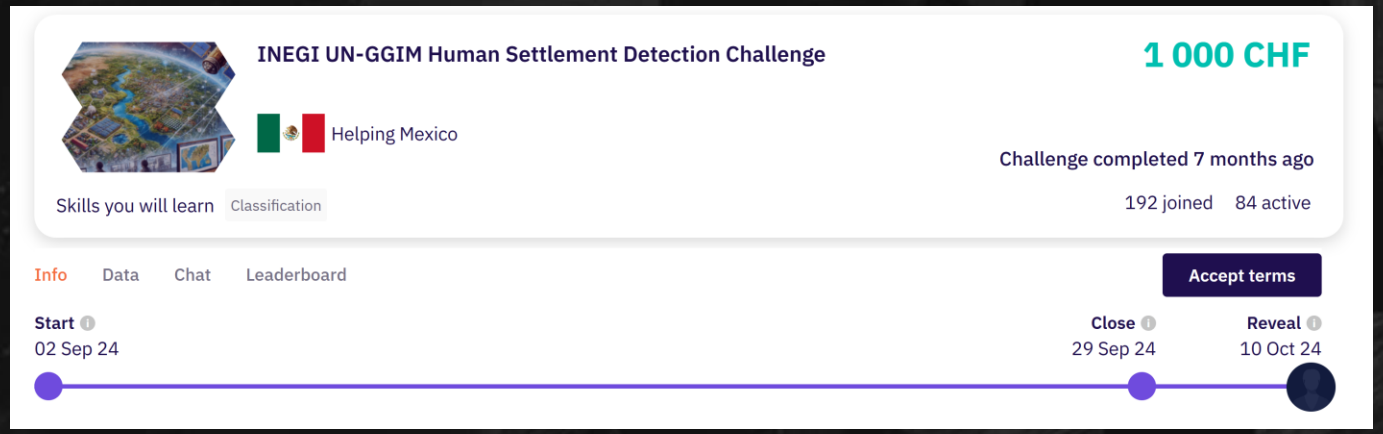


2024 GeoAI Challenge
26 teams submitting ML solutions

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

AI for Good | *Highlight from 2024 Challenges*





UN GGIM **Seventh High-level Forum "Accelerating Implementation: Achieving Resilience"**, Mexico City in October 2024.

Keynote: Building a sustainable future: Innovation, Technology and AI

Mr. Mario Maniewicz, Director
Radiocommunication Sector, ITU

AI for Good

2025 GeoAI challenges

FAO Challenge

GEOAI Challenge for Cropland Mapping in Dry Environments

1 000 CHF

Helping Uzbekistan, Russian Federation

~2 months left

Skills you will learn: Classification, Earth Observation

283 joined 66 active

Info | Data | Chat | Leaderboard | Team | Submissions

Submit

Start	Close	Reveal
02 Jul 25	29 Sep 25	29 Sep 25

Can you develop an accurate and cost-effective method for cropland mapping?

Remote sensing imagery has been widely used for cropland extent classification, but existing products still contain high levels of uncertainty, making them less useful . Machine learning and artificial intelligence can improve the accuracy of crop mapping and land cover classification using time-series satellite imagery. In this challenge, the focus is on cropland mapping in dry regions, where the primary challenge lies in distinguishing cropland from pastures and steppe land.

You are tasked with developing an accurate and cost-effective method for cropland mapping in two test regions (Fergana in Uzbekistan and Orengurg in Russia), both of which present the unique complexities of arid and semi-arid agricultural landscapes.

By participating, researchers and practitioners will contribute to the advancement of global cropland mapping, promoting a more precise and comprehensive understanding of agricultural landscapes.

ITU 160

Focus Group on AI for Natural Disaster Management

ITU/WMO/UNEP Focus Group on AI for Natural Disaster Management (**FG-AI4NDM**) leveraged the ITU ICT expertise with natural disaster expertise from the WMO and UNEP.

Roadmap

Glossary

Technical Report on AI for Communications

Technical Report on AI for Data

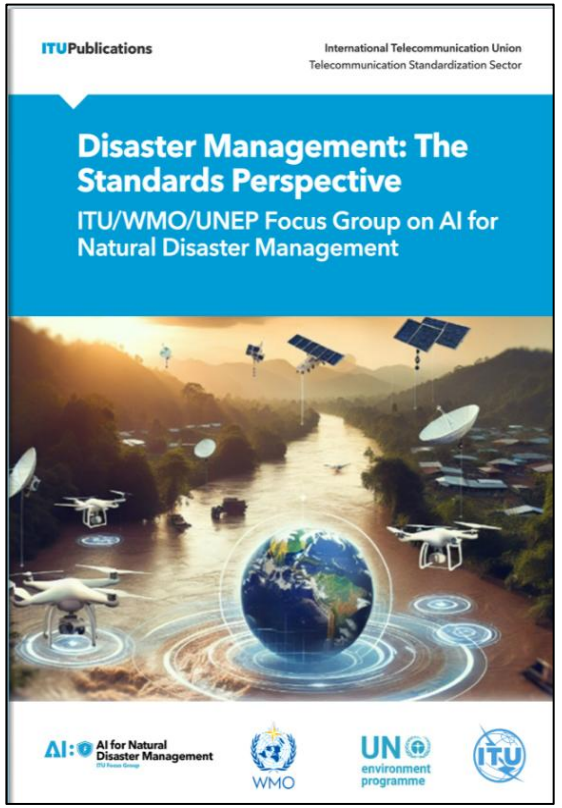
Technical Report on AI for Modelling

Resilience to Natural Hazards

Research

Standards Development

Innovation



More UN agencies have joined as Partners when the Focus Group evolved in the Global Initiative on "Resilience to Natural Hazards through AI Solutions"

Global Initiative on Resilience to Natural Hazards through AI Solutions

Classification for Landslide Detection

1 000 CHF

Under code review

958 joined 305 active

Skills you will learn Classification Earth Observation

Info Data Chat Leaderboard Team Submissions

Get a score

Start 17 Apr 25 | Close 04 Aug 25 | Reveal 04 Aug 25

Can you create a classification model to identify landslides?

Landslides, triggered by natural events like heavy rainfall and earthquakes, pose significant risks to lives, infrastructure, and the environment. Effective monitoring and mapping of landslides are crucial for mitigating these risks, guiding emergency responses, and supporting resilient infrastructure planning.

Using multi-source satellite data, you will work to create an accurate landslide detection model. This model should differentiate landslide-affected areas from unaffected regions, leveraging both optical imagery and Synthetic Aperture Radar (SAR) data. The provided datasets, sourced from Sentinel-1 and Sentinel-2, include RGB and near-infrared bands as well as SAR bands (VV and VH) captured pre- and post-event. These data can reveal landscape changes and offer a unique view of the terrain, combining visual and radar-based insights to detect surface alterations and other indicators of landslides.

While optical data is precise and interpretable, SAR data is invaluable in cloud-covered regions. Combining these datasets can improve detection accuracy, particularly in challenging conditions.

The objective of this challenge is to create a model that effectively leverages SAR for cloud-covered regions while prioritising optical data where available,

Trustworthiness Evaluation

- Data & Model Bias
- Model Transparency
- Approach Reusability
- Sustainability and Efficiency

Outlook

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

Contact: andrea.manara@itu.int, maria.brovelli@polimi.it

Interested in participating in the activities of the Global Initiative on Resilience to Natural Hazards through AI Solutions?

Contact: mythili.menon@itu.int, monique.kuglitsch@hhi.fraunhofer.de