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Science Diplomacy Alert

A fortnightly newsletter on S&T, Science Policy and Diplomacy

AI, Democracy and Human Rights: Examining the Significance of the Council of Europe's AI Convention

Major global leaders including the USA, EU, UK and Israel have recently signed the Council of Europe Convention on AI, human rights and democracy. Anupama Vijayakumar writes on what this development means for global AI governance. Continued on Page 3.

SCIENCE POLICY & DIPLOMACY

International S&T Cooperation

Estonia Becomes First Baltic State to Join CERN

Having worked closely with CERN for three decades, Estonia has now become its 24th member of the particle accelerator project.

Senegal Comes Aboard China-led Lunar Base Project

Signed on the sidelines of the Forum on China-Africa Cooperation, the agreement allows Senegal to participate in the International Lunar Research Station, which is expected to be deployed in 2035.

ICIMOD holds Consultation with Pakistan on Cryosphere Monitoring

Involving experts from Pakistan, the consultation sought to developing standardised guidelines and methodologies for tracking glaciers, snow, and permafrost across the Hindu Kush Himalayan region.

Emerging Tech & Governance

UK, US, EU Sign Landmark Treaty on AI Safety

Resulting out of negotiations between 57 countries, the agreement serves to ensure that AI development is in line with democracy and rule of law.

UNESCO Releases AI Competency Framework for Teachers, Students

The framework defines the knowledge, skills and values that teachers must possess in the era of AI. It enlists 15 competencies across five dimensions of AI namely: Human-centred mindset, ethics, foundations and applications, pedagogy and AI for professional learning.

G20 Digital Economy Working Group Stresses on Information Integrity, Trust

The Digital Economy Working Group concluded its work ahead of the G20 Brazil Summit. The ministerial declaration emphasises on aspects including information integrity, trust and inclusivity within digital economies.

Events & Meetings

Global AI Summit Starts in Riyadh

Organised by the Government of Saudi Arabia, the summit witnessed the signing of over 80 MoUs and agreements. The Riyadh Charter of Artificial Intelligence which presents AI ethics based on Islamic principles and values was announced at the summit.

BRICS Forum on New Industrial Revolution Held in China

Held in Xiamen, the Forum witnessed attendance from over 40 countries. Thematic discussions were held on topics including AI, smart manufacturing and green industrial practices.

Ninth Forum on China-Africa Cooperation Held in Beijing

Established in 2000 to foster China-Africa partnerships, the FOCAC is held every three years. The theme for 2024 was "Joining Hands to Advance Modernisation and Build a High-Level China-Africa Community with a Shared Future". In addition to announcing a 50 million US dollars fund for Africa, China announced that it would support over 30 infrastructure projects.

Rio de Janeiro Hosts Global Climate & SDG Synergy Conference

Organised the UN DESA and the UNFCCC, the event explored themes including bridging the financial divide in addressing climate change, inclusivity and forest restoration.

India Amps Up Semiconductor Push With Semicon India

Held during 11-14 September 2024, the event focused on the theme "Shaping the Semiconductor Futures", the event brought together several leading semiconductor companies and over 150 experts.

INDIAN SCIENCE NEWS

IISc Researchers Develop Brain Inspired Computing Platform

The platform can store data within a molecular film in 16500 states and can significantly help democratise AI.

India Might Soon Produce a Homegrown Zika Vaccine

The ICMR and Indian Immunologicals have teamed up to develop India's first "codon de-optimised live accentuated" Zika vaccine. Trials to start soon.

Vikram Lander Collects Data on Moonquakes

In a first, the Chandrayaan-3's Vikram lander detected over 250 tremors near the lunar south pole.

INST Develops Low-Cost Waste Water Treatment Method

The method uses sunlight as a catalyst along with microfluidics, a field of study within which fluid behaviour is controlled through microchannels.

IISc Developed Hybrid Nanoparticles Can Kill Cancer Cells

Made of Copper and Gold Sulfide, these hybrid nanoparticles can detect cancer cells using soundwaves and kill them with heat.

New Gas Sensor Can Monitor Nitrous Oxides Pollution

Developed at the Centre for Nano and Soft Matter Sciences , Shivanapura, Karnataka, the gas sensor is based on mixed spinel zinc ferrite nanostructures. It can detect nitrous oxides in low concentrations and even at room temperatures.

IIT Delhi, Honda Sign MoU on AI

The collaboration would focus on cooperative intelligence, the type of AI that allows humans and machines to understand each other using communication and cooperative action.

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AI, Democracy and Human Rights: Examining the Significance of the Council of Europe's AI Convention

Anupama Vijayakumar, Consultant, RIS

The landscape of global AI governance is often described as fragmented with major AI leaders following distinct approaches to regulating the technology. The fragmented nature of this landscape is best evidenced by the larger lack of consensus with respect to what norms shall guide the governance of AI. These distinct approaches reflect the fundamental divergences within the very way in which major powers perceive the nature of AI itself and the end-goals of its deployment. More importantly, these divergences prevail over whether AI regulation should focus on avoiding risks or encouraging innovation. In this regard, the distinctive approaches adopted by the USA, China and the European Union have been termed "market-driven", "state-driven" and "rights-driven" respectively.

Amid this fragmented milieu, a new international agreement imbibing the idea that the use of AI should not contradict human rights has been notified for signing. Negotiated under the auspices of the Council of Europe (CoE), it has been titled the "Framework Convention on Artificial Intelligence and Human Rights, Democracy and Rule of Law". Much of the extant global regime on AI comprises of soft law mechanisms such as principles or declarations. However, the new convention represents a major milestone for those pursuing the achievement of enforceable mechanisms governing the use of AI in various scenarios. A Framework Convention herein refers to "a legally binding treaty that specifies the broader commitments and objectives under the Convention, and sets mechanisms to achieve them".

The Convention primarily serves to "ensure that the activities within the lifecycle of AI systems are fully consistent with human rights, democracy and rule of law". The signatories to the Convention are essentially expected to institute appropriate legal mechanisms to assure the same. The Convention draws from the risk-based approach featured within the EU AI Act. It requires the state-parties to undertake risk and impact assessments to gauge how the use of an AI system could impact human rights, democracy and rule of law. Further, the Convention emphasises upon transparency throughout the value chain of AI systems and AI-generated content. It also stresses on risk management and lays down extensive documentation obligations. Moreover, an obligation on the signatories to make available to the affected persons all relevant information on AI systems and their usage has been imposed.

All these provisions serve to represent a broad consensus on the matter among the 46 CoE countries. A number of observer states including Japan, Australia, Argentina, Costa Rica, Israel, Peru and Uruguay also participated in the negotiations which began in 2019. Non-CoE members including the USA, the UK and Israel have now signed the Convention. However, China and Russia, two major players in global technology governance were not involved in the process and their participation could have rendered the significance of this moment truly magnanimous.

However, questions relating the practicalities of enforcement have already been raised. For one, the convention grants an exemption with respect to the private sector, which develops the majority of AI systems for civilian use. As per Article 3 (b), the Convention only applies to the private sector when they are acting on behalf of public authorities. At least in case of the EU, its domestic AI law already imposes stringent liability stipulations on developers including those from the private sector.

It would have also been ideal for the treaty to draw from its risk-based approach to address any violations from possible military applications of AI. Articles 3.2, 3.3 and 3.4 together grant national security exemptions to the signatories. Perhaps, the signatories may prefer to address the matter outside the purview of the Convention. In this regard, platforms such as the Responsible AI in the Military Domain (REAIM) summit have strived to address the issue. 61 nations including select EU nations, the USA, the UK, Japan and South Korea recently adopted a non-binding blueprint on responsible AI in the military domain at the REAIM summit held in Seoul. Such forums could potentially help catalyse the negotiations held at larger platforms such as the UN Conference on Disarmament.

While concerns remain, the signing of the treaty represents a watershed moment for global AI governance and a major achievement for the CoE. The concerns may be addressed as the signatories come under the same umbrella of the framework convention to institute mechanisms as they deem appropriate. The momentum shall hopefully carry forward to manage risks posed by AI while ensuring its responsible use to bring about the betterment of people and societies.

ADVANCES IN S&T

CRISPR/Cas9 Used to Create Novel Biofuel Feedstock

The development: Researchers at the University of Osaka have em ployed CRISPR to edit the genome of Euglena, a unicellular algae. The modification enables the creation of wax esters two carbons shorter than wild species.

Significance: Euglena can grow easily through photosynthesis and an aerobic production of wax esters. The new development can improve their potential to be utilised as biofuel feedstock.

Implications: The improvement in the cold flow of wax esters makes them more suitable to be used as biofuel feedstock. Similar advances could quickly allow biological sources to serve as substitute to petroleum.

Explainable AI Used to Study Effects of Antibiotics

The development: Researchers at the University of Manitoba have uti lised Explainable AI (XAI) models to train those used in drug discovery to accurately identify the potential biological effects of antibiotics.

Outcome: The use of XAI allowed the scientists to discover elements that humans would have missed. The scientists are working with micro biology labs to confirm the elements identified by XAI.

Future prospects: XAI is riddled with the blackbox problem and can not explain its decisions. The chances similar AI being employed in drug development depends on whether XAI can explain itself.

INSIGHTS & RESOURCES

Indian Science Diplomacy Lays Focus on Space, Semiconductors

This fortnight saw India initiate several collaborative engagements focused on S&T, particularly on semiconductors, space and energy:

• **Brunei**: An MoU on space cooperation on Telemetry and tracking and setting up a telecommand station for satellites and launch vehicles were identified as priori ty areas.

• **Singapore:** Agreements signed on semiconductors, digital technologies, health and skill development.

• First meeting of the **Bhutan-India Joint Working Group** identified "Harnessing Space for the Betterment of People" as a mutual priority.

• **USA:** Under the CHIPS Act, the US and India have partnered to explore opportunities for diversifying the global semiconductor ecosystem.

• **UAE :** An MoU on civil nuclear cooperation has been signed.

New Report on Cluster Munitions

Released by the Landmine and Cluster Munition Monitor, the **report** highlights the following findings:

- Since the adoption of the Cluster Munitions Convention in 2008, the state parties have destroying 1.49 million cluster munitions and 179 million submunitions.
- 28 countries and other areas are contaminated or suspected to be contaminated by cluster munition remnants. These include: Afghani stan, Chad, Chile, Germany, Iraq, Lao PDR, Lebanon, Mauritania, Somalia.
- Use of cluster munitions resulted in civilian casualties in Myanmar, Syria and Ukraine.
- More than half of the parties to the convention do not annually submit transparency up dates.

Mario Draghi Report Identifies the Challenges and Prospects for EU Competitiveness

The **report** was prepared by Mario Draghi, the former President of the European Central Bank. Draghi had been tasked by the EC to put together a report entailing his perspectives on the future of European competitiveness. The report outlines the challenges faced by industries in the EU single market amid the current geopolitical context. Key highlights from the report include:

- Three means to reignite growth have been recommended: closing the technology gap with the USA and China, seizing opportunities emerging from decarbonisation and securing supply chains.
- While continued reliance of China has been mentioned as the best possible means to meet Europe's climate ambitions, it advocates for a nuanced approach to safeguard clean tech jobs in the EU.
- For sectors such as batteries, the report recommends reducing foreign dependence and retaining know-how.
- While noting that Europe has lost out on some digital sectors , AI is highlighted as one area where "European companies can carve out a leading position". It further notes Europe's position in autonomous robotics and AI serv ices as strong and recognizes it as pivotal to improving productivity in pharma, energy and automobiles.
- It recommends for the launch of "EU Vertical AI Priorities Plan" to fund vertical AI models across ten strategic industries.
- It also recognises the importance of scaling up nuclear energy deployment for meeting climate goals. In addition to recommending the introduction of small modular reactors, the report also calls for looking into means to extend the lifetime of existing reactors while also prioritising safety.

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