

IRCAI

Scientific excellence, global public dialogue and technology for sustainability, inclusion and equality.

AI for Sustainable Development

School on Applied AI for Sustainable Development | (smr 4210)
Trieste 24.3.2025





IRCAI: Who are we and what do we do?

- **LAUNCH** publicly in March 29 and 30 2021 with **1083 registered participants** from **123 countries** as an ecosystem of research institutions, companies, start-ups and non-profit players.
- Partially founded by the Government of the Republic of Slovenia and has its headquarters at the **Jožef Stefan Institute** in **Ljubljana, Slovenia**.
- Connections to **160 private companies, 76 public entities** (Foundation/ non-profit), **21 public (University); 6 public (Government)**, and **6 Public (NGO)**, helping preparing applications for IRCAIs in other regions (**Morocco, Saudi Arabia, Ghana, New Zealand**)
- IRCAI's director **John Shawe-Taylor** is Chairholder of the UNESCO Chair in Artificial Intelligence within the UCL doing work in AI and acts as the trustee of the Knowledge 4 All foundation doing work in the Global South.

IRCAI VIRTUAL LAUNCH

<https://ircai.org/launch-2021/>

REPUBLIC OF SLOVENIA
MINISTRY OF EDUCATION,
SCIENCE AND SPORT



IRCAI



Seats in committees

- 1 Member of the **Expert Group for the UNESCO Recommendation on the Ethics of AI**, set up by UNESCO Secretariat
- 2 Observer to the **Ad Hoc Committee on Artificial Intelligence (CAHAI)**, founded by the Council of Europe
- 3 Member of the **Expert Group on AI and Data in Education and Training (E03774)**, set up by the European Commission
- 4 Member of the **D4D Hub AI Working Group**

UNESCO projects

- 1 UNESCO AI training programme for **primary school teachers** (ref. OER and AI education)
- 2 UNESCO **AI Public Education Programme** (ref. Network)
- 3 UNESCO report on the **use of AI in SIDS** countries (ref. Network)
- 4 UNESCO report on the **use of open data for the UN Sustainable Development Goals** (ref. Social Bonds and AI)
- 5 UNESCO report and **framework on AI and SDG Innovation** (ref. TOP 100)



INTERNATIONAL RESEARCH CENTRE FOR AI UNDER THE AUSPICES OF UNESCO

www.ircai.org

Policies Innovation

(UNESCO, Council of Europe, OECD, EU, GPAI, National policies, D4D)

Research on consequences of AI

(Legal frameworks, Ethics in AI, Added Value Models, Jobs,...)

Projects addressing global challenges with AI

(Global Ground Truth, Open Education)

Verification programme

(clearing house, mediation verification programme, validation of the ethicality of algorithms and data management)

Financing programme

(Social Impact Bonds, venture capital to finance research and acceleration of start-ups)

Capacity building, Awareness raising

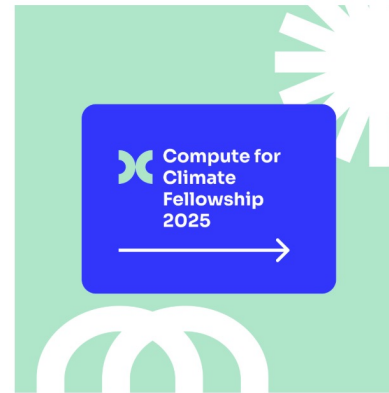
(Journal, AI Olympics, Open education, Events, Formal Educational Programs on AI)

Global Network of AI competences

(NAIXUS, IRCAI backbone network)

Large Open Analytics Infrastructures

(SDG Observatories, Open Libraries)



IRCAI announces Eight New Startups for Compute for Climate Fellowship with AWS Support

Nov 15, 2024 | Announcement



IRCAI Partners with AI in Africa for the AI 4 Water Sustainability Challenge

May 8, 2024 | Events



FOCUSING ON SCIENTIFIC / TECHNOLOGICAL MAJOR CHALLENGES

Focus on scientific or technological major challenges, with the primary goal to reinforce capacity and progress in critical technologies

SPREADING ADVANCED KNOWLEDGE

Building on existing efforts of already existing platforms, networks and projects, the network will develop mechanisms to spread the latest and most advanced knowledge to all the AI-labs in the United Nations five geographical regions: Africa, Americas, Asia and the Pacific, Europe and Central Asia, and the Middle East and prepare the next generation of talent in AI. Such mechanisms will be defined with all network partners

DEVELOPING SYNERGIES AND CROSS-FERTILIZATION

Another objective is also to develop synergies and cross-fertilization between industry and investors in the network of excellence centres, in particular through internships of academic staff (at all levels) in industry, or PhD programmes with industry;

BECOMING A VIRTUAL LABORATORY

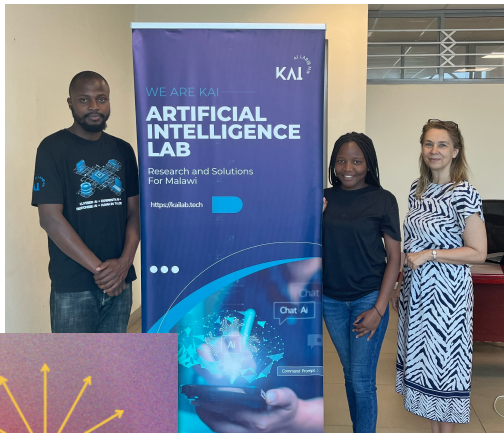
The network will form a common resource and will become a shared facility, as a virtual laboratory offering access to knowledge and expertise and attracting scientists, investors, policymakers and new talents. It should become a reference, creating an easy entry point to AI excellence across the Global South as well and should also be instrumental for its visibility

CREATING A DATA DRIVEN BENCHMARK SYSTEM

Creating a data driven benchmark system for the measurement of SDGs to further create a social impact investment ecosystem for AI research and companies



IRCAI AWARDS

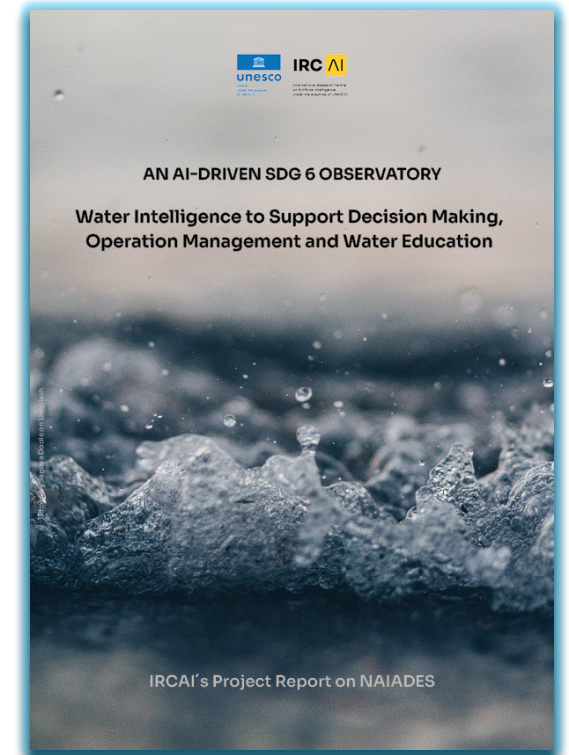


IRCAI JOURNAL



11 event highly visible reports; 2 opinion series reports ; 7 recommendations

IRCAI LIBRARY

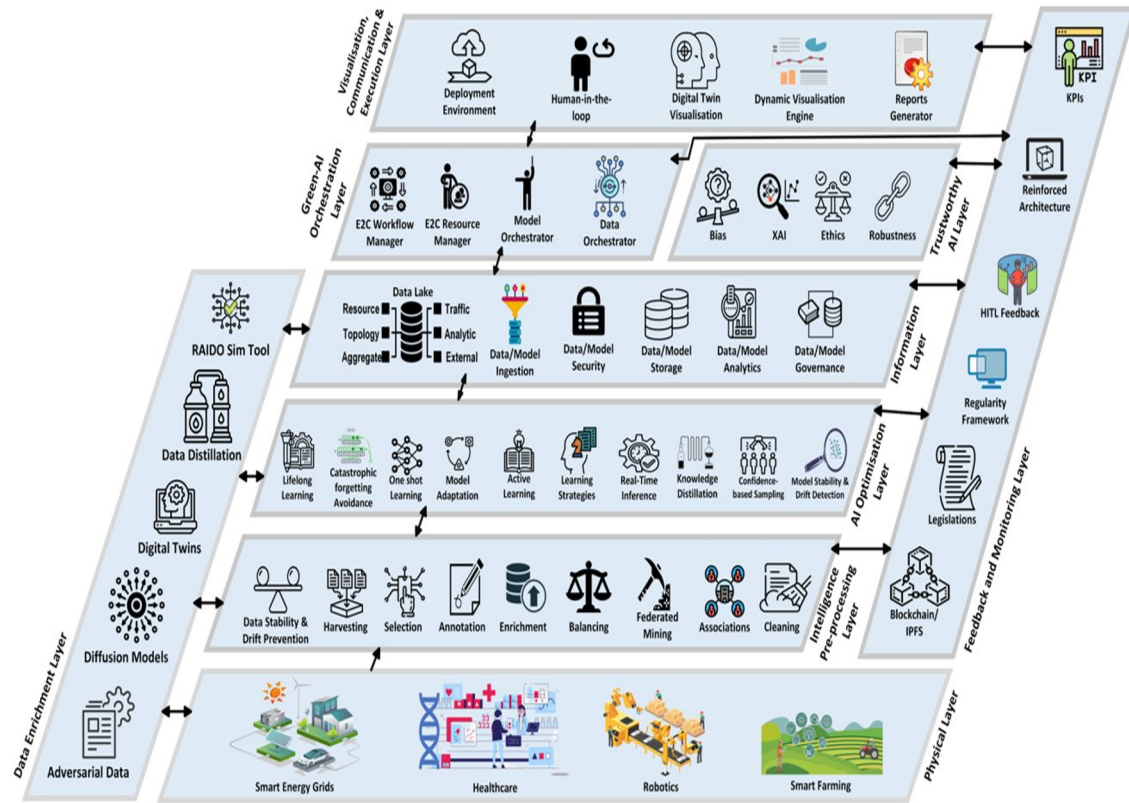


RAIDO

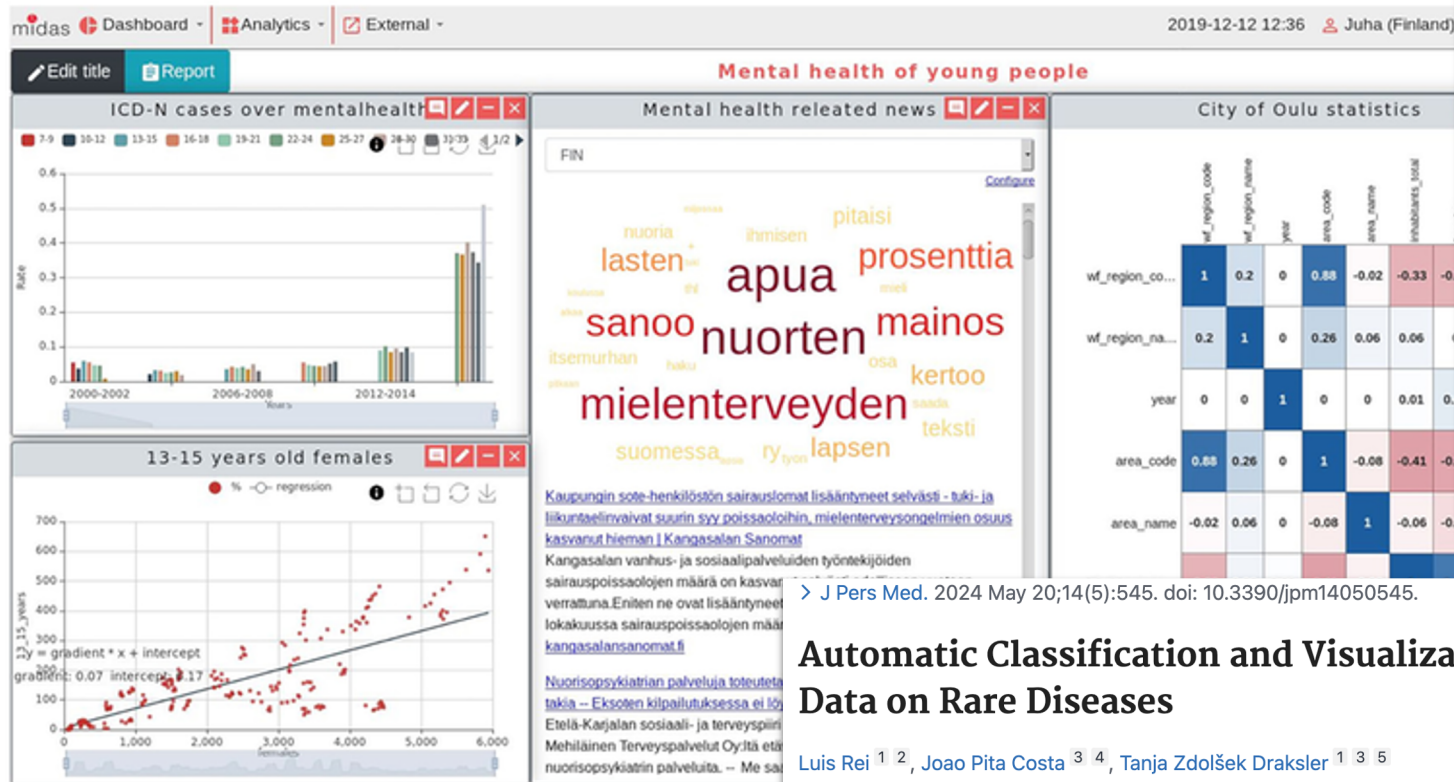
Reliable AI and Data Optimization

An integrated platform for Green and Energy-efficient data and model related operation

raido-project.eu



AI, Big Data and Digital Public Health



Meaningful Big Data Integration for a Global COVID-19 Strategy

Abstract—With the rapid spread of the COVID-19 pandemic, the novel Meaningful Integration of Data Analytics and Services (MIDAS) platform quickly demonstrates its value, relevance and transferability to this new global crisis. The MIDAS platform enables the connection of a large number of isolated heterogeneous data sources, and combine rich datasets including open and social data, ingesting and preparing these for the application of analytics, monitoring and research tools. These platforms will assist public health authorities in: (i) better understanding the disease and its impact; (ii) monitoring the different aspects of the evolution of the pandemic across a diverse range of groups; (iii) contributing to improved resilience against the impacts of this global crisis and (iv) enhancing preparedness for future public health emergencies. The model of governance and ethical review, incorporated and defined within MIDAS, also addresses the complex privacy and ethical issues that the developing pandemic has highlighted, allowing oversight and scrutiny of more and richer data sources by users of the system.

Introduction
The COVID-19 outbreak was declared a Public Health Emergency of International Concern by the World Health Organization (WHO) on 30 January 2020 [35]. With its rapid expansion, health stakeholders are keen to find technologies to monitor and combat the spread and impact of the disease. Along with this, the world has seen the multiplication of surveillance efforts to monitor the epidemic by official global health agencies such as the WHO and the European Centre for Disease Control (ECDC), businesses

Authors: Joao Pita Costa, Marko Grobelnik, Flavio Furrer, and Luka Stopar (Quintelligence & Intel Stefan Institute, SLOVENIA); Gerko Egelme (Wormtech & Biodiverstia, SPAIN); Scott Fischhaber (Analytics Engines, UK); Piotr Doliwoda (IBM, IRELAND); DeMie Rankin, Jonathan Wallace, Michaela Black, Raymond Bond, and Maurice Mulvenna (Ulster University, UK); Dale Weston (Public Health England, UK); Paul Carlin (Open University, UK); Roberto Bilbao (BOIS, SPAIN); Gerasia Nikolici, Xi Shi, and Bart De Moor (KU Leuven, BELGIUM); Minna Pikkariainen and Jarmo Pääkkönen (University of Oulu, FINLAND); Anthony Staines, Regina Connolly, and Paul Davis (Dublin City University, IRELAND).

> J Pers Med. 2024 May 20;14(5):545. doi: 10.3390/jpm14050545.

Automatic Classification and Visualization of Text Data on Rare Diseases

Luis Rei ^{1 2}, Joao Pita Costa ^{3 4}, Tanja Zdolšek Draksler ^{1 3 5}

Affiliations + expand

PMID: 38793127 PMCID: PMC11121901 DOI: 10.3390/jpm14050545



AI Impact on Sustainable development



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OPINION - How can Türkiye make Developme
Wed Jul 10 2024, 11:00

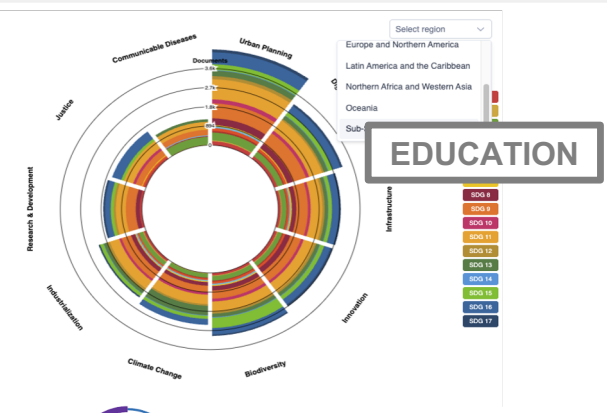
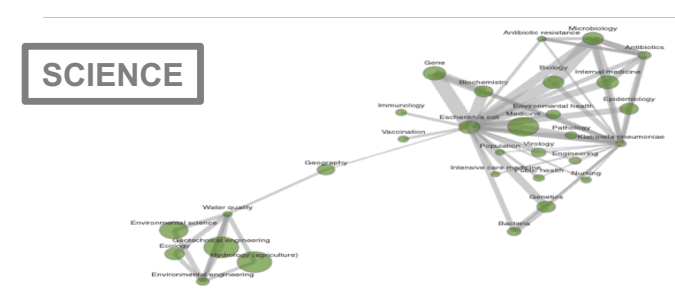
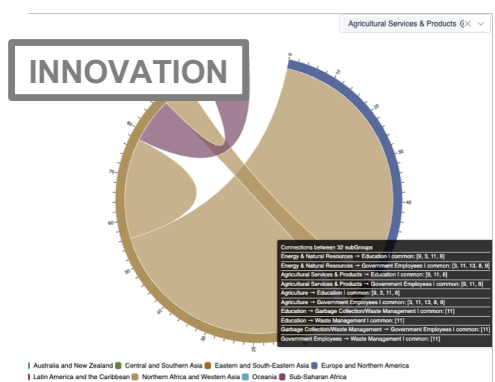
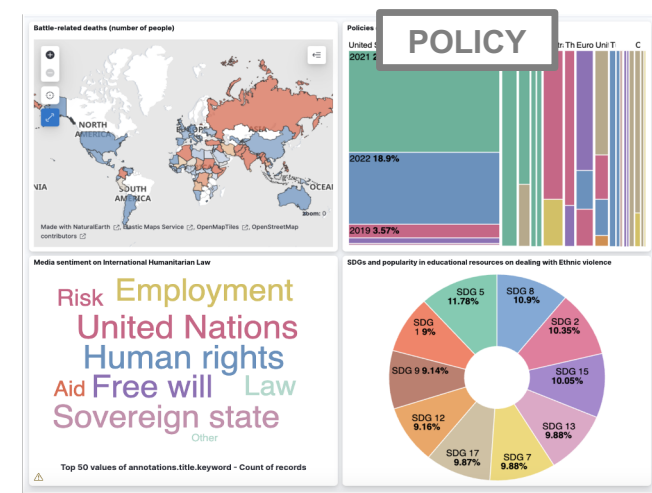
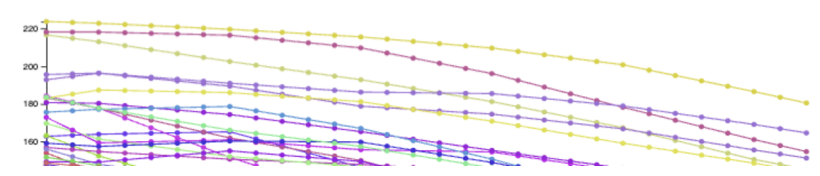
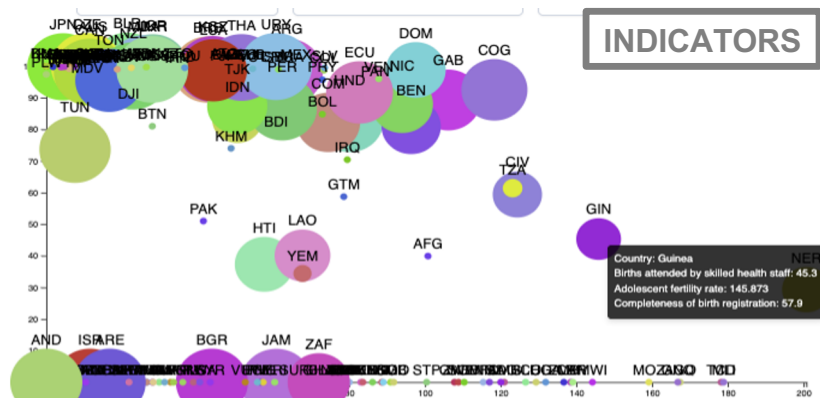
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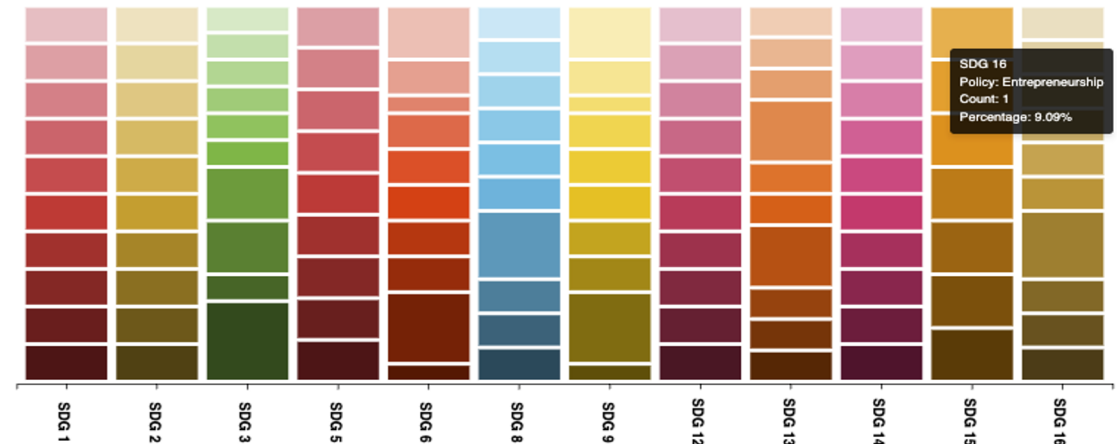
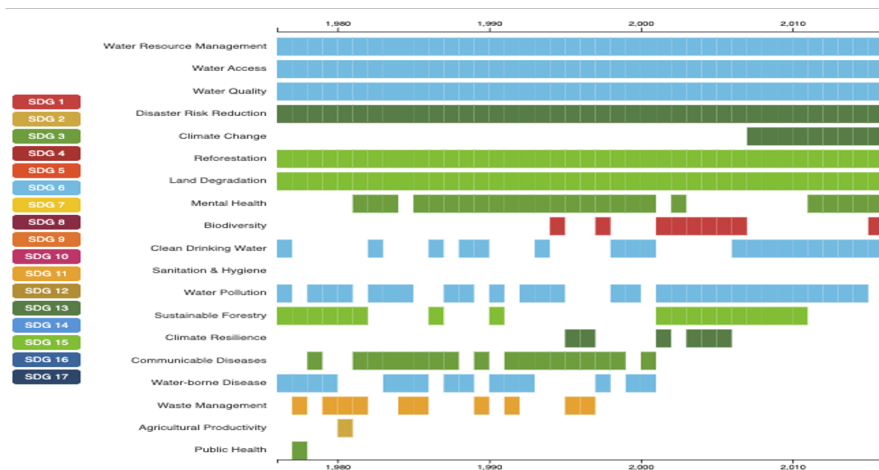
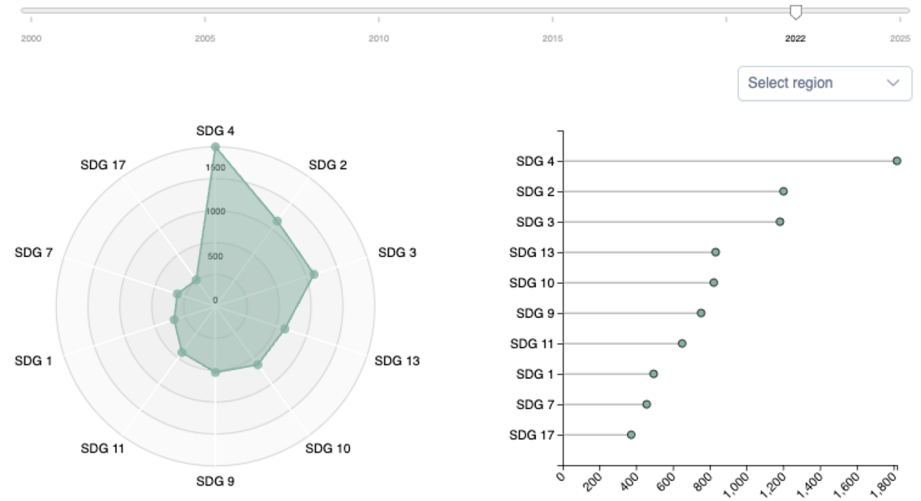
LG USA RENEWS PARTNERSHIP WITH TENNESSEE
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Virtusa and Quality Clouds Forge Strateg



AI4GOV: Trusted AI for Transparent Public Governance fostering Democratic Values

- ★ Identify the most prominent trends in published policies in source language in the context of the existing legal and regulatory landscape, exploring the data sourced worldwide
- ★ Access the dataset of the local policies and regulations to explore the progress of SDG priorities allowing for a reasonable comparison with areas with similar challenges.



Connecting Rare Disease Communities

There are more than 7,000 rare diseases (80% of which are genetic) and new ones are being identified all the time. Rare diseases affect a total of more than 400 million people in the world (30 million people in the EU). IDefine Europe focus neurodevelopmental disorder (NDDs) and their occurrence in global media news, social media, and scientific publications.



idefine-europe.org



Recommendation 7: Data used to its maximum to improve the health and well-being of people living with a rare disease.

www.rare2030.eu/recommendations

MONITORING - ABOUT

RARE DISEASES OBSERVATORY

There are over 7000 rare diseases, and the majority are under researched. Estimated 400 million people around the world have a rare disease, but only 5% of rare diseases have a chance of treatment. That is why rare diseases need to be researched.

The Rare Diseases Observatory enables easy monitoring of rare diseases. By combining different global data sources, we provide the information and knowledge needed to empower all: patients, researchers and clinicians. Our initial focus is on rare neurodevelopmental disorders (NDDs).

WE ARE MONITORING RARE DISEASES

THROUGH DIFFERENT DATA SOURCES & INDICATORS

RARE DISEASES IN GLOBAL NEWS
Monitoring rare diseases in global news media.

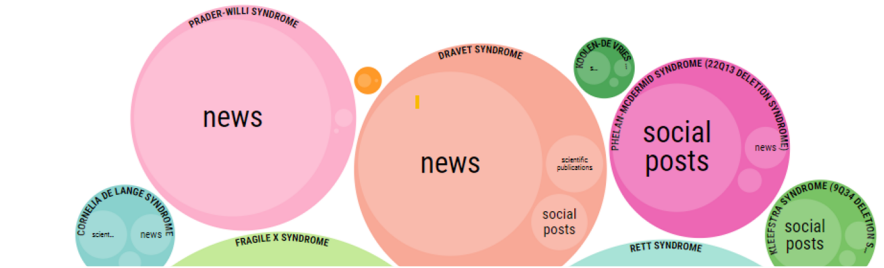
RARE DISEASES ON SOCIAL MEDIA
Monitoring rare diseases on social media (Twitter).

RARE DISEASES IN SCIENTIFIC PUBLICATION
Monitoring rare diseases in scientific publications.

RARE DISEASES AND GENE THERAPY
Monitoring rare diseases in relation to gene therapy, based on different data sources.

RARE DISEASES AND ORPHAN DRUGS
Monitoring rare diseases in relation to orphan drugs, based on different data sources.

<https://rarediseases.ijs.si/>



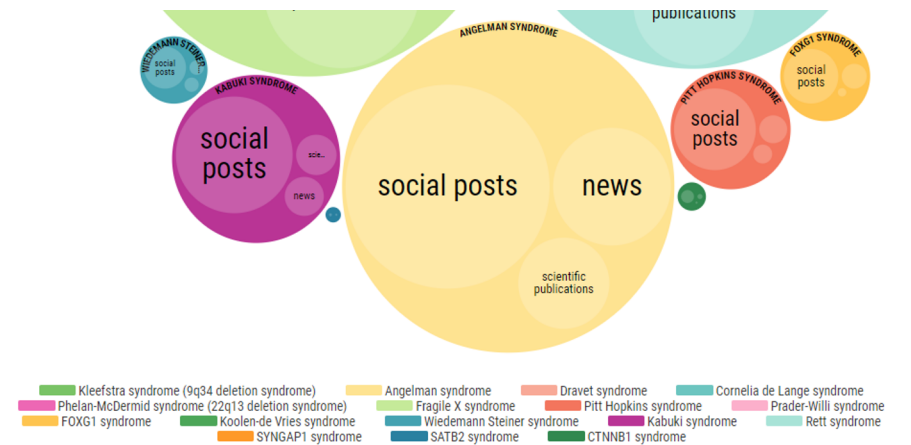
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Good Practices in Water Sustainability

The water sector is facing rapid development in the direction of the smart digitalisation of resources, much motivated and supported by the UN global initiative of the Sustainable Development Goal 6. In that context, the efforts to address the specific challenges related to water management data and priorities multiply globally.

NAIADES WATER OBSERVATORY

ABOUT

FAQ

MONITORING WATER RELATED EVENTS TO EXPLORE RELEVANT WATER ISSUES

Enabling insights into water related issues through data analysis and AI. Built for water experts and the general public.

ABOUT

EXPLORE WATER EVENTS THROUGH AVAILABLE TOOLS



INDICATORS



MEDIA



RESEARCH



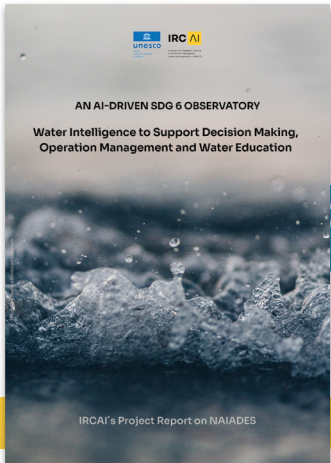
RESOURCES

is received funding from the European Union's research and innovation program under grant 820985

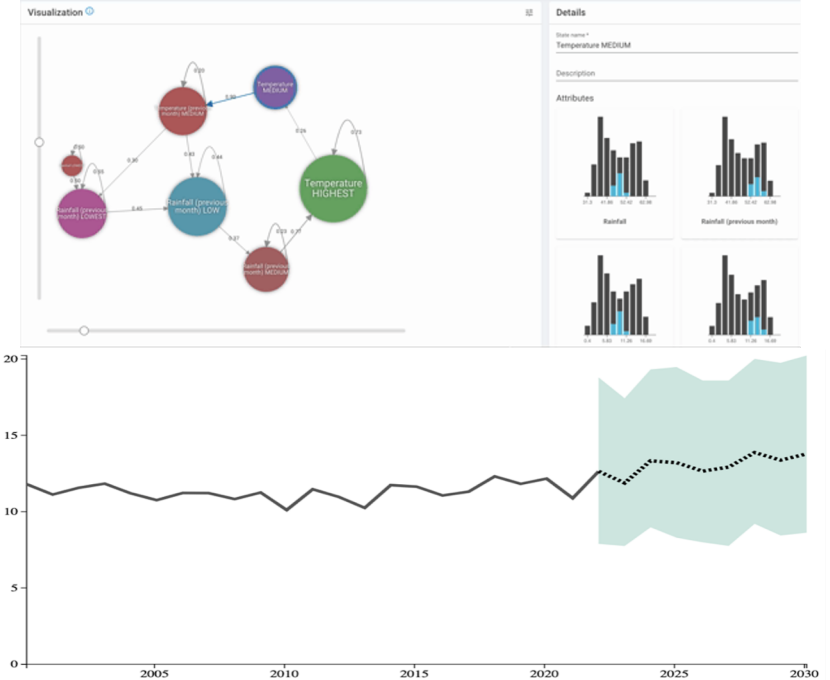
Supported by **eventregistry**

Jozef Stefan Institut Ljubljana, Slovenia

<https://naiades.ircai.org/>



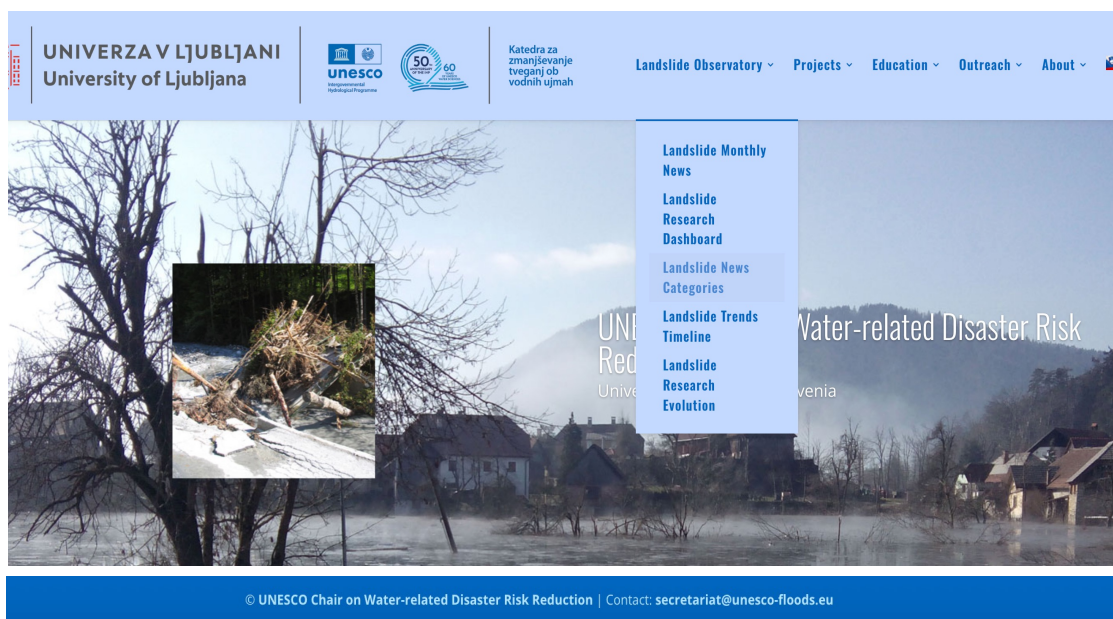
IRCAI's Project Report on NAIADES



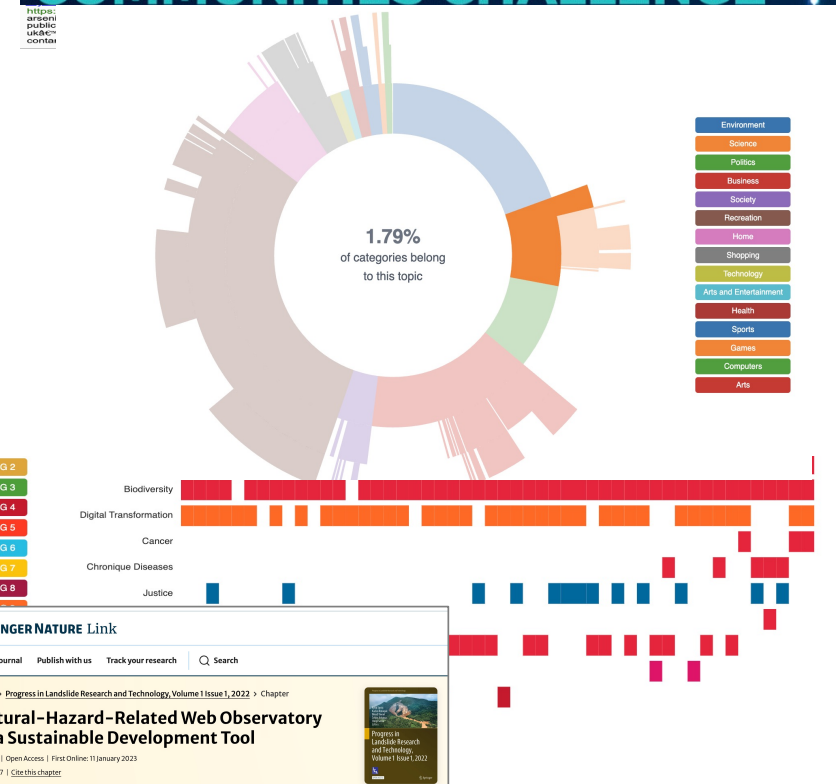
International Research Centre of Artificial Intelligence under the auspices of UNESCO

Disaster Risk Reduction & Landslides

The Landslide Observatory is developed to provide a multifaceted view on landslide-related information worldwide. It includes data from daily multilingual news and published science, as well as yearly ingested statistical indicators, AI policies and open education resources.



<https://www.unesco-floods.eu/>



Multilingual Open Education Resources

This Portal aims to support knowledge exchange and collaboration on the activities of the OER Dynamic Coalition in the framework of the 2019 UNESCO Recommendation on OER. The principles of openness, accessibility and multilingualism, reflected in the UNESCO Recommendation on OER are key to the exchanges on this Portal.

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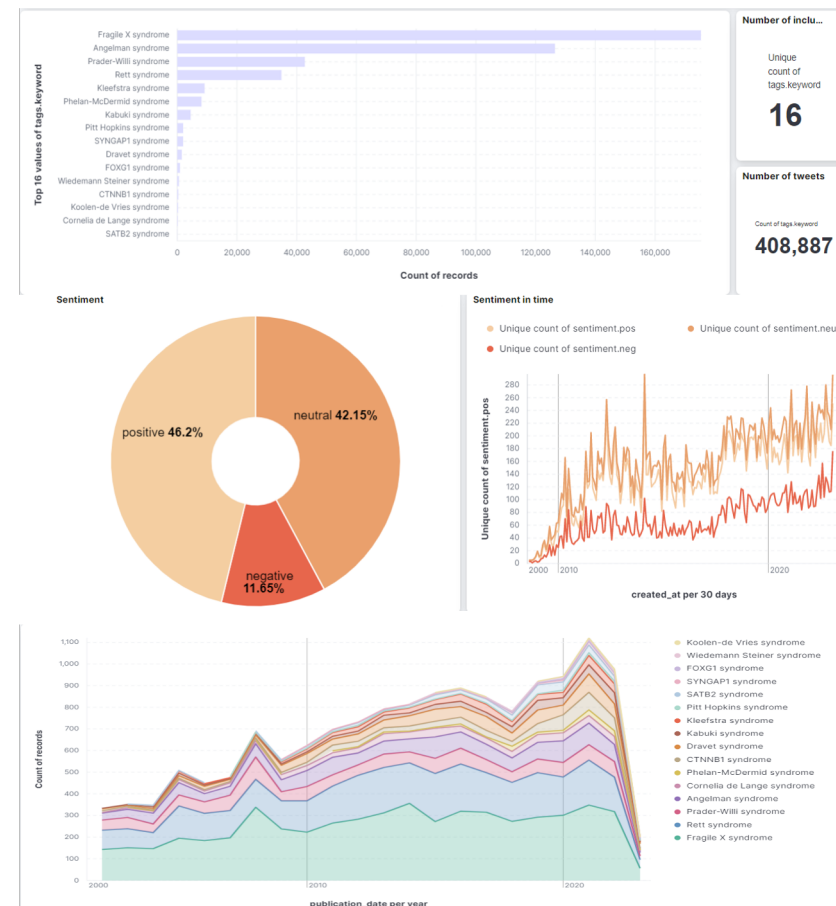
Our mission is clear: to support the implementation of the UNESCO 2019 Recommendation on OER. Through advocacy, knowledge sharing, and capacity development, we empower stakeholders across all action areas outlined in the Recommendation, particularly Members States and institutions. But our ultimate goal is even greater – to unleash the potential of OER for digital learning and ensure universal access to information for all by supporting and providing stakeholders with specific tools in order to help them implement the UNESCO Recommendation on OER.

The main objectives of the UNESCO OER Dynamic Coalition are to:

On this page

- UNESCO Open Educational Resources (OER) Dynamic Coalition Portal
- What is the 2019 UNESCO Recommendation on OER?
- Why is the OER Recommendation important?
- Who we are
- What we Do?

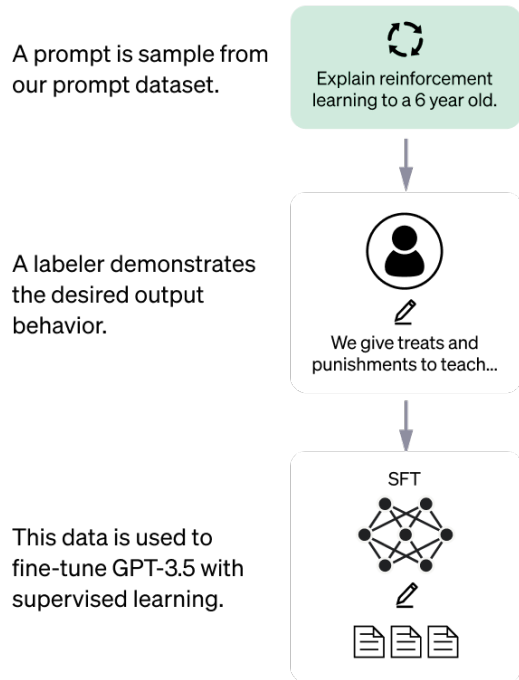
<https://oerdynamiccoalition.org/observatory>



How does a Large Lang Model Wors?

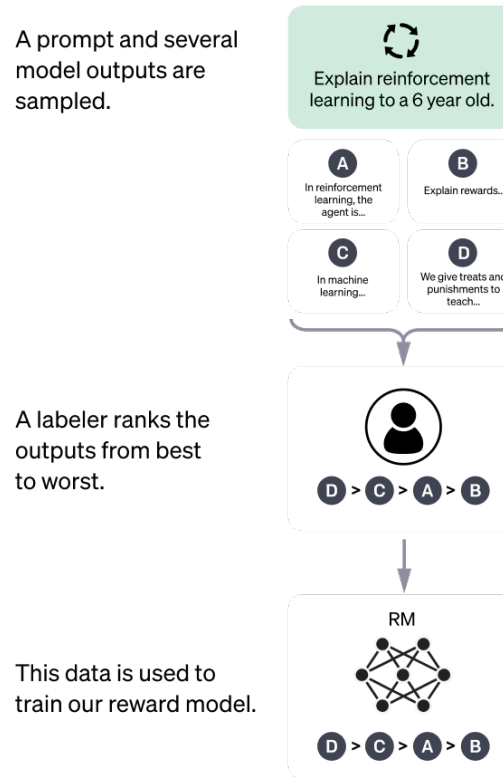
Step 1

Collect demonstration data and train a supervised policy.



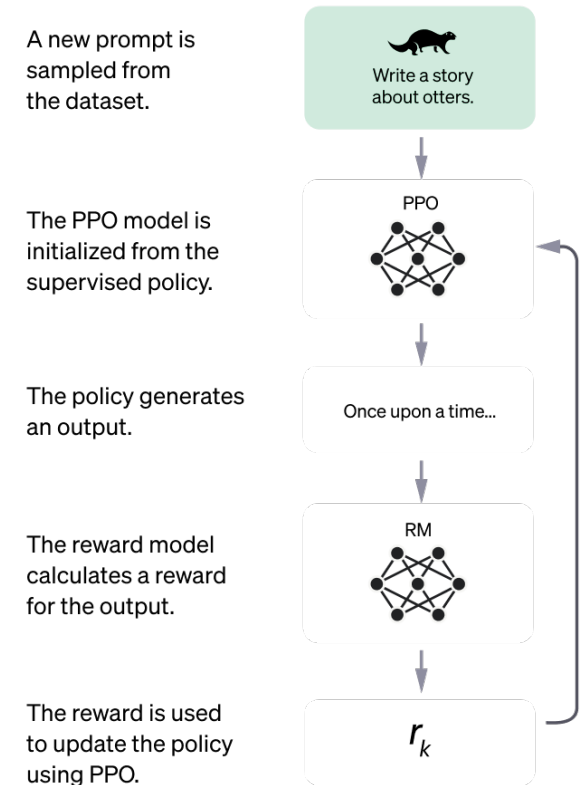
Step 2

Collect comparison data and train a reward model.



Step 3

Optimize a policy against the reward model using the PPO reinforcement learning algorithm.





INDICATORS

Global indicators capturing progress on SDGs



MEDIA

Worldwide news on over 60+ languages worldwide



SCIENCE

Peer-reviewed scientific articles and patents



POLICY

Legal and regulatory landscape on AI and Sustainability



EDUCATION

A range of multilingual open education resources



INNOVATION

AI & Sustainability Entrepreneurship

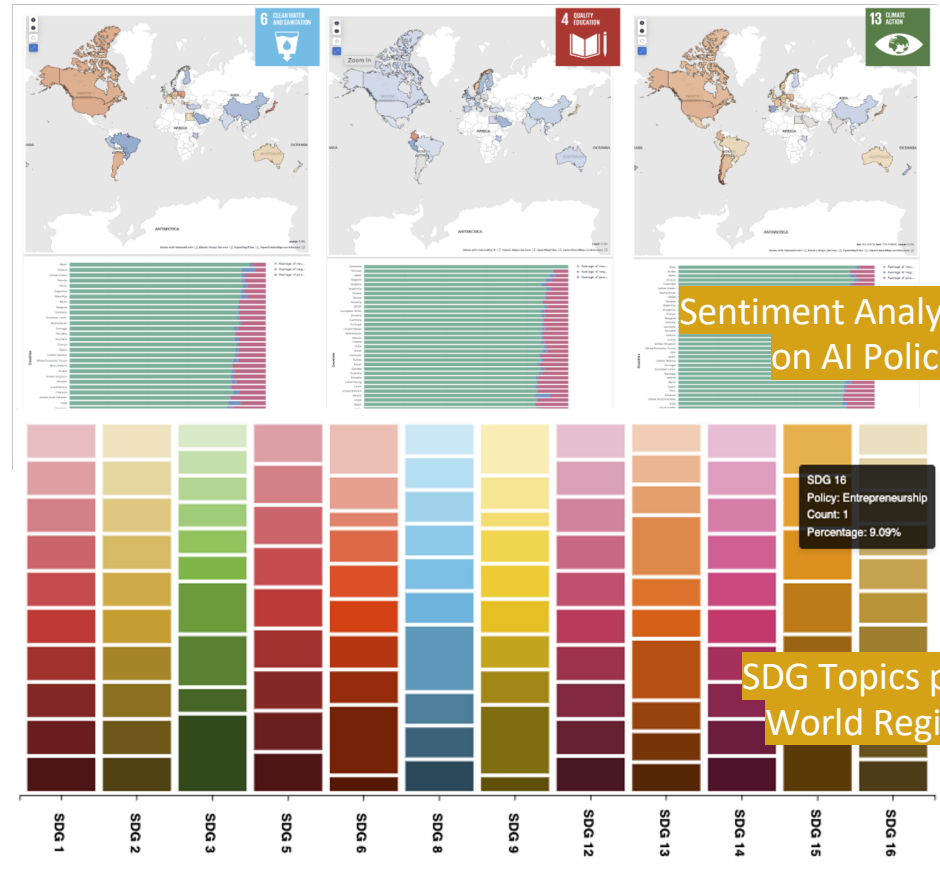
HIGHLIGHT

NEWS

REPORT

DASHBOARD

BIAS BOARD



Contributing to
achieve in 2030
the Sustainable
Development
Goals with AI
as established
by UN in 2015

IRCAI SDG OBSERVATORY

Welcome to IRCAI's Observatory for Artificial Intelligence and the Sustainable Development Goals. Through interactive data visualisation of large open datasets you will be able to get to know more on the impact of AI in each of the SDGs and to explore through AI the insight in them.

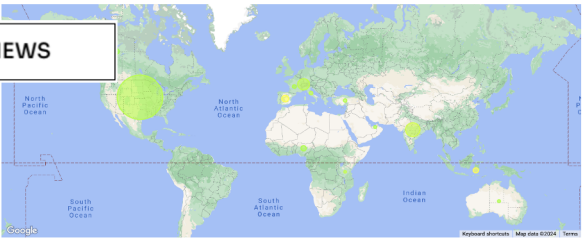


WORK IN PROGRESS

<https://sdg-observatory.ircai.org/>

Observing SDGs from an AI perspective with Open Data, available to public and addressing Specific Needs and Priorities

NEWS



Canarias24Horas.com - Tenerife será sed
Wed Jul 10 2024, 11:33

OPINION - How can Türkiye make Developme
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Features Invest in fertil
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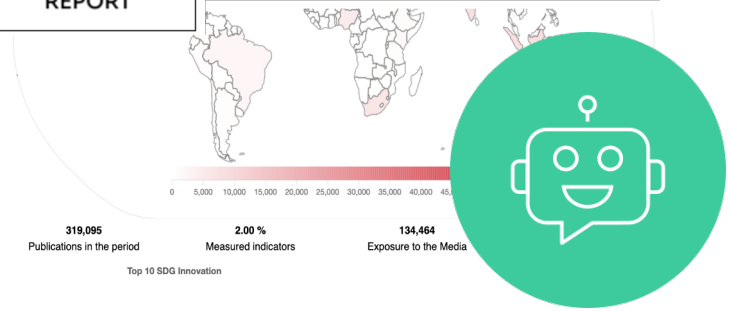
Trilateral Powerhouse: India, Indonesia,
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LG USA RENEWS PARTNERSHIP WITH TENNESSEE
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Virtusa and Quality Clouds Forge Strateg




REPORT

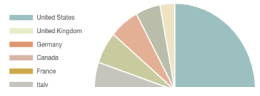


319,095 Publications in the period


2.00 % Measured indicators

134,464 Exposure to the Media

Top 10 SDG Innovation

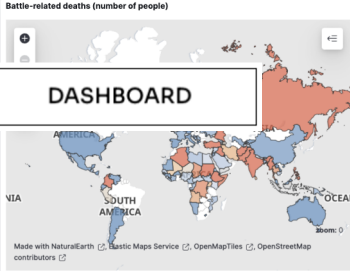


SDG News Exposure

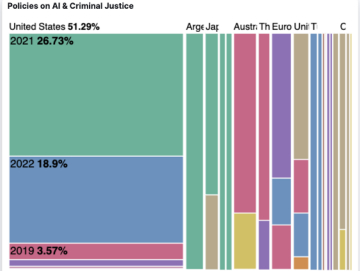


DASHBOARD

Battle-related deaths (number of people)



Policies on AI & Criminal Justice

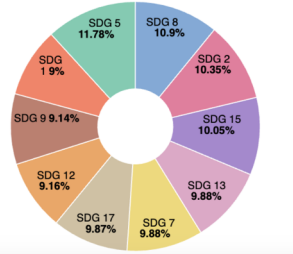


Media sentiment on International Humanitarian Law

Risk Employment
United Nations
Human rights
Aid Free will Law
Sovereign state
Other

Top 50 values of annotations.title.keyword - Count of records

SDGs and popularity in educational resources on dealing with Ethnic violence



Ingesting heterogeneous data to provide a range of perspectives on the impact of AI in the progress of SDGs



INDICATORS

Global indicators capturing progress on SDGs, used to guide findings and explore causality relations



MEDIA

Worldwide news on over 60+ languages worldwide used to assess the coverage of the media on AI impact



SCIENCE

Peer-reviewed scientific articles covering knowledge used to investigate research topics and good practices



POLICY

Legal and regulatory landscape on AI and Sustainability used to monitor perspectives on the use of AI



EDUCATION

A range of multilingual open education resources used to facilitate the education for AI and SDGs



INNOVATION

Entrepreneurship ecosystems focusing AI & Sustainability used to ease collaboration, ideation and capacity building



Exploring the interoperability between the perspectives of different data sources

HIGHLIGHT

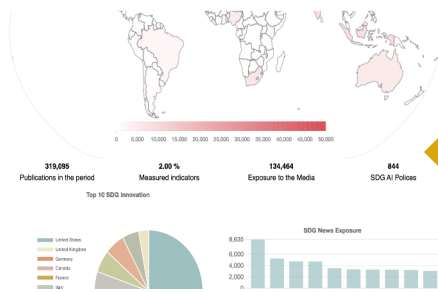
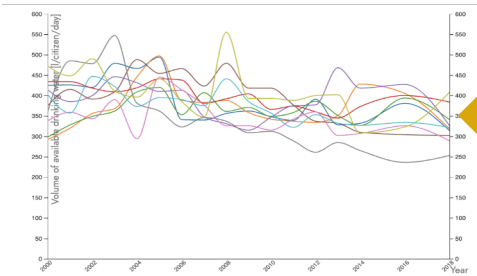
NEWS

REPORT

DASHBOARD

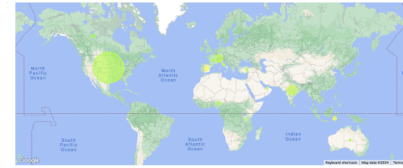
BIAS BOARD

Indicators



Policies

News



Canatan24.com - Tenfile seri sed
 OPINION - How can Turkey make Developme
 Features Invest in ferti
 One Health Approach Can Help Ease Climat
 Trilateral Powerhouse: India, Indonesia,
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 Virtues and Quality Clouds Forge

Search interface for news articles with filters for 'Topic' and 'Start year'.

- (3) Vietnam food death toll rises to 23 as storm Norelga looms
- (4) Progress in climate risk could be a bit of an over
- (4) Southeast Asia food deaths near 40 as new storm approaches
- (4) Southeast Asia food deaths near 40 - C&A
- (1) Study of Socio-Characteristics Downstream of Tarbela-Shikohi Circular Canals

Research

INDICATORS

MEDIA

SCIENCE

POLICY

EDUCATION

INNOVATION

Support
Community
Priorities

Explore
Worldwide
Practices



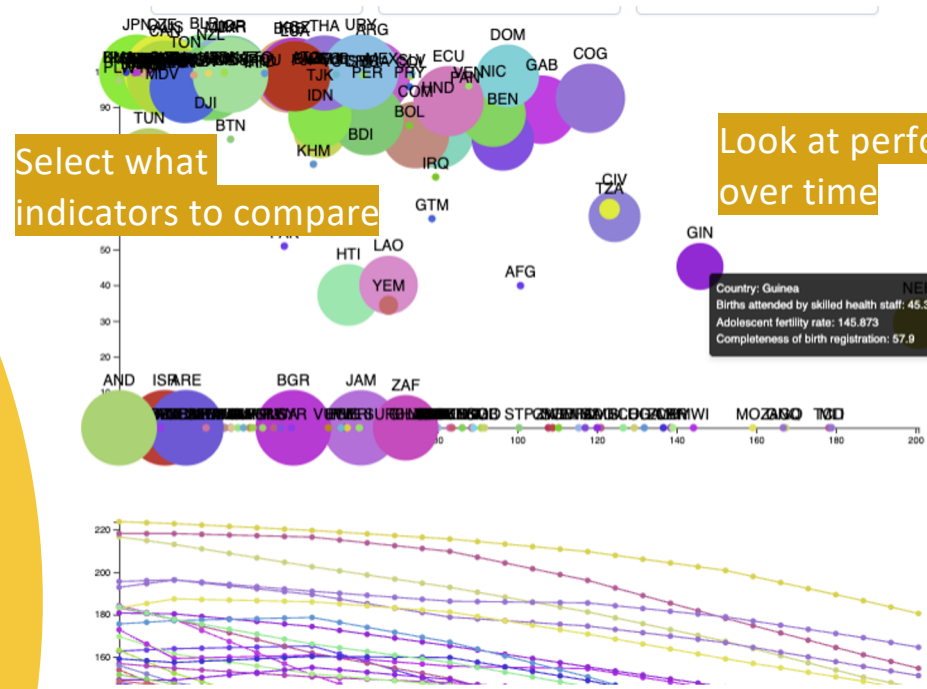


Climate Change & Carbon Emissions

Put your SDG 13 progress into context by Interacting with Statistical Indicators

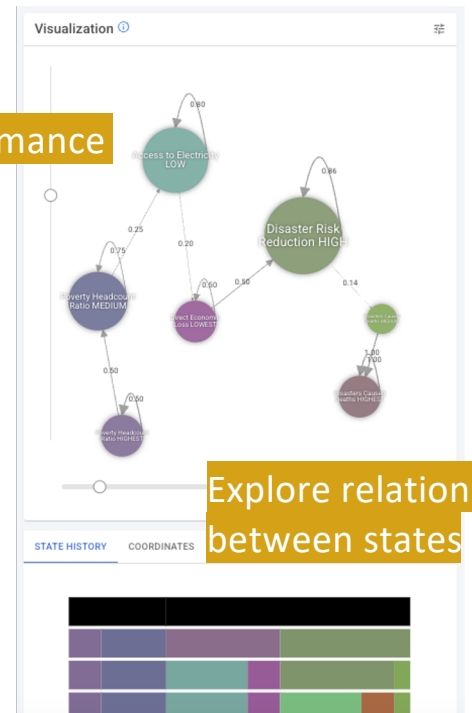


AIDAN O'SULLIVAN
Associate Professor in Energy and AI at UCL, PC Chair in AI and Climate Change



Select what indicators to compare

Look at performance over time



Explore relation between states

- ★ Through **interactive data visualization** you can compare progress on specific indicators (e.g. water stress or usage to citizens, industry and agriculture) between countries and regions.
- ★ Obtain data-driven insights from the data ingested in the system to support **evidence-based policy-making** for water optimization evaluating in real-time the Sustainable Development Goal 13 items.



IRCAI's Observatory has been exploring the potential of AI in estimating the behavior of water resources and disasters in the next decade



SDG 2 Sustainable Agriculture & Food Security

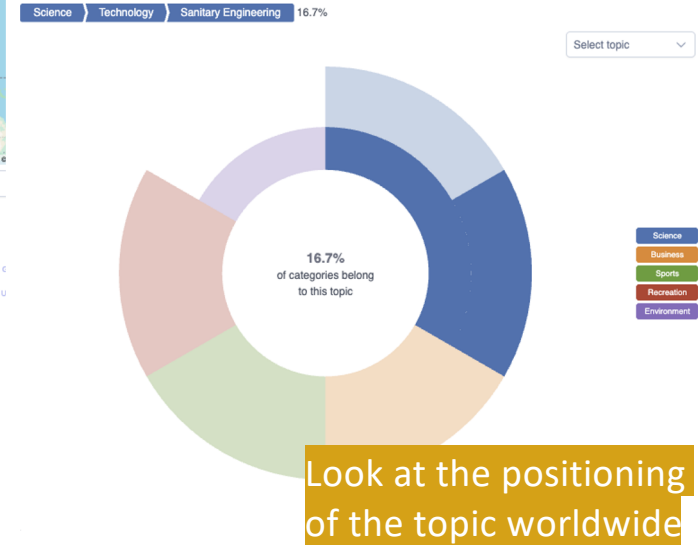
Exploring news and social media to plan for AI and Sustainable Agriculture and how people feel about it



BOLANLE OLADEJO
University of Ibadan,
Nigeria

eventregistry.org

Analyse the news on over **60+** Languages



Look at the positioning of the topic worldwide

★ **Extract best practices** on, e.g. water reuse or extreme water events (e.g. floods and landslide) from millions of worldwide multilingual news to learn from similar cases how to solve SDG2-related problems.

★ Access **causal relations and alerts from social media** through our dashboard configured to the KPIs, priorities and scenarios that are most relevant for the national and private strategy



IRCAI's Observatory has identified 48 news events on AI and Malawi this year across more than 1703 news articles last year

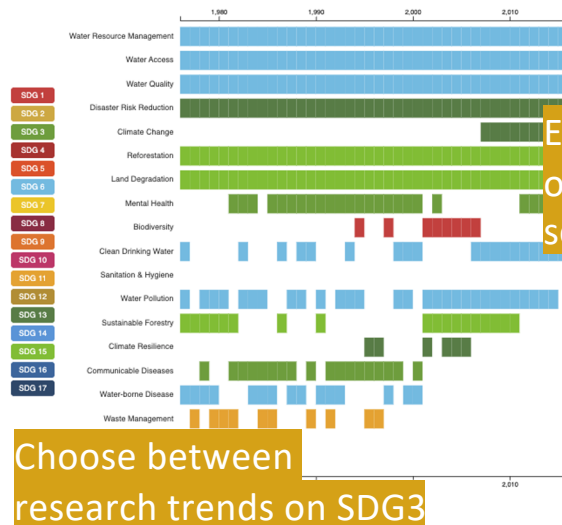


Clean Energy & Resource Efficiency

Fast Access to Science & Technology for Clean Energy & Resource Efficiency

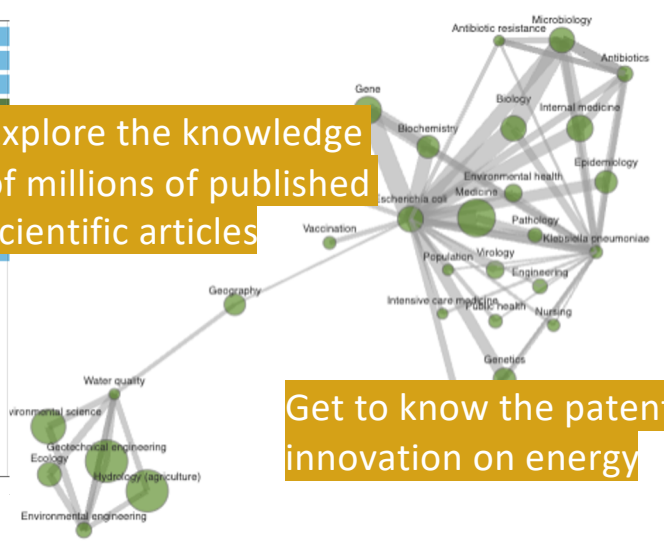


RICARDO VINUESA
KTH Royal Institute of Technology



Choose between research trends on SDG3

Explore the knowledge of millions of published scientific articles



Get to know the patented innovation on energy

- ★ Identify the most **prominent SDG trends from insights** on the known science (e.g. on renewable energy) exploring the Microsoft Academic Graph (with over 126M published articles)
- ★ Access the dataset of the **well-known patent search engine** to explore patented technology leading to innovation in energy efficiency, and how to find a better fit solution

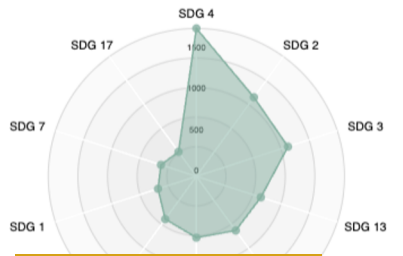


IRCAI's Observatory can provide us with the worldwide trends on applied AI technologies and methodologies

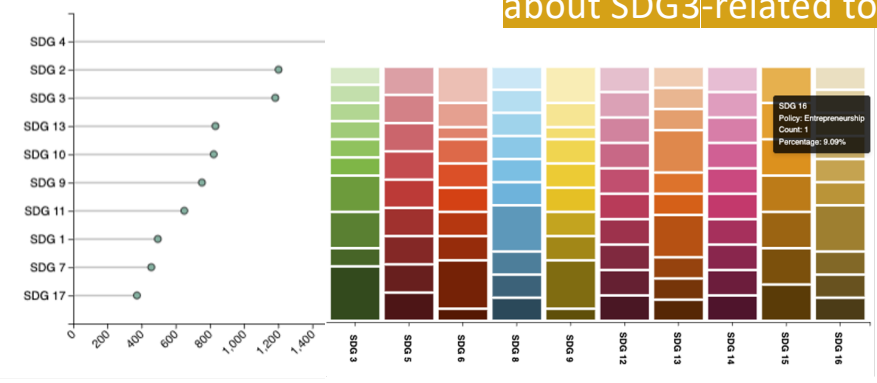


Health & Well Being

Explore Published Policies on AI and SDGs, in the Context of the Legal and Regulatory Landscape



Explore the topics related to the legal and regulatory landscape



Review the published legislation and policies about SDG3-related topics

- ★ Identify the most **prominent trends in published health policies in source language** in the context of the existing legal and regulatory landscape, exploring the data sourced worldwide
- ★ Access the dataset of the **local health & AI policies and regulations** to explore the progress of SDG3 priorities allowing for a reasonable comparison with areas with similar challenges.



DELMIRO FERNANDEZ-REYES
Professor of Biomedical Computing at UCL, PC Chair in AI and Healthcare



IRCAI's Observatory can provide us with the worldwide policies on SDG topics and related standards



Urban
Development &
Smart Cities

Boost Innovation & Entrepreneurship on Smart and Sustainable Cities & Communities

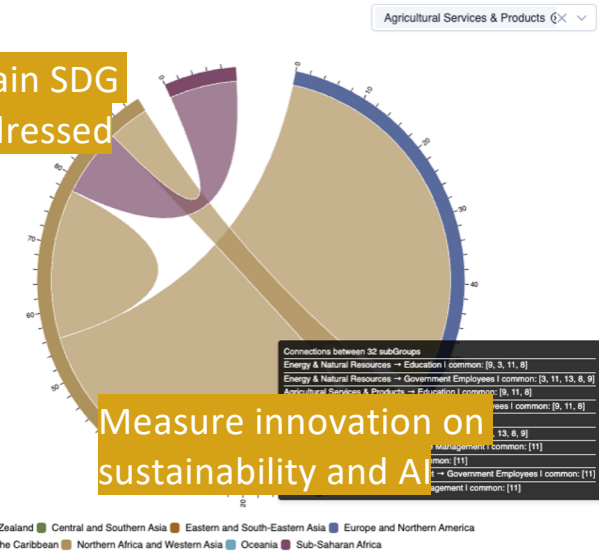


JAMES HODSON
Chief Executive Officer, AI
for Good Foundation



Discover the projects with focus on the different water-related topics

Explore the main SDG challenges addressed



Measure innovation on sustainability and AI

- Extend your **business and research network** through a worldwide community of innovators and entrepreneurs working on AI to boost progress on Sustainable Development Goal 11
- Expose your results and find common points of interest through the **Top 100 AI for Smart Cities** and related initiatives, building together a better future through AI



IRCAI's Observatory helps users to extend their business and research network across the globe over different initiatives

SDG 12



Waste Management & Circular Economy

Educate for SDG12-related Capabilities, and Build the Professionals of the Future



MITJA JERMOL
UNESCO Chair on Open Technologies for OER and Open Learning, PC Chair in AI and Circular Economy

videolectures.net

Exchange ideas. Share knowledge.

Access the AI recommendation of resources

Explore thousands of educational resources

Overview the different trends in the available educational materials

- ★ Get the most of **thousands of insightful learning materials** curated by experts at the UNESCO-awarded Videolectures Open Education platform
- ★ Empower the staff and the general public with the **best practices and knowledge of domain experts** that will lead to the improvement of capabilities through new methodologies and tools



IRCAI's Observatory helps users to find the most relevant domain-specific educational resources for their immediate needs

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14 - 16 APRIL 2025 MARRAKECH

THE AI FOR SUSTAINABLE AFRICAN CITIES AND COMMUNITIES CHALLENGE

is driving innovation to create
SMARTER more resilient cities
across Africa.

AI will be key in solving urban challenges
such as climate change, resource
management, and social inclusion



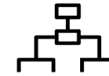
1. Science Knowledge Extraction for Good Practices



2. Data Visualization Narratives on Smart Water



3. Appropriate application of LLMs



4. SDG6-focused classifiers



5. Early detection of floods based on social media



6. Looking for trends with AI



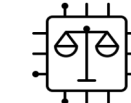
7. Automated sentiment analysis on media



8. Causality analysis on water topics from social media



9. Analysis of waterborne disease on scientific articles



10. Bias, Ethics & Responsible AI





**International Research Centre on Artificial Intelligence
under the auspices of UNESCO (Category II)**
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