

INDO-PACIFIC GEOINTELLIGENCE

6-7 June 2023 | Vivanta, Dwarka, New Delhi



THEME SPACE INFRASTRUCTURE
AND GEOINT STRATEGY

A SHARED VISION

CONFERENCE REPORT

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INDO-PACIFIC GEOINTELLIGENCE

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A GRAND SUCCESS!

With 586 participants representing 24 countries, the conference was a resounding success in terms of its attendance, international diversity, and the quality of discussion, presentation and bringing together professionals, innovators, and thought leaders from across the globe to foster collaboration, exchange ideas and explore emerging trends.

The conference focused on the Space Infrastructure and Geospatial Strategy aiding military operations and support in monitoring, evaluating, and incorporating location intelligence into high-level decision-making.

Our diverse and dynamic group of speakers and panellists provided in-depth technological insight and actionable and practical geospatial tools as a critical role in maintaining regional stability and security. Apart from the Plenary talks and discussion and track on defence and internal Security the two-day conference witnessed technology demonstration; partner-based program; open house discussion, and Bi-lateral summits.



KEY STATISTICS

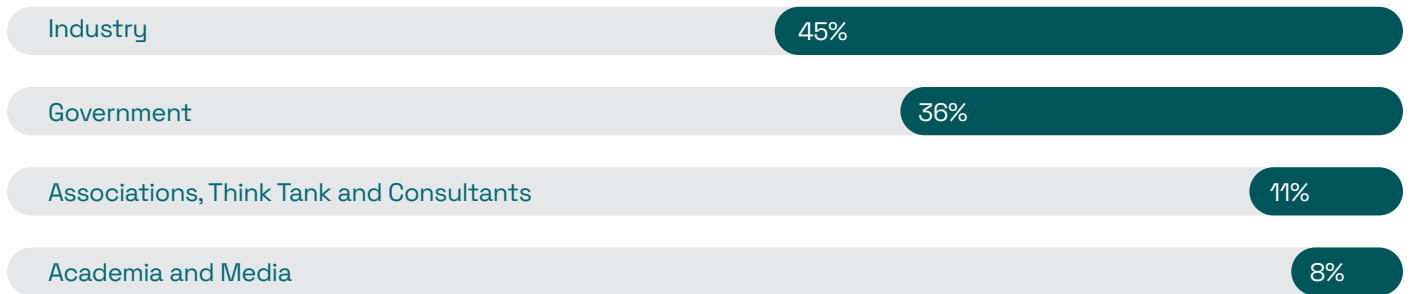
PARTICIPATED COUNTRIES



KEY FIGURE



DELEGATE SEGMENTATION





CHIEF GUEST

Shri Rajnath Singh
Hon'ble Raksha Mantri
Ministry of Defence, India



It is important to have a peaceful and stable Indo-Pacific, which permits the economic development of the aspiring nations in these regions. Space-based assets, geospatial technologies and real-time intelligence is a key factor and a critical thought to modern warfare, with India as a nation's endeavour to support Indo-Pacific countries in developing crucial geospatial technologies and space infrastructure.



OPENING SESSION



Geo-intelligence coupled with space-based assets, or the maritime-based assets, ground-based assets, and integrating all of these to provide a real-time update is very important. Every country cannot invest in relevant data. Smaller countries, in particular, get a lot of information from this setting and hence we should focus on more support and collaboration. There should be trustworthy cooperation among nations, and they should be able to share the information that is useful for the humankind.”

Dr G. Satheesh Reddy

Scientific Advisor to Defence Minister, India



The challenges of Indo-Pacific region include territorial disputes, maritime and traditional terrorism, non-traditional threats as well as climate change. There's a need to focus on Artificial Intelligence, Machine Learning, new sensors, and advanced GIS. There is also need of collaboration and cooperation between Data and Geographical Space Technology especially by the Quad countries in the Indo-Pacific region.”

Lt Gen Dinesh Singh Rana, AVSM, YSM, SM Ph.D

DGDIA & DCIDS (INT)



Geospatial-Intelligence Infrastructure is important in enhancing maritime situational awareness. It plays a vital role in enhancing awareness by integrating and analyzing geospatial data, enabling real-time monitoring, and supporting informed decision-making in various aspects of maritime operations.”

Vice Admiral Sanjay Mahindru, AVSM, NM

Deputy Chief, Naval Staff, India



Though the United States of America is the global military superpower, in the Indo-Pacific region it is coinciding with the rise of China as a superpower with their wolf warrior diplomacy, making it difficult for the US and countries in the Indo-Pacific region.”

Lt Gen AKS Chandele PVS, AVSM Ph.D (Retd)

President- Defense, Internal & Public Safety, Geospatial World, India



PLENARY SESSION: INDO-PACIFIC AND EVOLVING WORLD ORDER



New World Order signifies a path-breaking epoch when there is a rupture in established power equations, and a rapid re-alignment in normative social, cultural, economic, and political configurations. Change is not comfortable, but it is inevitable, however changing out of compulsion is reactive, but out of choice is pro-active.”

Sanjay Kumar

Founder and CEO, Geospatial World



Given the fact of China's rise and its diplomatic heft, all stakeholders must work proactively to institutionalize arrangements and build transparency. Transparency doesn't always lead to agreements but informs our perspectives and understanding. In a bipolar world led by USA and USSR, tech was kept under the wraps as a closely guarded secret. But today, the world has changed. We have commercial companies collecting RF; SAR is becoming commonplace. Satellite companies contribute to situational awareness capabilities today. Enormity of this change is exciting as well daunting.”

Robert Cardillo

Chair, USGIF Board, USA



We need investments in satellite navigation systems, robust geospatial infrastructure, forge partnerships, and optimize collaboration. There need to be initiatives not to constraint China but to offer them alternatives. Whole ideation is to create 'rule-based systems' so that people make their own choices.”

Brig. Arun Sahgal

PhD, Director, The Forum for Strategic Initiative, Distinguished Fellow School of Geopolitics Manipal Academy of Higher Education and Senior Fellow, Delhi Policy Group



Geospatial Intelligence is crucial for shared national security threats as well as disaster management, planetary health, supply chain, cyber security, surveillance, and airborne defense. EO can be used in everything from flood monitoring, forest fire detection, and maritime monitoring. Cross-border public-private partnerships and entities.”

Hirokazu Mori

Chief Strategy Officer, WARPSPACE, Japan



There are four key factors driving geopolitics today: climate crisis, disruptive technologies such as AI, demographic changes and shifts, and the type of political systems, whether inclusive or exclusive. India has the potential of being a multi-polar country but a lot of rests on inclusivity and harmony. There's a need of new governance models.”

Gautam Mukhopadhyaya

Former Ambassador and Visiting Faculty, Centre for Policy Research, India



GEOINT DATA FUSION FOR REAL-TIME INTELLIGENCE



Geoint is putting all types of intelligence onto a platform that all the users are comfortable with. The newage, unrestricted, kinetic and non-kinetic wars that we are in amidst of imply that it's not only about physical security that we are looking at. Instead, the threats are multifaceted and in many domains. So, while we need intelligence for our physical security, we also need intel data and AI collaboration for better digital security.”

Lt. Gen. Vinod G. Khandare, PVSM, AVSM, SM (Retd)

Principal Adviser, Department of Defence



Digital Twin is a concept of digital representation of the physical world. We have been making digital maps for a long time but those are not digital twin. What makes something a digital twin is bringing real-time data into a static map collection. Furthermore, it began as a construction tool and now has been expanded for further operational capabilities.”

Randall Billy

Director for International Government BD, Esri USA



Through Unique Signal Recognition (USR) technology, detection, geolocation, and identification of dark vessels have been made easy due to the Machine Learning techniques and unclassified, commercial RF Data. Furthermore, through the help of big data set, multiple expert processing techniques, and robust validation, USR technologies open a wide range of related analytics to assist end users in the maritime environment.”

James McAden

Senior Director – Asia-Pacific Sales, HawkEye 360





There is an increased focus on tech fusion. Combining the architecture, infra, technologies, and target into one single platform proved to be challenging. Now, we have developed platform so that we can decouple certain layers for more clarity. This also reduces our procurement problems and reduces the overall acquisition cost.”

Lt Gen Sanjay Sethi VSM
DGIS, Indian Army



During Covid 19, department of survey and imaging division played an important role. The data collected, processed, and analyzed by them was able to give more accurate information for the Malaysian National Security Council and armed forces. This helped with Covid hotspots, maintaining hospitals, selected quarantine area, and various checkpoints.”

Major General Dato’ Hj Ya’cob Bin Hj Samiran
CEO, Malaysian Institute of Defence and Security (MiDAS), Malaysia



Space-based commercial tactical ISR provides real-time and near real-time data, including high-resolution imagery, geospatial intelligence and feed into a pattern of live understanding. This enables ministries and warfighters to have an increased understanding of the battlefield, including terrain features, enemy positions, and potential threats. It enhances situational awareness and helps in making informed decisions.”

Andy Stephenson
Senior Vice President, International Business Development & Worldwide Sales, BlackSky, USA



ADVANCING SPACE INFRASTRUCTURE FOR DEFENCE AND SECURITY



Space-based systems provide a complete and timely picture of military activities that can help decision-makers to respond more quickly and effectively to potential security risks. Space-based communication networks revolutionize military coordination and response time by seamlessly connecting military personnel and equipment across the globe.”

John Kedar, Advisor

Geospatial Infrastructure, Geospatial World and Former Commander, Joint Aeronautical and Geospatial Organization



The geospatial market is undergoing rapid and diverse changes. The users could conveniently encompass all data captured by geospatial satellites and other locational sources. In addition to the traditional visual spectrum, the range of geospatial capabilities has expanded to include synthetic aperture radar, radio frequency data, hyperspectral and infrared imaging, and a vast amount of non-imagery-based geospatial data.”

Chirag Parikh

Deputy Assistant to the President and Executive Secretary National Space, US (Video Message)



A critical aspect of space infrastructure lies in the ground operations, which encompass the infrastructure and people involved. Therefore, it is crucial to allocate appropriate investments towards both ground and space infrastructure. Additionally, emphasis needs to be placed on the significance of implementing national policies in the geospatial era, taking into account the integration of space, AI, and other emerging technologies.”

Gary Dunow

Senior Director, Maxar, USA



In the Indo-Pacific region, countries are converging and fostering collaboration, sharing their national interests not only in the realm of space but also in military endeavors. Though there are challenge related to integration and collaboration among nations but the hybrid geo-intelligence serves as the sole approach that unifies all nations.”

Lt Gen PJS Pannu PVSM, AVSM, VSM(Retd)

Head of Aerospace Division, SATCOM, India





With our growing dependencies, our vulnerability increases accordingly. Establishing a robust and resilient space infrastructure becomes of utmost importance. It is crucial to invest in the development of new technologies for the defense sector, integrating space technologies into military operations, and initiating collaborations with partners to formulate military space strategies.”

Brig G Manoj
Defence Space Agency, India



Combining autonomy, Global Navigation Satellite System (GNSS) technology, and robotics enables creation of a seamless collaboration of work between humans and machines. Humans provide decision-making capabilities, adaptability, and expertise, while autonomous systems equipped with GNSS technology offer precision and efficiency.”

John Whitehead
Senior Director of Sales and Distribution – APAC, Trimble



The Ukraine-Russia conflict has shed light on the emergence of escalating security threats, including nuclear attacks and cyber threats, and the means by which our new concepts and technologies capture these risks. These shared challenges necessitate a robust and comprehensive approach. To effectively address these looming threats, it is imperative to foster collaborations and partnerships among nations in the Indo-Pacific region. Such cooperative efforts are vital to meet the demands of the present time.”

Giuseppe Nobile
Head, Geospatial Section, SITCEN NATO HQ, Belgium



CYBER SECURITY AND DATA SOVEREIGNTY



In this new era, a concerning trend has emerged where cyberattacks often precede physical attacks. It is crucial to widely adopt the term “cybertonics,” which refers to the convergence of cyber warfare and electronics. If hackers can gain access to electronic systems, they can then launch cyberattacks. The supply chain faces significant threats in the form of malware, ransomware, and denial-of-service attacks.”

Lt General (Dr) Rajesh Pant, PVSM, AVSM, VSM (Retd)

National Cyber Security Coordinator at the National Security Council Secretariat, India



Prior to NIST’s assessment (CVSS), cyberattacks exploit 9.2% of discovered vulnerabilities and 49.46% of known vulnerabilities. Artificial intelligence (AI) plays a crucial role in cyber defense, encompassing areas such as malware analysis and detection, assessment of corporate risk posture, safeguarding intellectual property, and preventing data breaches. In the future, the significance of AI will continue to expand, particularly in generating and identifying phishing messages, constructing attack graphs, and enhancing malware detection capabilities.”

VS Subrahmanian

Walter P. Murphy Professor of Computer Science, Northwestern University Evanston, USA



Data sovereignty, often viewed as an oxymoron, necessitates examining how data is safeguarded within a country. It is crucial to assert data sovereignty, which entails preventing data leakage beyond national borders. Comparing data to petroleum, its true value emerges when it is refined and processed, rather than remaining a raw, unutilized resource. Simply claiming data sovereignty while possessing vast amounts of unprocessed data holds little significance for national wealth creation.”

Commander Mukesh Saini (Veteran)

Former National Information Security Coordinator (NSCS/GOI), India





Technology is for humankind and should be used for the welfare of human beings. Technology cooperation and protocols should be there across borders. Attempts to made to set a clear objective for regulators to formulate a business-friendly, unambiguous, and strict policy environment for the data centre business in India.”

Vinit Goenka

Secretary, Centre for Knowledge Sovereignty, India



Data integrity, the risk of unauthorized access, and data security concerns pose significant challenges. Our current state of cybersecurity adoption lags behind, necessitating prompt action. It is crucial to explore the potential of emerging technologies such as generative AI or chatGPT to enhance data protection measures and mitigate risks associated with unauthorized access. Leveraging these innovative solutions can fortify our defense against data breaches and ensure the integrity and security of sensitive information.”

Vikas Tiwari

Head of Solutions Architecture, Government Business, AWS India



SPACE INFRASTRUCTURE AND GEOINT STRATEGY: WAY FORWARD



Advancing Indo-Pacific vision requires an integrated effort that recognizes the critical linkages between economics, governance, and security – all fundamental components that shape the region’s competitive landscape. The entire region is likely to become an increasingly competitive space in terms of sovereign territory claims, resource exploitation, infrastructure development and unfettered access. Hence --- a shared vision.”

Anamika Das

Vice President, Geospatial World, India



Currently, there is insufficient evidence to establish a direct link between climate impacts and migration patterns. However, it is important to acknowledge that climate change can act as a catalyst for migration in regions where pre-existing conflicts or tensions already exist. In such situations, the effects of climate change can exacerbate the challenges and contribute to population displacement.”

Dr Shailesh Nayak

Director, NIAS and Board member In-Space, India



The space industry has emerged as a crucial facilitator in addressing the issue of non-performing assets and minimizing redundancies within global economies. India, as a frontrunner in the space sector, possesses the capability and capacity to lead in this regard. It is imperative to develop a comprehensive national action plan that outlines the establishment of asset-driven space programs for the advancement and prosperity of the country.”

Arpan Sahoo

Co-founder and COO, KaleidEO, India



To maximize the potential of space infrastructure, it is essential to adopt various measures including enhancing Space Situational Awareness (SSA), embracing emerging technologies, investing in cybersecurity, establishing a comprehensive National Space Regulation, advocating for arms control in space, fostering commercial innovation, promoting collaboration and cooperation, and prioritizing resilience and redundancy in space operations.”

Brig. Gen. Datuk Abd Razak

Director, Defence Intelligence Application, Malaysian Space Agency (MYSA)



GEOINT: ACCELERATING DECISION ADVANTAGE (SENSORS TO SHOOTERS)

Key takeaways

- Geospatial building blocks play a pivotal role in the military system by addressing the critical need to synchronize and integrate colossal amounts of data originating from a myriad of sources and presented in various formats.
- Collaboration and synergy among these three entities- industry, academia, and users are essential to drive innovation, technological advancements, and socio-economic growth. This synergy will lead to the development of cutting-edge technologies like metaverse, blockchain driving progress ranging from defense to security.
- An integrated geospatial infrastructure with an enterprise approach to connect foundational data and satellite images, offers a comprehensive solution to geospatial challenges, and empowers organizations to better understand and manage their geospatial assets and resources.
- Spatial analytics platforms provide valuable tools and capabilities to determine Point of Interest movement activities and establish relationships with other individuals through both unstructured and structured data providing actionable intelligence.
- GEOINT offer a valuable framework for structuring and connecting SAR (Synthetic Aperture Radar) analysis with D&I (Detection and Identification) requirements. GEOINT principles, which emphasize the fusion of geospatial data, imagery analysis, and intelligence, SAR analysis can be effectively integrated into the larger D&I process.
- Quantitative (vectorial) results play a fundamental role in comparing SAR (Synthetic Aperture Radar) results, typically represented in raster format, with other sources of intelligence, such as OSINT, SOSINT, and SIGINT.
- Advanced results obtained through active targets (ATR) and activity parametrization enable analysts can gain deeper insights into complex phenomena and enhance the effectiveness of intelligence analysis and operational planning.
- While techniques used for cloud reduction, particularly those based on Generative AI, have proven effective in removing clouds and enhancing the visibility of underlying features, they do face challenges in preserving temporal features.



SITUATIONAL AWARENESS: SPACE, MARITIME AND LAND

Key takeaways

- Synchronization of datasets empowers military operations with enhanced situational awareness, informed decision-making, and efficient resource allocation, ultimately contributing to mission success and operational effectiveness.
- Holistic approach allows for the synthesis of both textual information and spatial data, enhancing situational awareness and providing valuable insights into the POI's activities and networks and uncover hidden relationships, identify emerging threats, and generate actionable intelligence to support law enforcement, security, and defense operations.
- Structured analyses facilitating the identification of correlations can be remarkably fruitful when applied to large areas to enhance situational awareness and unlock valuable insights, and gain a comprehensive understanding of the landscape.
- Maritime Security encompasses various dimensions such as Maritime Situational Awareness (MSA), law enforcement, maritime safety, maritime environment, public health etc. Achieving Maritime Security requires a comprehensive “whole of government” approach wherein all relevant government agencies must collaborate and coordinate their efforts to address the diverse aspects of maritime security effectively.
- Cooperation and collaboration with like-minded countries in a multi-national environment are crucial to achieving common maritime security objectives. Maritime security challenges often transcend national borders and require collective efforts for effective mitigation.
- MSA provides the situational awareness necessary to implement proactive and effective security measures, thereby forming the fundamental basis for ensuring Maritime Security.
- Space Situational Awareness has emerged as a vital field that combines various advanced technologies, including satellite imaging and the Internet of Things (IoT), to provide crucial information for a wide range of applications. It involves monitoring and understanding the space environment, including the positions, trajectories, and characteristics of space objects such as satellites, debris, and potential threats.
- By harnessing the power of modern technologies, space situational awareness plays a pivotal role in enhancing safety, security, and efficiency across multiple sectors that rely on space-based assets and services.
- As traditional SAR providers near the end of their lifespans, NewSpace entrants have begun building large fleets of small satellites to address non-traditional markets beyond military and security. This leaves the largest segment of the market in need of exquisite wide-swath SAR data.



EFFECTIVE BORDER SECURITY

Key takeaways

- Enabling Tactical Geospatial Intelligence (Tac Geo Int) with other intelligence disciplines enhances the overall operational intelligence picture, facilitating coordinated and synchronized actions and empower tactical operators with the knowledge and tools they need to achieve mission success and maintain a competitive advantage in complex operational environments.
- Ensuring the resilience of space and aerial assets is of paramount importance in modern defense and security strategies. The use of camouflage, concealment, and deception techniques can help protect space and aerial assets by minimizing their visibility and susceptibility to adversary actions.
- Integrated systems that encompass land devices, aerial and space sensors, and geospatial data are indispensable components for modern defense operations. By leveraging integrated systems, defense forces can optimize their capabilities, minimize vulnerabilities, and maintain a proactive stance in safeguarding national security.
- When it comes to defense operations, having an IT network that is compatible with weapon platforms and format agnostic is crucial to maximize the utilization of their resources, enhance coordination among different assets, and streamline operations in dynamic and high-stakes environments.
- In the realm of defense, AI-driven analytics, particularly change detection, plays a significant role in maintaining situational awareness and identifying critical developments. It enhances the overall intelligence empowering to stay ahead of adversaries and maintain a proactive defense posture.
- With increasing number of space-borne platforms, the burden of computational processing on ground-stations is becoming humongous. Data processing and computation on-board satellites in space is challenging due to factors such as high-power consumption and latency to process the data. However, benefits of processing data in-space outweigh its challenges. In-space processing will enable transmission of only valuable insights rather than redundant or unimportant pixels.
- Addressing the technical challenges associated with geospatial sensor integration is crucial for effective data utilization. This involves developing algorithms and methodologies to fuse and harmonize data while preserving its integrity and quality.



COUNTER TERRORISM AND PUBLIC SAFETY

Key takeaways

- Collaboration with friendly foreign countries, within the framework of being a major defense partner (MDP), holds immense significance. Such partnerships will provide a platform for fostering strong alliances, sharing knowledge, and promoting technological cooperation.
- Collaboration between defense agencies, government bodies, and private sector stakeholders is crucial in enhancing cybersecurity protocols, conducting regular risk assessments, developing contingency plans, and establishing effective incident response mechanisms.
- Leveraging advanced technologies like AI-driven threat detection systems, real-time monitoring, and predictive analytics can help identify and address vulnerabilities proactively.
- The organization to continuously adapt and innovate and needs investing in training programs, technological advancements, and international partnerships to stay ahead of the evolving tactics employed by criminal networks and counter the threats posed by the flow of illicit activities, safeguarding national security and public welfare.
- The fight against the flow of money, drugs, human trafficking, fake currency, counterfeit documentation, and immigration frauds presents an array of emerging challenges for defense organizations. These illicit activities pose significant threats to national security, public safety, and social stability, requiring comprehensive and coordinated efforts to combat them effectively.
- To counter 'Dirty' bombs and CBRN (Chemical, Biological, Radiological, and Nuclear) terrorism organizations to employ a multi-layered approach that includes prevention, detection, mitigation, and response strategies. Public awareness and education programs are also essential to empower citizens.
- Blockchain technology has the potential to enhance counter-terrorism efforts by improving information sharing, tracking illicit financing, strengthening identity management, and securing supply chains.



DISASTER MANAGEMENT

Key takeaways

- Open data has emerged as a powerful tool in improving disaster management by providing access to timely and comprehensive information to response agencies, governments, and the public. It enables real-time situational awareness by providing up-to-date information about the disaster's location, magnitude, and impact.
 - A space integrated computing network enables near real-time communication with satellites in orbit. This innovative system allows for seamless and efficient data exchange, enhancing the speed and accuracy of disaster response efforts.
 - Defence Technology Institute integrated three target technologies namely military simulation and training, information and communication, and unmanned vehicle to come up with an application for military assistance in time of communication blackout.
 - A Common Operating Picture for disaster management is an integrated and shared situational awareness platform that provides real-time information and visual representation of the operational environment during a disaster or emergency response.
 - Interoperability plays a crucial role in effective disaster management as it improves communication and command capabilities.
 - Geospatial Knowledge Infrastructure (GKI) is essential for integrating geospatial data and technology into the wider digital ecosystem.
- It provides a blueprint for managing and sharing geospatial information and facilitates knowledge co-creation.
- Greater efficiency through task automation is a significant benefit of bringing innovation and technology into the geospatial sector.
 - Continuous professional development programs need to be implemented to ensure that individuals working in the geospatial sector are up-to-date with the latest advancements and possess the skills required to leverage them effectively.
 - The challenge of technology integration and stakeholder coordination in the context of implementing early warning systems at the local scale and conducting nationwide disaster risk reduction training is significant.
 - Data latency is a challenge that arises when utilizing satellite imagery and remote sensing data for disaster management through initiatives like the International Charter Space and major disasters.
 - The integration of geospatial technologies with other frontier technologies is revolutionizing the field of disaster management. One notable example is the use of ChatGPT in the recent earthquake response in Turkey. It assisted in processing vast amounts of textual data, including social media posts, news articles, and emergency reports, to extract relevant information and generate actionable insights in real-time.



CYBERSECURITY THREATS

Key takeaways

- A robust IT network is of paramount importance for defense organizations, ensuring secure communication, reliable data transfer, and effective operations.
- One crucial aspect of such a network is the Secure Direct Downlink (SDD), which provides a highly secure and encrypted channel for transmitting sensitive information between defense systems.
- Hardware Control Point (HCP) system to monitor and manage all connected devices, ensuring their integrity and preventing any unauthorized modifications or access attempts.
- By integrating Secure Direct Downlink,

Hardware Control Point and visualization into a robust IT network, security organizations can significantly enhance their security posture and operational effectiveness.

- An IT network to be designed to have the ability to break down the network infrastructure into independent and interchangeable components. It should encapsulate various network functions and applications within standardized containers, which can be easily deployed and managed. This allows for rapid assembly and disassembly, ensuring flexibility in adapting to changing operational requirements and facilitating efficient transportation.



SATELLITE COMMUNICATION

Key takeaways

- Hybrid satcom are built on open standards and have been shown to deliver the greatest performance in some of the most challenging geographic regions and operating environments in the world.
- The convergence of Satellite Communications and geospatial technologies enables the seamless exchange of data and

communication across vast distances, bridging the gap between remote locations and decision-makers.

- New space era by augmenting world's information use via space will provide autonomous & inter-networking satellites that are optimized for efficient and reliable delivery of customers' space-related data.



SPACE+GEOSPATIAL+4IR FOR SECURITY AND SAFETY

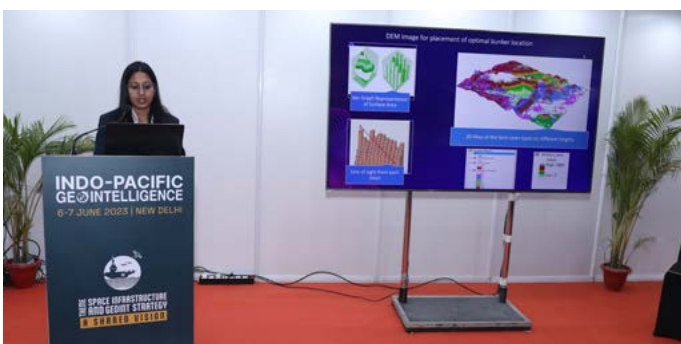
Key takeaways

- By merging the vantage point of satellites with real-time data from IoT devices, we unlock a remarkable era of real-time insights with unprecedented accuracy and will gain a comprehensive understanding of the world like never before.
- From advanced object detection to predictive analytics, the fusion of AI with data analysis empowers us to identify patterns and trends, providing actionable insights that redefine the boundaries of what's possible.
- Unveiling hidden layers of data by expanding to more dimensions allows us to explore our environment with unparalleled depth and uncover valuable insights.
- Easy-to-use interface that caters to all end user needs, offering a range of valuable features. With its automated capabilities, users can streamline their workflows by setting up repeat tasks to monitor specific point targets across the globe.

TECH, FUSION AND R&D FOR MARITIME, BORDER AND PUBLIC SAFETY

Key takeaways

- One of the significant challenges of the region is ensuring that no dark ship goes undetected in the maritime area adjoining the Indian Peninsula. To address this challenge, gathering information from a combination of ships' radars, surveillance aircraft, UAVs, and space-based surveillance systems becomes crucial.
- Counter Drone Electronic Attack is a crucial method employed to neutralize unauthorized drones, and it primarily involves the use of a multi-spectrum drone jammer. This specialized device inhibits the telemetry, communication, and navigation channels of the targeted drone, effectively rendering it immobile and preventing it from carrying out any malicious activities.
- INDigenization and practical goals play a crucial role in driving innovation and self-reliance in India. One significant area where this approach has yielded remarkable results is in the development of smart fencing systems utilizing WSN (Wireless Sensor Network) based ground sensor networks.
- Enhancing training using AI in the Metaverse involves considering various parameters to optimize the learning process and improve user experiences like personalization is crucial, as AI algorithms can tailor training content and experiences based on individual user preferences, skills, and goals.
- The need for technology fusion arises from the increasing complexity and interconnectivity of our modern world. By integrating different technologies, we can harness their collective strengths and capabilities to tackle multifaceted challenges more effectively.



OPEN HOUSE: SPACE INFRASTRUCTURE AND GEOINT STRATEGY: A SHARED VISION

Key takeaways

- Indo-Pacific is a critical region globally. Every country has a lot of interest in Indo-Pacific region, especially from supply chain point of view.
- Growth and Security are the two Commonly Shared Vision wherein new generation warfare extends beyond security parameter.
- Security is not limited to borders, it's very much an economic issue. Through cohesive thinking, like-minded countries can partner and develop common goals, which over time will translate into a shared vision.
- A safe, shared, secured Geoint infrastructure will also contribute to climate security, health security, border security, food security and supply chain security.
- There's an entirely new industry within geospatial industry that's focused on 'answers-as-a-service'. This ecosystem of relatively small startup-type organizations focuses on fusing information for specific purposes and specific use cases.
- Global security cannot be managed/led by one. Collaboration and sharing is important, but not everything can be shared. Developing a common environment and deciding the extent of data sharing will help. An example from Dubai Pulse, a data sharing platform:
 - Level 1: Open to Public
 - Level 2: Open to Industry, not Public
 - Level 3: Open to specific Government Officials
- Regular dialogues between industry and end-users are required to understand user needs.
- There needs to be a paradigm shift in sharing, and explore new form of sharing, for example information barter, etc.
- Government should focus on policy, and let private sector do the business. Private sector will create products that are value for money. It is risk reduction for the government.
- Like-minded countries should support each other in terms of expertise and resources. For Indo-Pacific countries, QUAD is a good starting point.



PARTNERS PROGRAMS: SUSTAINABILITY & SECURITY OF SPACE INFRASTRUCTURE



Key takeaways

- Space sustainability is a collective responsibility that transcends borders and affects the future of our planet and the progress of humanity. It is essential for all individuals, organizations, and nations to care about and actively contribute to ensuring space sustainability.
- Space sustainability aligns with broader sustainability goals on Earth, as space-based applications contribute to various sectors. By nurturing a sustainable space environment, we can harness the full potential of space for the betterment of humanity while ensuring a sustainable future for generations to come.
- ASAT (Anti-Satellite) tests pose a pressing threat to the security and sustainability of outer space activities. Recognizing this, the United States has taken a proactive step by unilaterally committing to a moratorium on destructive direct ascent anti-satellite missile tests.
- By fostering international cooperation and establishing binding agreements, we can address the pressing threat of ASAT tests, ensure the security of space assets, and safeguard the long-term sustainability of outer space activities.
- Adhering to best practices, norms of behavior, data exchange standards, transparency, and guidelines set forth by organizations is crucial for space operations. These guidelines and treaties provide a framework for responsible and sustainable space activities.
- Collaboration and adherence to the established standards help prevent conflicts, enhance coordination among space actors, and promote the safe and efficient use of space resources.
- By promoting dialogue and collaboration among diverse stakeholders, Secure World Foundation (SWF) seeks to create a shared understanding and collective effort towards the responsible and inclusive utilization of space resources.
- The growing collision threats of space objects, including orbital debris, with operational space assets have emerged as a persistent problem in the realm of outer space. The presence of orbital debris poses a risk to satellites, spacecraft, and other vital assets in orbit, potentially leading to collisions that can generate even more debris, exacerbating the problem.
- To preserve the long-term viability of outer space activities, ensure unhindered access to space, and foster the safe and sustainable use of this valuable domain it is crucial for all space actors to take appropriate measures. This includes implementing strategies to track and monitor space objects, improving space debris mitigation practices, and fostering international cooperation to develop standardized guidelines and protocols.



1st India Australia Space & Geospatial Business Summit

- There is a need for enhanced collaboration between Indian and Australian authorities to foster commercial space and geospatial businesses between the two countries.
- India and Australia share mutual concerns such as climate change and disaster management, which necessitate partnership and collaboration between their respective space organizations.
- Indian space and geospatial organizations should proactively participate in Australia to strengthen the connection.
- Strengthening the partnership can lead to the creation of a large and efficient supply chain.
- Australia's development of a healthy space ecosystem presents significant opportunities for collaboration between commercial space organizations from both countries.
- The India-Australia ECTA (Economic Cooperation and Trade Agreement) can be valuable for promoting cooperation in the space business between the two nations.
- Indian space organizations can contribute to Australian efforts in forest management and flood control, addressing some of the main concerns in Australia.



Knowledge Partner



Supporting Partner



Organizer



2nd India Japan Space & Geospatial Business Summit

- There is a need for building on each other's capabilities.
- Both the countries should engage in strategic bilateral dialogue on leveraging on the recent Geospatial Policy, Drone Policy and Space Policy in India.
- There is a need for bringing more Industry participation in policy deliberations.
- The Summit also emphasised on strengthening Trade and Commerce between the two countries, strengthening the Export and Import ecosystem, Ease of Doing Business, Collaboration and Co-operations.
- The participants emphasised on Regional Collaborations, adopting the 'Selling to, Selling with and Selling through' approach among many issues.
- There is a need at the administrative level to address bureaucratic challenges between India and Japan in the field of space businesses.
- Both countries share mutual concerns and challenges that can be addressed through collaboration between Indian and Japanese space and geospatial organizations.
- The Indian space and geospatial sector need opportunities to establish connections in Japan for collaboration purposes.
- There is a significant opportunity for Indian space and geospatial organizations to offer geospatial services, GNSS equipment, and LiDAR services in Japan.
- Indian businesses should have access to a common platform in Japan to facilitate potential collaborations and ease of doing business.



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Japan External Trade Organization

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3rd India USA Space & Geospatial Business Summit

- There is a need for building on each other's capabilities.
- There is a growing relevance of Geospatial and Space in global economy and development and there is a need of integrated approach towards Geospatial and Space.
- The commercial space and geospatial sectors in India and the United States should prioritize and collaborate in the marine sector.
- Collaboration between Indian and American space organizations is crucial in the field of climate services.
- It is important to consider language barrier concerns and cultivate the right mindset when promoting collaboration in the space sector between both countries.
- India should shift its focus from being a service provider to becoming a product provider.
- Both countries should collaborate in establishing a multi-domain, multi-technology, and multi-platform framework to expedite execution and ground facilitation.
- Open innovation, co-innovation, and technology transfer between the two countries are necessary.
- There is a need for a more proactive role from both governments to foster strategic and tactical engagements in the space and geospatial sectors and strengthening regional collaborations.
- Leveraging on the recent Geospatial Policy, Drone Policy and Space Policy in India.
- Bringing more Industry participation in policy deliberations.
- Strengthening Trade and Commerce between the two countries, strengthening the Export and Import ecosystem, Ease of Doing Business, Collaboration and Co-operations



Co-Organizer



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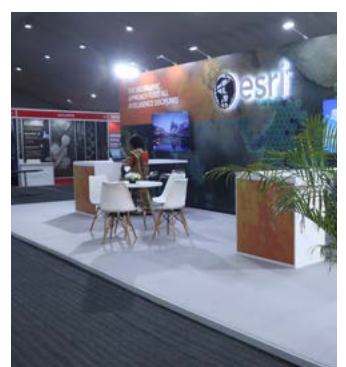
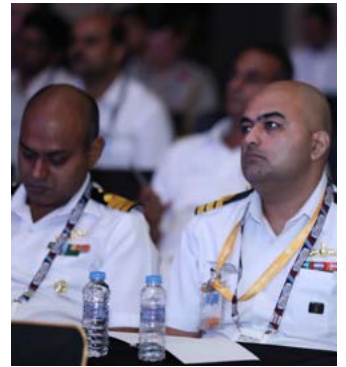
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EXHIBITORS



AT A GLANCE



PARTICIPATING ORGANIZATIONS

Government

- ADRIN
- Antrix Corporation Limited
- Armed Forces
- Army AD College
- ARMY HEADQUATER
- Arunachal Pradesh Police
- BPR&D
- BSF
- Cabinet Secretariate
- CBI
- Center for Artifical Intelligence & Robotics (CAIR)
- CISF
- CME, ARTRAC
- CRPF
- Defence Cyber Agency
- Defence Geoinformatics Research Establishment (DGRE)
- Defence Image Processing and Analysis Centre (DIPAC)
- Defence Intelligence Agency (COORD)
- Defence Research and Development Organisation (DRDO)
- Defence Space Agency
- Defence Technology Institute
- Delhi Police
- Department for Promotion of Industry and Internal Trade (DPIIT)
- Department of Defence
- Department of Science & Technology
- Department Survey and Mapping Malaysia
- DG Army Aviation
- Directorate General Assam Riffles (DGAR)
- Directorate of Coordination Police Wireless
- Directorate of Forensic Science Services(DFSS)
- Directorate of Network Centric Operations. ACNS(FCI)
- Geospatial Information Agency (BIG), Indonesia
- Indian Air Force
- Indian Army
- Indian Coast Guard
- Indian National Space Promotion and Authorisation Centre (IN-SPACE)
- Indian Navy
- Institute for Systems Studies & Analyses (ISSA)
- ITBP
- J&K Police
- Maharashtra Police
- Malaysian Institute of Defence and Security (MiDAS)
- Malaysian Space Agency (MYSA)
- Meghalaya Police
- Military Survey
- Ministry of Commerce & Industry
- Ministry of Defence
- Ministry of Health and Family Welfare
- Ministry of Home Affairs
- National Remote Sensing Centre
- National Security Council of Malaysia
- National Security Council Secretariat
- National Security Guard
- National Technical Research Organisation (NTRO)
- NATO
- Naval Physical & Oceanographic Laboratory (NPOL)
- National Disaster Response Force (NDRF)
- Office of Defense Cooperation
- Philippine Space Agency
- Royal Thai Embassy
- Sashtra Seema Bal
- Solid State Physics Laboratory (SSPL), DRDO
- South Australia State Emergency Service

Technology Providers

- Aeron Systems Pvt. Ltd.
- Albright Stonebridge Group
- AllTerra India
- Amazon Web Services
- Arzuh International
- ASC Center and College
- Astroscale Japan
- AugSenseLab
- AWS India
- Axelspace Corporation
- Azista Industries Pvt Ltd
- BEL
- Bellatrix Aerospace Private Limited
- BlackSky
- Canon India Pvt Ltd
- Capella Space
- C-Astra Technologies
- CDOT
- CI Metrics
- COMSPOC Corp
- Comtech Telecommunications
- CV India
- CYRAN AI
- CYRAN AI Solutions
- Digantara
- EARTHDAILY ANALYTICS
- EarthSight Foundation
- Elmack
- Esri Inc
- Esri India
- EXCEL GEOMATICS PVT LTD

- GalaxEye Space Solutions Pvt Ltd
- Garuda Aerospace Private Limited
- Genesys International Corporation Ltd.
- GEOSAT
- GLODAL, Inc.
- Google
- HawkEye 360
- Heliware
- Hexagon Autonomy & Positioning
- Hexagon India
- ICEYE
- IDC Technologies
- iGeo Consultants LLP
- IIC Technologies
- KaleidEO
- Kepler Aerospace
- Knowledge Spatial
- Location Mind
- MAP2U SDN BHD
- MAXAR Technologies
- Mayakshi
- MicroGenesis TechSoft Pvt Ltd
- Micronet Solutions
- Nascent Info Technologies
- Pan India Consultants Pvt Ltd
- Panasonic
- Perpetual Block
- Planet Labs
- QL Space
- QuantaSIP Geomatic Informative Solutions Pvt Ltd
- ReOrbit
- RMSI Ltd.
- Rotten Grapes Pvt. Ltd.
- RSI LLP
- sarmap sa
- Satellogic
- Satlab Geo solutions
- Satlantis
- SATPALDA
- SatSure
- SatVu
- Scanpoint Geomatics Ltd
- SECON
- SI Imaging Services
- SkyServe (Hyspace Technologies)
- Solution Architecture
- SpaceAlpha Insights
- Suhora Technologies
- Synspective Inc.
- TATA Advanced Systems
- Tech Mahindra Ltd.
- The Cardillo Group
- The Takshashila Institution
- Third Wave Ruggedtech Pvt. Ltd.
- Topcon Positioning Asia Co.,Ltd
- Trimble
- UMBRA
- Upgraha Space Technologies
- Ursa Space Systems
- Vasundharaa Geo Technologies Pvt ltd
- VTOL AVIATION INDIA PVT. LTD.
- WARPSPACE Inc
- Centre for Policy Research
- CLRR (Centre for Labour Rights & Reforms)
- Delhi Policy Group
- ELCINA
- Electronics Sector Skills Council Of India (ESSCI)
- EY
- I.L.A.
- Indian Space Association (ISpA)
- Institute for Defence Studies and Analyses
- Janus Trading Company
- JETRO
- National Maritime Foundation(NMF)
- Secure World Foundation
- SIA India
- United States - India Business Council
- Geospatial World Chamber of Commerce
- Center For Land Warfare Studies (CLAWS)
- CENJOWS

Academia

- BITS pilani
- COEP Technological University
- IIT Delhi
- National Institute of Advanced Studies
- Rashtriya Raksha University
- Shreejee Academy
- University of Kerala
- University of New South Wales in Canberra (at the Australian Defence Force Academy)
- UNSW India Centre
- Northwestern University

Associations, Think Tank and Consultants

- Association of Geospatial Industries
- Center of Excellence-IoT & AI (NASSCOM)
- Centre for Airpower Studies
- Centre for Knowledge Sovereignty
- Centre for Military Airworthiness and Certification (CEMILAC)

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