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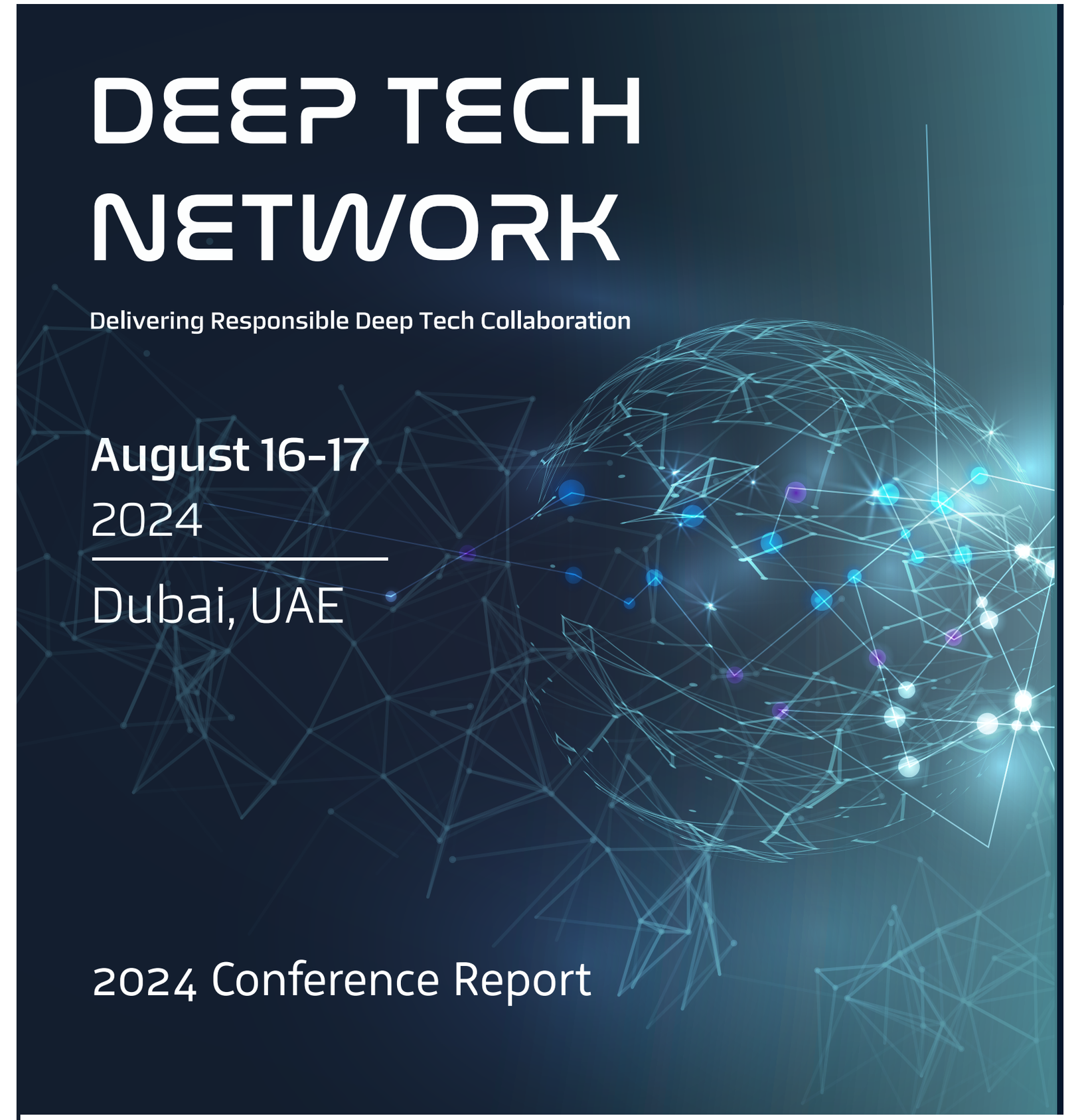
Delivering Responsible Deep Tech Collaboration



August 16-17 2024

Dubai, UAE

2024 Conference Report

RAINCLOUD
Where Defense + AI connect

APRI APPLIED POLICY RESEARCH INSTITUTE ARMENIA

AUDERE CAPITAL

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DEEP TECH NETWORK

Delivering Responsible Deep Tech Collaboration

The Deep Tech Network is a pioneering platform for entrepreneurs, investors, innovators, and policymakers to explore the vast potential of cutting-edge technologies. The inaugural convening of the Deep Tech Network took place on August 16 and 17, 2024, in Dubai, United Arab Emirates.

The Deep Tech Network brings together industry leaders with proven expertise in the deep tech ecosystem. Its members share a common purpose of finding disruptive solutions to humanity's most pressing problems across sectors including artificial intelligence, quantum computing, energy and climate tech, space technology, computational Biology & Chemistry, robotics & drones, Government tech, communications tech, and beyond.

Through this network, we aim to clearly define deep tech and its criticality for various domains and establish common principles for responsible deep tech collaboration with like-minded countries. The inaugural gathering in August marked the commencement of a transformative initiative – which seeks to foster collaboration, innovation, and advancement in the realm of deep technology.

RAINCLOUD™ Where Defense + AI connect

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Foreword

‘DeepTech’ - cutting-edge technologies at the very forefront of their categories, grounded in advanced scientific and engineering breakthroughs, poised to disrupt societies and industries and advance or even solve critical global challenges - and how governments, societies and citizens interact with it, is one of the forces at the centre of shaping the 21st century. DeepTech has emerged as a potentially decade or even century defining investment sector & a major source of short and long term regional geo-political soft power.

In 2022, venture capital investments in DeepTech exceeded **$60 billion,** with the sector now accounting for **20%** of all venture capital funding worldwide, up from 10% a decade ago. By 2030, the DeepTech market is projected to surpass **$3 trillion,** driven by rapid advancements in quantum computing (projected to generate **$7.6 billion** by 2027 at a **48.1% CAGR**), and

synthetic biology, which is forecast to grow at a **28.3% CAGR,** reaching **$116 billion** by 2032.

However, with the proliferation of dual-use technologies, it is crucial that stakeholders align on ethical frameworks to ensure that innovation remains both economically beneficial and socially responsible. This inaugural convening of the DeepTech Network serves as a pivotal step in a direction that combines progress and responsibility.

Dubai, with its forward-thinking approach to AI and technology policy, was selected as host city, not only for its global accessibility, but also as a model for how thoughtful governance can position a region as a global thought leader in emerging technologies — a true "sandbox for the world." Dubai has become the most connected and most visited place on the planet, it is therefore ideally placed to act as the world's incubator and accelerator - inspiring other nations to act just as boldly on their visions for a livable future.

Participants from governmental, non-governmental, private (PE, VC, startups), and corporate sectors all sought collaboration, capital, and long-term partnerships. They left the forum with a deeper understanding of core strategic challenges, a network of alliances poised to drive the next wave of DeepTech forward and a multitude of starting points for driving action-oriented change & awareness in policy building, research focal points and intra-governmental as well cross-institutional collaboration.

Another core aspect of the August 2024 DeepTech Forum was in the building of cross-cultural allieships. India and the UAE are rapidly strengthening their technological and economic ties, particularly in the field of DeepTech. As both nations push to become global leaders in areas such as AI, biotechnology, and quantum computing, they are forging collaborations that leverage each country's strengths. India, with its vast supply of skilled professionals, robust IT industry, burgeoning startup ecosystem, and expertise in space technologies, complements the UAE's visionary investments in AI and renewable energy technologies.

The UAE, particularly through initiatives like the Dubai Future Foundation, has positioned itself as a leader in smart city development, while India continues to expand its influence based on its deep knowledge base in digital technologies. This growing synergy between the two nations is expected to boost innovation and foster an ecosystem that supports mutual growth and cutting-edge technological development.

Recent agreements between India and the UAE highlight the importance of public-private partnerships across DeepTech sectors. The two countries have committed to joint ventures in AI research, fintech, and space technologies, recognizing the need for collaborative approaches in a rapidly changing global tech landscape. Moreover, the Comprehensive Economic Partnership Agreement (CEPA) signed in 2022 has paved the way for enhanced technological cooperation, lowering trade barriers - and increasing the flow of investments in the associated tech sectors. This strategic partnership not only positions both nations as key players in global DeepTech innovation but also builds a strong basis for knowledge transfer and economic growth, helping India and the UAE solidify into technology-driven economies capable of addressing global challenges such as climate change, energy efficiency, and security.

The CEPA aims to expand services trade between the two nations by $15 billion by 2027, including digital trade collaborations through initiatives like the IMEC corridor, announced at the 2023 G20 summit. A project that is set to enhance digital infrastructure, especially in 5G connectivity, which will play a sectoral key role in expanding India and the UAE's DeepTech ecosystems.

The CEPA also led to increased confidence among businesses in both countries, with notable projects such as the Bharat Mart in Dubai and UAE investments like Mubadala's acquisition in the Indian healthcare sector. These initiatives underscore how CEPA is fostering greater integration between the two economies, particularly in technology-driven sectors like DeepTech, energy, and logistics.

We are pleased to present the DeepTech Network Report 2024, a high-level overview providing insight into the conversations taking place behind

closed doors at the inaugural DeepTech Forum centering on the cutting-edge innovations shaping the future of our societies, industries, and global technology ecosystems. As curators of this report, we recognize the pivotal role that DeepTech plays in addressing some of the world's most notable challenges — ranging from climate change to health, security, and sustainable development.

We invite all stakeholders - governments, investors, academics, and innovators - to use the insights from this report to drive impactful and responsible change.

For governments, this means shaping policies that enable technological growth while safeguarding public welfare. By creating supportive regulatory frameworks and fostering public-private partnerships, policymakers can ensure that DeepTech innovations advance in a way that serves society as a whole.

For investors, the opportunities are vast but they come with the responsibilities that are unique to key actors. As DeepTech continues to disrupt and transform traditional industries, it offers not only high returns but also the chance to invest in technologies that will address critical global issues such as climate change, healthcare, and security. The challenge is to ensure investments are directed towards ventures with sustainable, long-term impacts.

For academics, the role is to drive foundational research that informs the development of these breakthrough technologies. Collaboration with the private sector and the application of research to real-world challenges will be essential in scaling innovations responsibly and efficiently.

For innovators, we encourage you to push the boundaries of what is possible, but with a focus on ethical responsibility. Your innovations have the potential to change industries, economies, and lives. We urge you to design and develop with a view not only towards commercial success but also toward societal benefit.

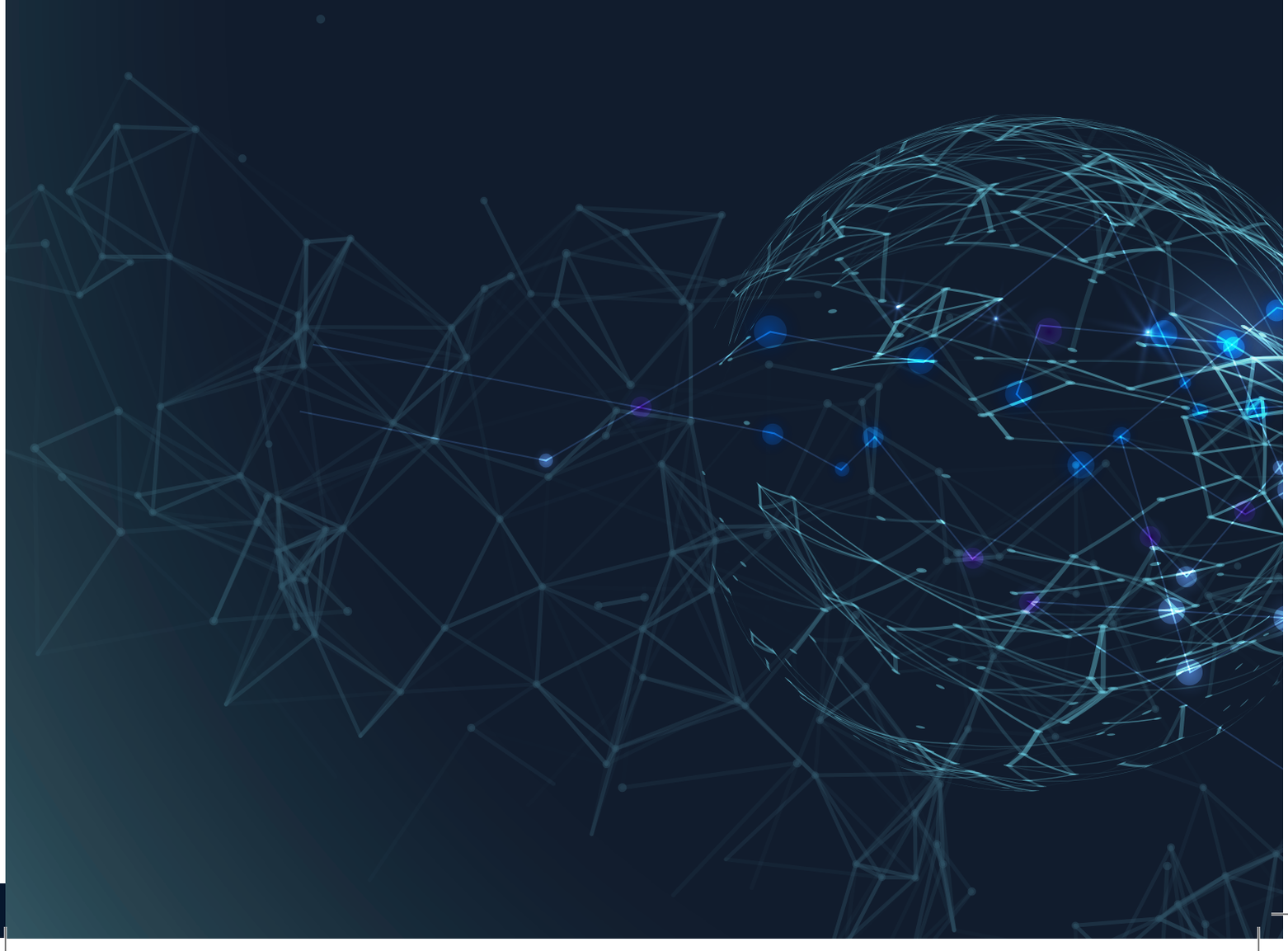
By working together, these stakeholders can ensure that DeepTech innovation is both economically beneficial and socially responsible, shaping a future that advances both technology and humanity.

It is our hope that these insights spark further dialogue, cross-sector collaboration, and, most crucially, action towards a just, globally inclusive and ethically grounded technological future.

This synergy between public institutions, academia, and private capital forms the backbone of the DeepTech sector, helping to push forward high-risk, high-reward technologies that are critical for the future of industries and societies.

Verena Sturm
Director for Innovation, Tech & Social Impact, Observer Research Foundation Middle East

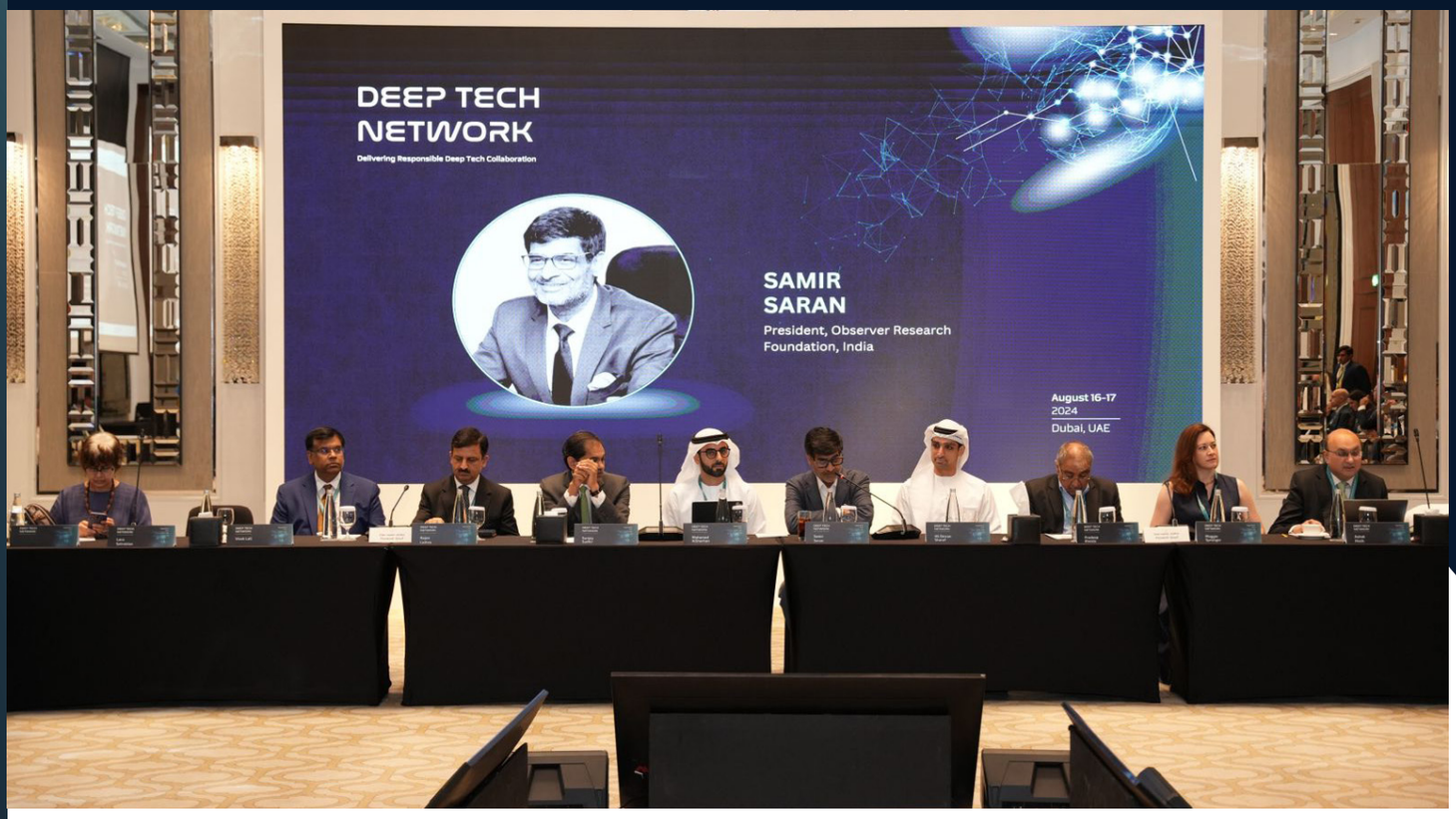
PANEL REPORTS



Inaugural Session

The inaugural session of the Deep Tech Network explored the evolving landscape of global technology development amid geopolitical complexities. The role of collaboration, investment, and national security was emphasised while highlighting key challenges and opportunities for countries, organisations, and individuals navigating this terrain.

The discussants emphasised that while geopolitical tensions and national interests inevitably influence technology development, collaboration remains essential for progress. Countries with limited resources or capabilities, such as the UAE, rely heavily on international partnerships to achieve technological milestones. The UAE's space program was cited as an example, showcasing how strategic partnerships with nations like the US and South Korea enabled rapid advancements.



Such collaborations are necessary when a country lacks the capacity to build technologies independently from start to finish. However, this approach runs the risk of government interventions that restrict these collaborations, driven by national security concerns.

In the current geopolitical climate, several countries restrict technological exchanges based on strategic interests. For example, quantum computing and other sensitive technologies are tightly regulated, preventing international students from certain countries from engaging in related research. Such restrictions create a complex environment where collaboration is necessary but increasingly difficult.

There is potential for countries, particularly in the Global South, to leapfrog technologically and emerge as leaders in key sectors. India and Africa have bypassed traditional wired telephony and adopted mobile technologies directly, achieving a higher level of sophistication in digital services than some Western countries. This leapfrogging is made possible when nations gain access to technology without bearing the burden of initial research and development costs.

However, the panellists expressed concern about the increasing control over technology access, likening it to the restrictions seen with nuclear technology. Advanced technologies, such as AI and quantum computing, are now being regulated similarly, with high entry barriers imposed by leading nations. While controlling technology to safeguard national security is understandable, it limits opportunities for countries to innovate and develop independently. As technological breakthroughs continue to emerge, particularly in semiconductor development in countries like China, the panellists anticipated that market dynamics might shift, potentially loosening these restrictions to maintain global competitiveness.

Investment flows play a crucial role in global technology development. The panel observed that venture capitalists often invest across borders, demonstrating a willingness to finance innovative technologies regardless of geopolitical boundaries. However, geopolitical issues are increasingly influencing investment patterns. For instance, US investments have shifted away from Russia and China due to geopolitical tensions. While China's wealth allows it to self-finance, the restriction of US investments highlights the significant impact of political relations on global technology funding.

Governments are also using investment as a strategic tool to control where capital flows based on national interests. This trend is expected to continue as geopolitical tensions and the competition for technological dominance intensify. As countries attempt to protect their national interests, they are likely to impose further restrictions on cross-border investments in critical technologies. Ethics in technology development was another focal point of the discussion. Ethical implications must be integrated early in the technological research and development process. A proactive approach will address the consequences of technology before they manifest negatively.

Holistic advancement involves building national ecosystems that integrate technology, policy, and international collaboration. Developing a cohesive technological ecosystem involves aligning academic institutions, private companies, and government bodies to drive innovation. This approach will be essential for addressing future national needs, like economic, and strategic challenges, like environmental.

However, there are difficulties in balancing national interests with the need for international cooperation. Governments, driven by security and economic concerns, often impose regulations that restrict technology transfer and collaborations. The growing grey area between commercial and military technologies further complicates this balance. Civilian technologies are increasingly being used for military purposes, as seen in conflicts such as those in Ukraine and the Red Sea. We need more agile government policies that address security concerns while supporting economic growth and technological innovation.

Finally, the discussion addressed the cultural and societal dimensions of technology policy. Countries like the UAE, which host diverse populations, enforce laws that protect against hate speech and foster social cohesion. This approach differs from other nations that prioritize individual freedoms. Even Western countries have differing approaches to free speech on social media platforms, with the US adopting a more liberal stance compared to the EU and Australia, which impose restrictions. Such differences illustrate the cultural and regulatory variations that complicate international technology collaborations and policy alignment. It is important to respect and understand these cultural differences when engaging in international collaborations and policy discussions.

Looking ahead, the trend of tightening technological regulations and investment controls will continue as countries seek to secure their national interests. However, collaboration will be critical in solving global challenges, such as climate change and poverty reduction. A balanced regulatory approach must recognise the necessity of national security while promoting international cooperation and ethical considerations in technology development. By navigating these complex dynamics thoughtfully, countries can harness the transformative potential of technology to foster global progress and stability.

Industry Focus Panels

This segment focused on the strategic importance of startups, scalable insurgents, and established industry players within the deep tech space. Participants were given the opportunity to present their work and technology under three broad categories to understand what these players need to reach their full potential and how global stakeholders can collaborate with them effectively.

i) Smart manufacturing

The first panel highlighted the transformative power of advanced computing, communications, and material sciences in reshaping traditional manufacturing processes. As industries look to modernise and integrate technology, breakthroughs in nanotechnology, advanced materials, and modular production are paving the way for a more efficient and flexible manufacturing landscape.

Speakers emphasised that smart manufacturing involves leveraging these advanced technologies to enhance every stage of the production cycle, from the design of components to the final assembly and quality control. Innovations in communication technology, for instance, are allowing machines and systems within factories to communicate seamlessly, facilitating real-time monitoring and data exchange. This integration not only improves the precision and speed of manufacturing processes but also allows for rapid identification and rectification of errors, ensuring consistent quality and reducing downtime.

A key insight came from experts discussing AI adaptation in manufacturing. AI is being used to optimise production lines through predictive analytics, which can forecast potential machinery failures before they occur, allowing preemptive maintenance and minimising interruptions. AI algorithms are also streamlining the assembly process by managing robotics with greater precision, ensuring efficiency and accuracy in high-volume production environments. Additionally, next-generation surveillance and automation systems will have a significant impact on manufacturing floors. By incorporating AI-driven surveillance, manufacturers can monitor workflows, track the movement of goods, and ensure the safety and efficiency of operations. These systems can identify inefficiencies, such as bottlenecks in production lines or equipment operating below optimal capacity, and provide actionable insights for immediate improvement.

Modular production methods will allow manufacturers to adapt their production lines quickly to different product demands. Modular production supports a more agile and scalable manufacturing environment, enabling companies to meet diverse customer needs without overhauling entire systems. This adaptability is particularly crucial for industries such as electronics and automotive manufacturing, where product variations and customisation are frequent.

Moreover, the use of advanced materials was highlighted as a game-changer in manufacturing. Innovations in materials science, such as the development of lighter, stronger composites, are reducing costs and energy consumption while improving product durability. These materials are enabling the creation of more efficient and sustainable products, aligning with global goals of reducing carbon emissions and waste.

ii) Tech for good

Discussions on deep tech often centre around defence technologies. But there is a flip side to these applications that can be used for the development of society. This panel highlighted the strategic importance of leveraging technology to address public challenges. For instance, in the healthcare sector, the integration of digital platforms and data-driven solutions has improved clinical outcomes. Innovations in health apps have empowered patients, making healthcare more accessible and personalised. However, digital innovation is contingent on converting large volumes of structured and unstructured medical data into actionable insights that enhance diagnostic precision. Similarly, geospatial technologies have proven to be invaluable for critical sectors like communications, disaster management and agriculture. Discussants highlighted how these tools are transforming precision agriculture and decision-making processes in disaster scenarios. These technologies are seen as pivotal for shaping the future of global connectivity and resilience.

Tech for Good initiatives can tackle global challenges through innovation, investment, and cross-sector collaboration, underscoring the transformative potential of disruptive technologies to positively impact industries and societies. Talent development was noted as an important focus area to nurture future

innovators in deep tech. Robust talent pipelines are essential for sustaining growth and ensuring that emerging technologies can continue to develop across industries. This focus on education is critical for the longevity and expansion of tech solutions.

iii) Harnessing dual use technologies

The panel began by bringing forward the importance of aligning with the right investors in the defence technology ecosystem. Traditionally, investors have been hesitant to engage with defence-related ventures due to ethical concerns or restrictions from their stakeholders. However, there has been a noticeable shift in recent years, with more capital flowing into aerospace and defence. This trend indicates growing recognition of the potential for dual-use technologies. The panel stressed the importance of clarity and transparency with investors early on to avoid last-minute withdrawals and to ensure that their objectives align.

The ethical and moral implications of working in defence were another major focus of the conversation. The discussants argued that defence technology involves more than profit; it carries elements of patriotism and ethical responsibility. Companies in this sector must navigate these dilemmas carefully, as they are fundamental to their operations and decision-making processes. Despite the complexities, the sector offers significant opportunities. Companies and the individuals that run them should prioritise their mission and values, ensuring that their decisions align with long-term objectives and ethical considerations.

Securing institutional investment for dual-use and defence technologies has been particularly challenging in Europe and the US, due to regulatory and ethical concerns. However, accelerators and startups are finding ways to navigate these barriers by focusing on scalable, cost-effective solutions that can be quickly deployed. Discussants shared the importance of aligning with NATO allies and democratic countries as a strategic approach for seeking support and partnerships. The discussion contrasted the rapid innovation cycles in today's conflict zones like Ukraine with the slower, decade-long cycles typical of established defence markets.

An emergent theme was the way in which AI and autonomy have transformed modern warfare. Integrating AI with autonomous systems has the potential to transform battlefield dynamics, removing human operators from direct conflict and deploying persistent robotic systems, thus minimising human casualties.

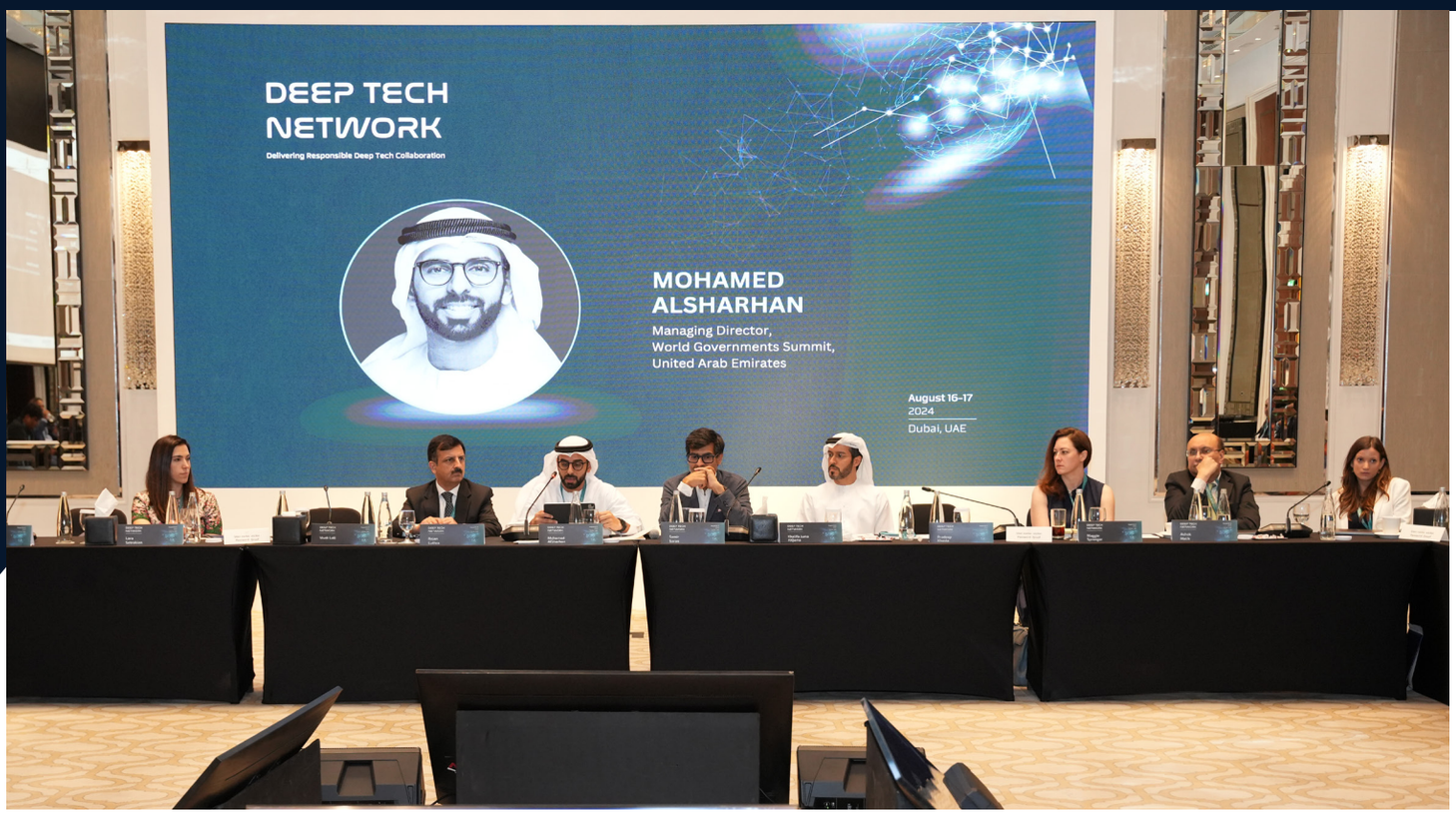
Beyond military applications, participants explored AI's potential in solving complex civilian challenges such as airspace management and safety. AI-driven systems that mitigate bird strikes and detect drones in various settings. These technologies, which operate passively without radar, highlight the versatility of AI in enhancing public safety and environmental management. AI's integration into civil applications illustrates deep tech's expanding role beyond defence, showcasing its transformative impact across sectors.

The panel concluded by underlining the importance of partnerships among governments, academia, and the private sector. Participants called for more structured collaborations to help deep tech startups access global markets and scale their innovations. Such partnerships are essential to ensure that technology development is rapid, scalable, and aligned with broader societal and economic needs.

Catalysing a Robust Deep Tech Ecosystem

The deep tech ecosystem is currently in an interregnum period. The geopolitics and norms set in place since World War II are undergoing significant changes, and disruptive technologies are poised to reshape the future. As the ecosystem develops, partnerships, both local and international, are becoming key for technological advancement. While competition between nations is natural and desirable, it is only through collaboration that we can address the three grand frontiers for humanity today- improving biological life, creating artificial life, and expanding into space.

The pace of technological advancement also has significant implications for national security. The future of warfare will be contingent on persistent intelligence, surveillance, and reconnaissance capabilities. Creating technology that fulfils the needs of such a national security landscape calls for an open architecture system



that is built on shared standards. When it comes to defence platforms, there are three critical areas where deep tech will reshape the sector: the need for aforementioned open architecture, the growing importance of electronic warfare, and the integration of big data and cloud computing. These technologies are converging to define the defence platforms of the future.

However, participants highlighted their concerns about the misalignment that has been observed between the stakeholders in the deep tech ecosystem. Founders and investors highlighted the challenges they have faced which often distracts them from focusing on innovation. This includes securing funding, especially from government agencies, a disconnect in public-private partnerships in deep tech, intellectual property concerns, and investor outlooks on returns from deep tech investments. There is also a gap between academia and entrepreneurship. While innovation often starts in universities, it is not always commercialised effectively.

Investors often fear that deep tech investments become a bottomless pit. The liquidity situation in the market has shifted since a few years ago, when it was easier for venture capitalists to raise capital to invest in startups, even if imprudent. Some now hold portfolios with investments that may not perform as

expected. This has created a risk-averse environment, where firms are focusing more on realised returns than on growth or momentum indicators. Participants allayed investor fears by pointing to the liquidity available in private markets. They suggested that venture capitalists need not be afraid of investing in deep tech if they explore ways to mitigate risks through secondary markets.

Another significant area of concern is surrounding intellectual property (IP) issues. IP theft remains a problem globally, alongside the challenge of protecting IP effectively. Large companies have also been known to stockpile IP for competitive advantage, which makes it harder for smaller players and startups trying to innovate. Even once these challenges have been dealt with, global standards for valuing intellectual property vary widely and IP valuation is often subjective and inconsistent across different regions and industries. Startups also shared the challenges they have faced, particularly in India, in writing off research and development (R&D) expenses when projects fail. There was a call for global standards or guidelines for handling IP valuation and R&D write-offs to help deep tech startups manage financial risks better. However, the suggestion to standardise market valuations for IP faced strong opposition due to concerns about the risk and potential of undermining free market principles. It was suggested that technological innovation today is outpacing the traditional IP system. The way we handle questions about IP and innovation may undergo significant changes within the next decade, potentially moving beyond the current system which is increasingly seen as outdated.

Soft elements of the ecosystem are often overlooked in favour of a focus on funding. While building cross-border ecosystems for deep tech innovation, it is important to keep in mind that unlike biological ecosystems, human ecosystems are built on people and cultural connections. Understanding cultural differences is crucial when facilitating collaborations between regions such as the US, the Middle East, and Asia.

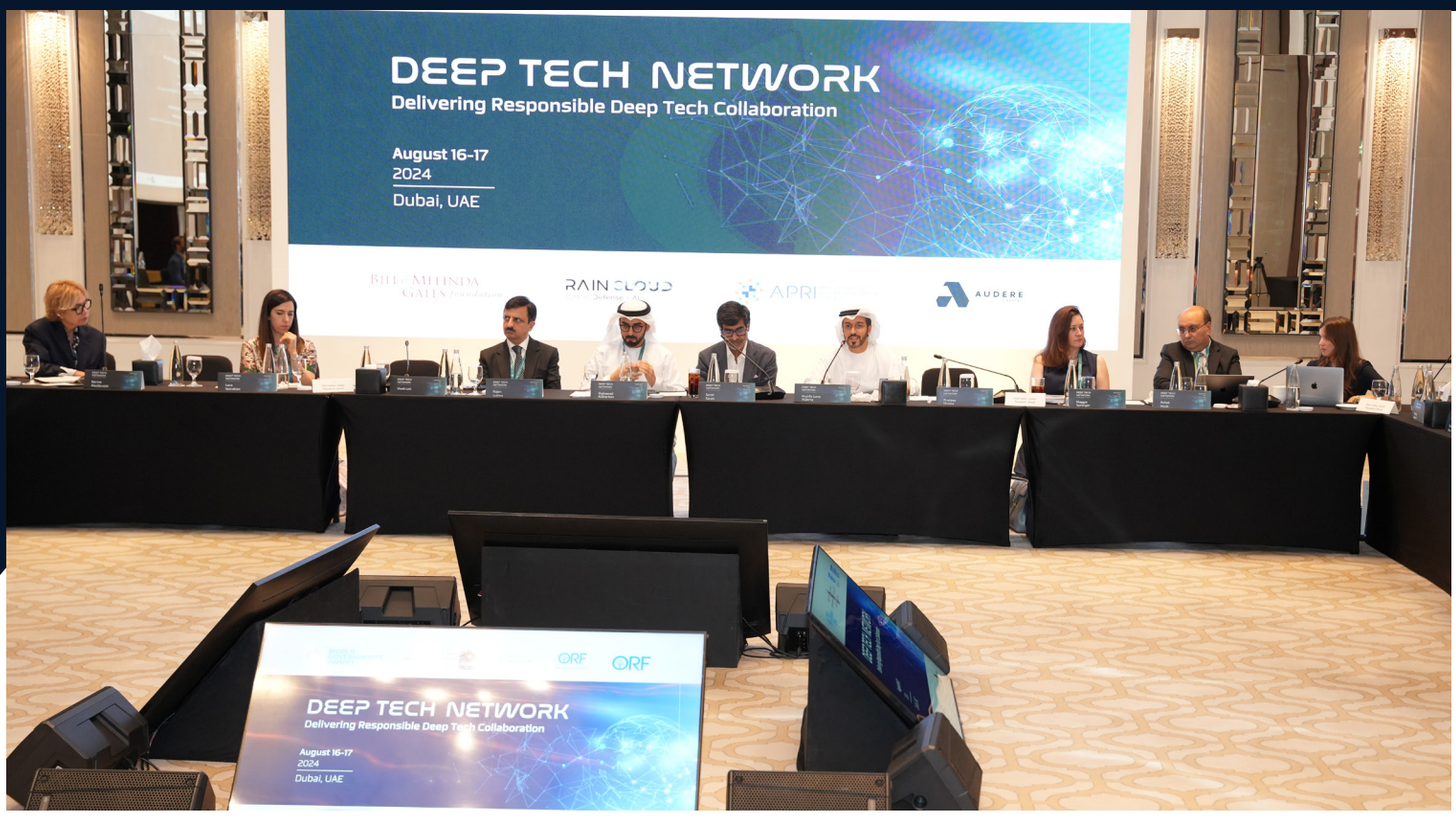
Apart from financial backing, firms also need their funders to provide strategic value in areas like customer acquisition and networking to ensure success. Frameworks such as the “four Cs”- capital, content, customers, and contacts- can be used to better support ventures. At a macro level, workforce development

and leadership are crucial to development. Participants stressed that attributes like adaptability, emotional intelligence, and creativity are essential for the future workforce, alongside technical expertise. Future leaders must possess visionary thinking, agility, decisiveness, empathy, emotional intelligence, and a strong sense of ethical integrity to navigate the rapidly evolving technological landscape.

Catalysing the deep tech ecosystem will require moving away from a zero-sum mindset that is focused on maintaining control and embracing a flexible mindset focused on innovation and growth. Technology is increasingly acting as a mirror that reflects our choices. With the right focus, these choices will shape a positive future that leads to inclusive growth.

Building Bridges in Deep Tech

There is an urgent need for collaborative deep tech innovation that balances rapid experimentation with careful consideration of ethical and societal implications. A key theme through the discussion was the need for effective ecosystems for deep tech innovation. All stakeholders- governments, industry, academia, entrepreneurs, and investors- need to be able to collaborate more closely. It is vital that nations start taking a long-term strategic view when deploying capital and developing technologies, with a focus on sustainable value rather than short-term gains.This landscape can be seen as a war that needs to be fought on three fronts: defence and national security, promoting welfare and prosperity, and fighting disease and disaster. This requires a conducive environment that fosters experimentation while ensuring that ethical considerations remain at the centre of development.



Collaboration in deep tech will need a focus on developing alternative models and strategies that can foster innovation while addressing global challenges. Sandboxes can create this space while also allowing for newer funding models and intellectual property frameworks to support innovation. A significant point is the role of organisations like MITRE, which operate research centres for the U.S. government and explore new models of science and technology collaboration. These models include place-based innovation, where specific industries are concentrated in certain areas to drive growth. The creation of "technology town squares," can foster dynamic, multi-party engagements across sectors. There also needs to be an emphasis on public-private partnerships and workforce development initiatives through broad and inclusive networks.

The defence sector is a key area where technological superiority is shifting away from traditional measures like GDP and population size, and instead focusing on the rapid integration of new technologies. Rapid adaptation of new technologies can be facilitated by connecting venture capital and private equity to technology companies. This is being addressed by initiatives like RainCloud, an online platform that enables collaboration in the defence and intelligence sectors. The UK's Catapult initiative is another solution, designed to bridge the gap between research and commercialization, often referred to as the "valley of death" for innovation. Catapult centres in the UK focus on deep tech areas such as renewable energy, semiconductors, and smart cities. These centres work on

high-risk projects that create new markets, identifying regulatory opportunities and scaling innovations from lab to market. An emphasis is placed on “failing fast” and iterating quickly, supported by living labs where new technologies are tested in real-world environments. Multilateral funds, especially in AI, can be a means of pooling resources and accelerating innovation in critical sectors.

Another key topic highlighted was the ethical and geopolitical implications of technological advancements, particularly in AI. The dangers of dual-use technology like AI, such as bad actors exploiting autonomous technologies for malicious purposes, indicate the need for a more responsible and internationally coordinated approach to development. We can draw parallels to historical lessons from similar dilemmas with innovations like nuclear technology. Participants called for frameworks and governance mechanisms to manage the risks associated with rapidly advancing technologies.

In terms of international collaboration, the challenges of export control regulations and geopolitical tensions are significant barriers to deep tech innovation. Differences in export regimes, even between long-standing partners, complicate long-term investments and collaborations. All stakeholders, from nations to industries to universities, must align their strategic interests and operate through flexible systems that can adapt to the unpredictable future of innovation.

Developing nations must capitalise on leveraging strategic technologies for geopolitical advantage. Despite challenges like unstable local currencies and limited policy frameworks, efforts are underway to create a conducive environment for both local and global companies. Collaboration is essential to maximising the potential of emerging regions. The global exchange of knowledge and technology can help mitigate the challenges these countries face in scaling startups and accessing international markets. This requires forging international partnerships, aligning global markets, and developing common standards to support the growth of deep tech startups.

Participants highlighted the challenge of cultural differences that often hinder collaboration. Mutual understanding and improved communication are essential for advancing technology that benefits society. There must also be clear communication between deep tech practitioners and the public to ensure that

people understand how emerging technologies like AI will affect their lives. Miscommunication in the media can lead to fear or misunderstanding. So, it is important to provide accurate information and foster intelligent, balanced conversations about the future of technology.

The session stressed the need for patience in measuring the success of international collaborations. There is optimism that time and persistence will bring about positive outcomes. But success will rely on continued research and development on aligning incentives and multilateral collaborations, laying the groundwork for future deep tech initiatives.

Closing Session

The strategic potential of deep technologies make them simultaneously national and global in their nature. Innovation is increasingly less insulated from the broader political context within which it operates. Today, technology and trust are closely linked. Companies no longer operate with the same autonomy they enjoyed during the early days of digital and internet incubation. Governments play both a facilitative and prohibitive role, making deep tech highly political and even geopolitical. As a result, deep tech ecosystems cannot be entirely separated within a country. As great power politics push countries towards clarity and realism, nations will be compelled to approach the sector with a long term view.

Ethical considerations and values are also increasingly influencing innovation. Different societies and geographies bring diverse perspectives on ethical standards to deep tech. Divergences are unavoidable given the profound societal impacts of these technologies. Responsible development and deployment, along with stakeholder buy-in, are crucial to ensuring that these innovations benefit society while mitigating risks.

Global connectivity in deep tech is not homogeneous or geographically contiguous. Challenges vary based on local natural, demographic, and market conditions, defying simple global north-south distinctions. These complex issues require localised solutions.

Deep tech growth is reliant on talent development to create a skilled workforce proficient in advanced scientific and engineering disciplines. In sectors like cybersecurity, there is significant untapped potential for bilateral and multilateral cooperation among trusted geographies. However, the sector faces a global skills shortage. 30 percent of cybersecurity roles in India remain unfilled. These skill gaps must be adequately addressed to sustain the sector.

Investment opportunities in deep tech are expanding as venture capital recognises the potential for high returns in transformative technologies. However, deep tech faces unique challenges due to the high costs of research

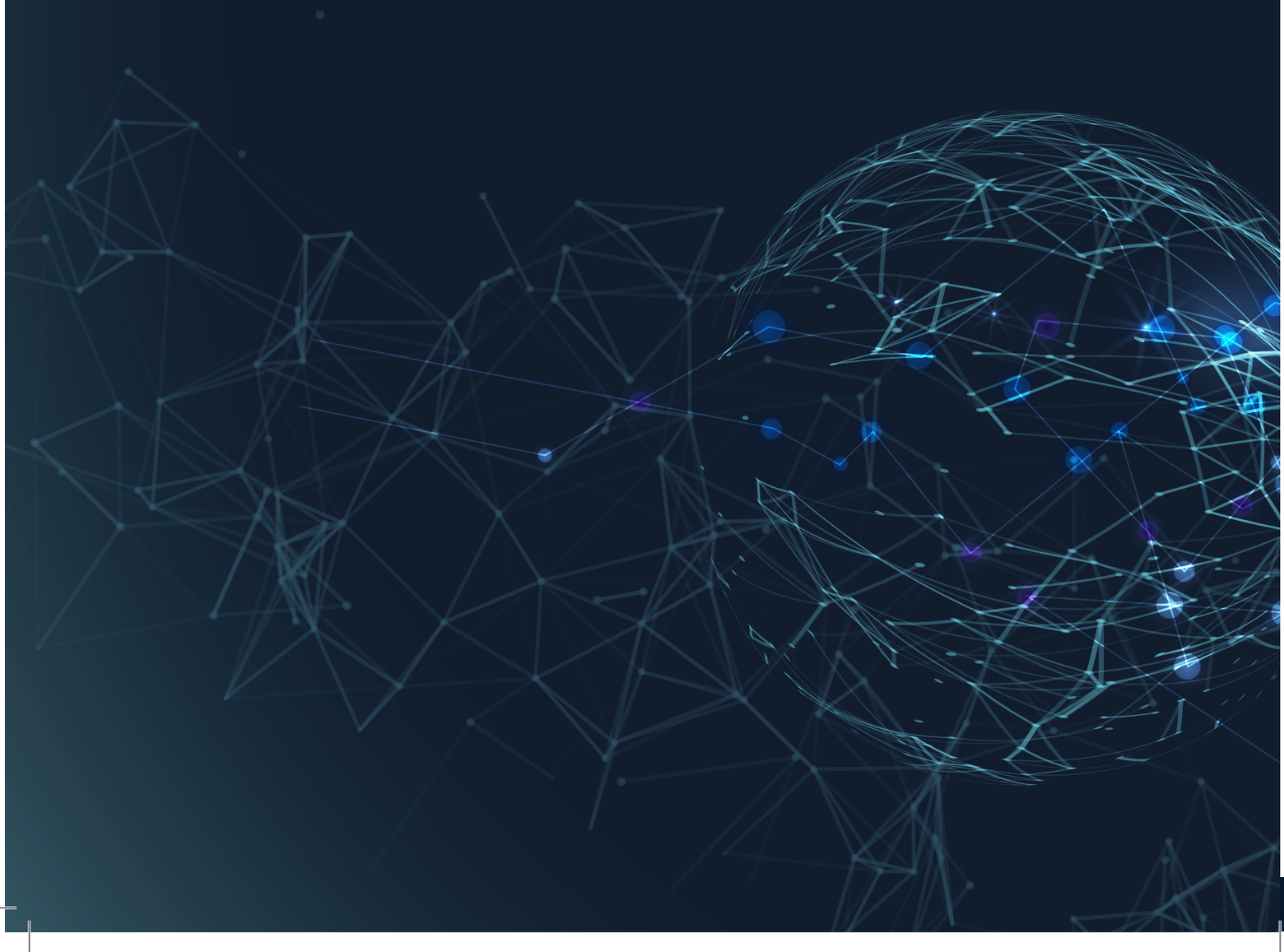
and development and regulatory hurdles. Overcoming these challenges requires collaboration among stakeholders to navigate the complex landscape of deep tech innovation.

India's approach to AI provides a compelling case study, focusing on three pillars: data, compute, and indigenous large language models. Public institutions possess valuable data that must be unlocked for innovation. Resource constraints in computing demand creative solutions, such as leveraging a mix of GPUs, cloud, and edge computing. We must be careful to avoid a spending race to the bottom by balancing cost and capability. India's Digital Public Infrastructure template has already demonstrated success in creating public infrastructure that unlocks private innovation, supported by strong software competence and the ability to adapt models for priority use cases in health, education, agriculture, and public service delivery.

Intellectual property, particularly for dual-use and defence technology, has seen significant progress, especially with large American companies making strides in co-production. However, the cradle of innovation today is smaller firms that are hesitant about working with India and other emerging economies. The government on both sides need to provide frameworks and reassurance to facilitate greater collaboration.

The technologies discussed at this forum have the potential to reshape global power dynamics, influence economies, and alter sociopolitical structures. Decisions made around deep tech will have far-reaching impacts across borders and generations. We must therefore be intentional in the norms we create going forward. Regulatory and structural challenges must be discussed with all the stakeholders involved. It is only through international cooperation, ethical leadership, and thoughtful regulation that we can ensure technological advancements promote stability, prosperity, and equity for all.

CONFERENCE AGENDA



DAY ONE: FRIDAY, AUGUST 16, 2024	
0930-1045	**Inaugural Session** In the Chair: Samir Saran, President, Observer Research Foundation Introductory Remarks: Mohamed AlSharhan, Managing Director, World Governments Summit, United Arab Emirates **Special Address: Anne Neuberger,** Deputy National Security Advisor, United States **Keynote Address: Sunjay Sudhir,** Ambassador of India to the United Arab Emirates **In Conversation: H.E. Omran Sharaf,** Assistant Minister of Foreign Affairs and International Cooperation for Advanced Science and Technology, United Arab Emirates **Pradeep Khosla,** Chancellor, University of California San Diego, United States
1045-1115	**Tea/Coffee Break**
1115-1145	**Opening Interventions by the Curators of the Network (10 minutes each):** **Yervant Zorian,** President, Synopsys Armenia; Chief Architect and Fellow, Synopsys, Republic of Armenia (Pre-recorded message) **Maggie Sprenger,** General Partner and Co-Founder, Audere Capital, United States **Rajan Luthra,** Distinguished Fellow, Observer Research Foundation; Chairman's Office, Head-Special Projects, Reliance Industries, India

1145-1315	**Industry Focus** This segment will focus on the strategic importance of startups, scalable insurgents, and established industry players within the deep tech space. Companies will have the opportunity to present their work and technology—from development to application and scalability; what they require (from capital to R&D) to reach their full potential and how global stakeholders can collaborate with them effectively. Conversations will include investment and funding, market access, technical knowledge, access to facilities, and talent acquisition. **In the Chair: Maggie Sprenger,** General Partner and Co-Founder, Audere Capital, United States **Scene Setting Presentation:** Charles Clancy, Senior Vice President, MITRE, United States **Pitches will encompass the following thematic areas:** **Smart Manufacturing:** Advances in next-generation computing and communications have completely altered the manufacturing landscape. Breakthrough developments in advanced materials, nanotechnology, and novel alloys have transformed modular manufacturing, technology integration, and circular economy principles. Discussions can centre on the approaches to overcome the physical and institutional inertia of legacy processes, to embrace a more innovation-driven future. **Kickoff Interventions** **Parag Naik,** Founder and Chief Executive Officer, Saankhya Labs, India **Jags Kandasamy,** Chief Executive Officer and Co-Founder, Latent AI, United States **Sandeep Shah,** Managing Director, Optimized Electrotech, India

	Tech For Good: Disruptive technologies have revolutionised the fields of healthcare, disaster management, space operations, transportation, and agriculture, expanding the realm of possibilities for the use of tech in welfare and human security, and providing innovative solutions to collective problems. Advanced technologies can convert structured and unstructured data into actionable insights at speed and at scale, which can elevate clinical outcomes, enhance precision agriculture, forecast weather, predict natural disasters, assess food value chains, and enhance space situational awareness. **Kickoff Interventions** **Ayushi Mishra,** Chief Operating Officer and Co-founder, DronaMaps, India **Ishita Barua,** Co-founder and Chief Medical Officer, Livv Health, Norway **Marie Lou Papazian,** Founding Chief Executive Officer, TUMO Center for Creative Technologies, Republic of Armenia **Harnessing Dual-Use Tech:** The Fourth Industrial Revolution has significantly impacted the development and proliferation of dual-use technologies, which have both civilian and military applications. Developments in augmented reality, GPS, thermal imaging, nuclear technologies, hypersonic capabilities, and drones have fundamentally transformed industries and society. The concentration of these technologies in the hands of one entity can however affect competitiveness, innovation and supply chain resilience. Governments, private sector enterprises, and civil society actors must work collaboratively to establish frameworks for the responsible development, ethical use, and continuing evolution of these technologies.

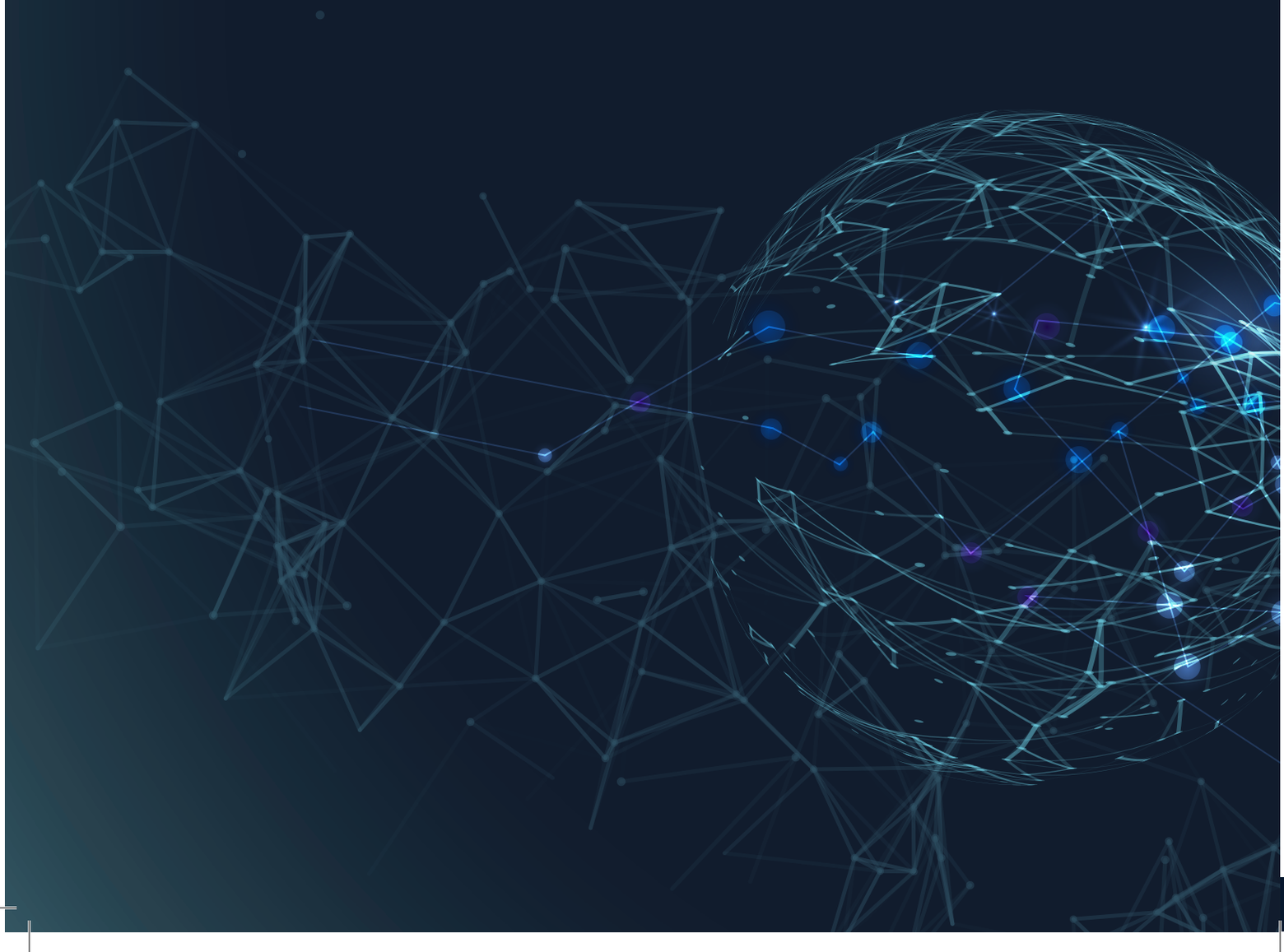
	Kickoff Interventions **Sameer Joshi,** Chief Executive Officer and Director, NewSpace R&T, India **Philip Jungen,** Founder, Darkstar, Germany Fabio Masci, Lead Executive, The Edge Company, Italy **Discussants** **Discussant 1: Yonghwan Kim,** Chief Executive Officer and President, Smart Radar System, South Korea **Discussant 2: Praveen Dwarakanath,** Director and Chief Executive Officer, Big Bang Boom Solutions, India
1315-1430	**Lunch**
1430-1440	**Speed Talk** **Vivek Lall,** Chief Executive Officer, General Atomics Global Corporation, United States
1440-1610	**Catalysing a Robust Deep Tech Ecosystem** **In the Chair: Rajan Luthra,** Distinguished Fellow, Observer Research Foundation; Chairman's Office, Head-Special Projects, Reliance Industries, India **Scene Setting Presentation: Takayuki Sato,** Resident Executive Officer, Regional Head for Europe Middle East and Africa, Japan Bank for International Cooperation, United Kingdom A deep tech ecosystem grounded on early stage unproven scientific and engineering advances requires significant mobilisation of private capital. These technologies carry a higher level of risk than ordinary investments due to their substantial capital requirements, and an uncertain commercialisation roadmap for the future. Institutional investors, venture capital firms, and private equity funds will elaborate on their investment theses, time horizons, and main challenges when it comes to the deep tech sector. This session will serve as a bridge between capital allocators, founders, and practitioners.

	Kickoff Interventions **Rajeev Mantri**, Founder and Managing Director, Navam Capital, India **Tsuyoshi Ito,** Chief Executive Officer and Managing Partner, Beyond Next Ventures, Japan **Peter Ackerson,** General Partner, Audere Capital, United States **Sachin Seth,** General Partner, Trousdale VC, United States **Armen Kherlopian,** Chief Executive Officer, Covenant Venture Capital, Republic of Armenia **Mohamed ElDoh,** Director of International Business Development, United Investment, United Arab Emirates **Amine Staali,** Managing Partner and Chief Executive Officer, DeepMinds Ventures, United Arab Emirates **Karen Gyulbudaghyan,** Founder, Strategic Value Ventures, United States **Discussants** **Discussant 1: Tigran Shahverdyan,** Co-founder and Board Member, Bazoomq Space Research Lab, Republic of Armenia **Discussant 2: Kedar Nadgaundi,** Executive Director, Levicon India System Pvt Ltd, India
1610-1630	**1610-1630**
1630-1640	**Speed Talk** **Andrew Pease,** Technical Collaboration Manager, Energy Systems Catapult, United Kingdom
1640-1800	**Building Bridges in Deep Tech** **In the Chair: Samir Saran,** President, Observer Research Foundation, India **Scene Setting Presentation: Khalifa Juma AlQama,** Head of Labs, Dubai Future Foundation, United Arab Emirates

	The development and scalability of novel solutions to address humanity's most pressing problems requires inclusive collaboration across borders and stakeholder groups. Common principles for deep tech collaboration must be developed with human beings at the core, so as to effectively forge international partnerships and institutionalise the roadmap for effective governance and oversight. Embracing responsible innovation, robust intellectual property frameworks, talent development, knowledge sharing, and global connectivity is key to unlocking the transformative potential of deep tech innovations. **Kickoff Interventions** **Del Titus Bawuah,** Founder and Chief Executive Officer, Future Forward, United Kingdom **PJ Maykish,** Senior Advisor, Special Competitive Studies Project, United States **Andy Sellars,** Chair, UK Semiconductor Expert Working Group, United Kingdom **Prashant Pathak,** Chief Executive Officer, Ekagrata Inc, Canada **Justain Bracken,** Chief Executive Officer, Helianthus Holding, United Arab Emirates **Rabih Khoury,** Partner and Chief Exit Officer, Middle East Venture Partners (MEVP), United Arab Emirates **Musafumi Senda,** Country Head, New Energy and Industrial Technology Development Organization (NEDO), India **Miiko Yasumatsu,** Chief Officer - Global Business Support Section Startup Support Department, New Energy and Industrial Technology Development Organization (NEDO), Japan **Raffi Kassarjian,** Chief Executive Officer and Principal Advisor, Sensyan, United States **Lara Setrakian,** President, Applied Policy Research Institute, Republic of Armenia

	Discussants **Discussant 1: Leonid Nersisyan,** Senior Research Fellow, Applied Policy Research Institute, Republic of Armenia **Discussant 2: Christine Callsen,** Strategy Director, MITRE, United States **Discussant 3: Norine MacDonald,** President and Founder, RAIN Defense + AI, UAE
1800-1810	**Wrap up** **Ashok Malik,** Partner and Chair-India Practice, The Asia Group, India
1810-1825	**Closing Remarks** **Verena Sturm,** Director of Innovation, Tech and Social Impact, Observer Research Foundation - Middle East, United Arab Emirates **Mohamed AlSharhan,** Managing Director, World Governments Summit, United Arab Emirates

PARTNERS



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