समाचार पत्रों से चयित अंश
Newspapers Clippings

दैनिक सामयिक अभिज्ञता सेवा

A Daily Current Awareness Service

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Kusumgar partners with DRDO
for manufacturing parachutes

Mumbai: Kusumgar Corporates, a manufacturer of technical textiles in India, has proudly partnered with DRDO and acquired the TOT (Transfer of Technology) for manufacturing of Combat Free Fall (CFF) Parachute system in India.

The TOT was handed over to the Managing Director Siddharth Kusumgar during the DEFEXPO by the Chairman of DRDO Dr G Satheesh Reddy in the presence of Honorable Defence Minister Sh. Rajnath Singh and Honorable Chief Minister of Uttar Pradesh Sh. Yogi Adityanath. "We have always been focused on building strong capabilities within India to support our defence establishment and reduce dependence on imports. This is an important step in that direction," Siddharth said.

CFF parachute system provides total solutions to Paratrooper for jumping from a height as high as 30,000 ft., can glide up to 30 km range and can land at the desired target. It can be used in High Altitude High Opening (HAHO) as well as in High Altitude Low Opening (HALO) modes.

Kusumgar has been working with DRDO for several years and has partnered with them in development of various solutions to meet the needs of our armed forces. According to Ankur Kothari, CEO, "In the future as well, Kusumgar will continue to enhance their strengths in the manufacturing of specialised products by bringing latest technology to serve the country better."

Kusumgar Corporates is a pioneer in Technical Textiles in India. Established in 1970, Kusumgar has proven credentials in the arena of specialized textiles with a comprehensive range of textiles for a wide spectrum of applications. Over the decades, the company has delighted customers with a diverse range that includes: Cordura fabrics, Custom fabrics, Geo-synthetics, Recreational fabrics, Parachute fabrics, Protective fabrics, Ballistic fabrics, Filter fabrics, Parasail fabrics, Impression fabrics, and Medical textile fabrics.

https://www.textileworld.com/textile-world/nonwovens-technical-textiles/2020/02/kusumgar-partners-with-drdo-for-manufacturing-parachutes/

नौसेना को पनडुब्बीरोधी युद्धपोत 'कवरत्ती' मिला

कोलकाता : सार्वजनिक क्षेत्र के रक्षा उपक्रम गार्डेनरीच शिपबिल्डर्स एंड इंजीनियर्स लिमिटेड (जीआरएसई) ने मंगलवार को भारतीय नौसेना को पनडुब्बीरोधी युद्धपोत आइएनएस 'कवरत्ती' सौंप दिया।

रडार की पकड़ में नहीं आने वाले इस स्वदेशी युद्धपोत मिलने से नौसेना की ताकत और बढ़ेगी। युद्धपोत में 17 अधिकारियों और 106 नाविकों के बैठने व रहने की पूरी व्यवस्था है। इस युद्धपोत का डिजाइन नौसेना डिजाइन निदेशालय द्वारा किया गया है।

कोलकाता में जीआरएसई के मेन यूनिट में आयोजित एक कार्यक्रम में वरिष्ठ अधिकारियों व अन्य गणमान्य लोगों की उपस्थिति में इसे नौसेना को सौंप दिया गया। इस मौके पर जीआरएसई के अध्यक्ष सह

प्रबंध निदेशक रियर एडमिरल (रिटायर्ड) वीके सक्सेना ने बताया कि कवरत्ती उन चार पनडुब्बीरोधी लड़ाकू युद्धपोतों में से अंतिम है, जिसका निर्माण जीआरएसई ने परियोजना पी-28 के तहत भारतीय नौसेना के लिए किया है।

https://epaper.jagran.com/epaper/19-feb-2020-4-delhi-city-edition-delhi-city-page-14.html#

the pioneer

Wed, 19 Feb 2020

GRSE delivers 4th anti-submarine warfare corvette to Navy

Kolkata: Defence PSU Garden Reach Shipbuilders and Engineers Ltd (GRSE) on Tuesday delivered its fourth anti-submarine warfare stealth corvette to the Indian Navy, an official said.

Kavaratti was the last in the series of four anti- Submarine Warfare Corvettes (ASWC) built by Kolkata-based GRSE under Project 28, he said.

The first three ships of the series - INS Kamorta, INS Kadmatt and INS Kiltan -were delivered earlier, and form an integral part of Eastern Fleet of the Indian Navy, the GRSE official said.

They have been engaged in several overseas operations and international maritime exhibitions in Malaysia, Singapore and other countries, the official said.

Project 28, approved in 2003, is a class of anti- submarine warship corvettes currently in service with the Indian Navy. The corvettes are named after islands in the Lakshadweep archipelago.

INS Kiltan recently participated in the prestigious Exercise Malabar 2019, an endeavour to strengthen India- Japan-US naval cooperation and enhance interoperability, the official said.

With 90 per cent indigenous content, the P-28 class ships are equipped to fight in nuclear, biological and chemical warfare conditions and featured the integration of a host of weapons and sensors.

These ASW corvettes have catapulted the Indian Navy into the elite club of countries that have built stealth ships, the GRSE official said, adding that the stealth features make the ships almost invisible to the enemy, both above and below the sea surface.

The corvettes - designed as an extremely versatile ASW platform capable of neutralising enemy submarines with indigenous weapons like torpedoes and rocket launchers -- are equally effective in the littorals and deep oceans, the official said.

Capable of attaining a maximum speed of 25 knots, the ship has a length of 109 metres and width of 12.8 metres, he said, adding that it has an endurance of over 3400 nautical miles (NM) at 18-knot speed, and can accommodate 17 officers and 106 sailors.

Kavaratti and INS Kiltan are the first two major warships in the country to have the unique feature of superstructure made of carbon fibre composite material.

It is for the first time in India that such composite material is being integrated with steel hull of a ship, and GRSE is the first shipyard in the country to have successfully achieved this task, the official added.

https://www.dailypioneer.com/2020/india/grse-delivers-4th-anti-submarine-warfare-corvette-to-navy.html

नवभारत टाइम्स

सेना ने M-46 गन को सारंग तोप में बदला, खर्च भी आया कम

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■ **नई दिल्ली :** भारतीय सेना के तोपखाने को और ज्यादा ताकतवर बनाने का काम जारी है। इससे इन तोपों की हमला करने की रेंज भी बढ़ेगी। अब सभी तोपों को 155 एमएम यानी ज्यादा कैलिबर का बनाने की दिशा में एक और अहम कदम बढ़ा है। ज्यादा कैलिबर यानी ज्यादा घातक। ऑर्डिनेंस फैक्ट्री बोर्ड ने एम-46 गन को अपग्रेड कर 155 एमएम का बनाया है। इस आर्टिलरी गन को सारंग नाम दिया गया है। एम-46 गन रूस से ली गई थी। हाल ही में लखनऊ में हुए डिफेंस एक्सपो में पहली सारंग आर्टिलरी गन सेना प्रमुख जनरल एमएम

नरवणे को सौंपी गई। चार साल में सेना को 300 सारंग आर्टिलरी गन मिलेंगी। एम-46 गन की रेंज पहले 27 किलोमीटर थी। अब इसे अपग्रेड कर इसकी रेंज 36 किलोमीटर तक हो गई। पहले यह 130 एमएम की गन थी। अपग्रेड होने के बाद सारंग में 8 किलो के टीएनटी यानी विस्फोटक का इस्तेमाल होगा। जिससे यह और ज्यादा घातक साबित होगी। एक वरिष्ठ अधिकारी के मुताबिक नई आर्टिलरी गन लेने में 7 से 9 करोड़ रुपये का खर्चा आता है। लेकिन पुरानी आर्टिलरी गन को अपग्रेड करने में 75-80 लाख रुपये का खर्चा आया है। चार साल के भीतर 300 एम-46 गन को अपग्रेड कर सारंग में बदला जाएगा।

भारत की ताकत

36 किलोमीटर तक हो गई रेंज

27 किलोमीटर रेंज थी पहले

75-80 लाख रुपये का खर्चा आया अपग्रेड करने में

8 किलो के टीएनटी यानी विस्फोटक का इस्तेमाल होगा

अब एक तरह की तोपें ही होंगी

सेना के एक अधिकारी ने कहा कि तोपखाने में अभी 105 एमएम की फील्ड गन हैं जिन्हें बाहर करने की तैयारी है। अब दुनिया भर में 155 एमएम की आर्टिलरी गन ही बन रही हैं। भारतीय सेना भी अपने तोपखाने को दुनिया के हिसाब से बदल रही है। नवंबर 2018 में सेना को तीन दशक बाद पहली आधुनिक आर्टिलरी गन एम-777 अल्ट्रा लाइट हॉविट्जर मिली थी। यह अमेरिका से ली गई थी। साथ ही साउथ कोरिया से ली गई के-9 वज्रा भी है। यह दोनों 155 एमएम कैलिबर की हैं। सेना के अधिकारी के मुताबिक सभी तोप एक तरह की होने से सब में एक जैसे गोले का इस्तेमाल किया जा सकेगा। इससे गोलाबारूद स्टोर करना भी आसान होगा। साथ ही अगर एक जैसे हथियारों का इस्तेमाल होने से सेना को इसमें विशेषज्ञता भी हासिल होगी। अभी अलग-अलग तरह के गन सिस्टम हैं। सभी एक तरह की होंगी तो इन्हें संभालना ज्यादा आसान होगा।
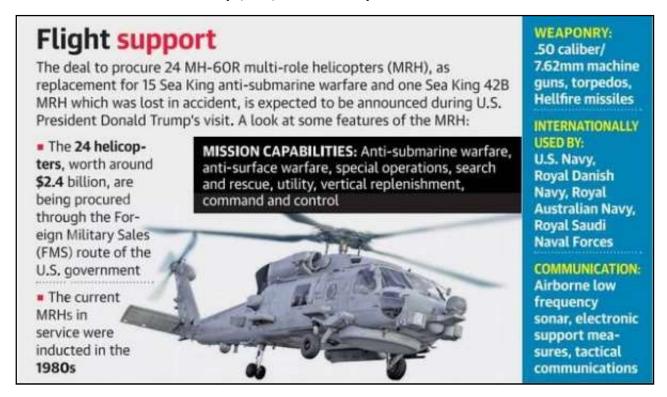
Trump's visit may seal helicopter deal

Defence pacts likely during U.S. President's visit
By Dinakar Peri

New Delhi: The deal for 24 MH-60R Multi-Role Helicopters (MRH) for the Navy, which is likely to be announced during the visit of U.S. President Donald Trump, is lined up for the final approval of the Cabinet Committee on Security (CCS) on Wednesday, official sources said.

Flight support

The deal to procure 24 MH-60R multi-role helicopters (MRH), as replacement for 15 Sea King anti-submarine warfare and one Sea King 42B MRH which was lost in accident, is expected to be announced during U.S. President Donald Trump's visit. A look at some features of the MRH:

- The **24 helicopters**, worth around **$2.4** billion, are being procured through the Foreign Military Sales (FMS) route of the U.S. government

- The current MRHs in service were inducted in the **1980s**

MISSION CAPABILITIES: Anti-submarine warfare, anti-surface warfare, special operations, search and rescue, utility, vertical replenishment, command and control

WEAPONRY: .50 caliber/ 7.62mm machine guns, torpedos, Hellfire missiles

INTERNATIONALLY USED BY: U.S. Navy, Royal Danish Navy, Royal Australian Navy, Royal Saudi Naval Forces

COMMUNICATION: Airborne low frequency sonar, electronic support measures, tactical communications

"The deal is before the CCS for final approval which is meeting on Wednesday. We are hopeful that it will be cleared," a defence source told *The Hindu*. All procedural requirements for the deal have been completed, he added. The 24 Lockheed Martin-built helicopters, worth $2.4 billion, are being procured through the Foreign Military Sales route of the U.S. government.

Trade deal unlikely

Mr. Trump will visit India on February 24 and 25. With no headway in the talks for a trade deal, there are expectations that a few big-ticket defence deals will be announced.

There are several big-ticket deals in the pipeline. These include six Boeing P-8I long-range surveillance aircraft and 13 BAE Systems-built 127-mm MK-45 naval gun systems worth around $1 billion for the Navy, six AH-64E Apache attack helicopters for the Army, 30 armed drones for the three services and a tactical air defence system for Delhi. However, these are at various stages of procurement... "Apart from the deal for MH-60R helicopters, an announcement is possible on P-8I and Apache," a second official source said.

The Navy is facing an acute shortage of MRH, with several warships operating with empty helicopter decks. These helicopters are being procured as replacement for 15 Sea King Anti-

Submarine Warfare helicopters de-inducted in 1991 and one Sea King 42B MRH lost in accident. The MRHs in service, Sea King 42Bs, were inducted in the 1980s and are in need of replacement.

Given the urgency, the U.S. is likely to take some MH-60R helicopters from its newest aircraft carrier, *USS Gerald Ford*, which is undergoing upgrades. "We are hopeful of getting four or five MH-60s from *USS Gerald Ford* once the deal is signed," a Navy official said.

https://www.thehindu.com/news/national/trumps-visit-may-seal-helicopter-deal/article30854024.ece

The Tribune
VOICE OF THE PEOPLE

Wed, 19 Feb 2020

Military deals to further strengthen Indo-US ties
By Ajay Banerjee

New Delhi: As US President Donald Trump heads to India, the two countries which were on opposite ends of the strategic spectrum 30 years ago today have a defence relationship that has emerged as a major pillar of the India-US strategic partnership.

The two countries now conduct more bilateral exercises with each other than they do with any other country. The US has already supplied more than $18 billion worth of weapons and planes to India in the past 12 years. Three more deals worth $7.50 billion (approximately Rs 52,500 crore) are in the pipeline. Binding agreements have been inked which allow deeper alliances.

India is looking to get 24 naval multi-role helicopters from Lockheed Martin for $2.6 billion, the price negotiation has ended and a final contract is expected anytime now.

On February 10, the US Department of State approved a possible sale to India for what is called the Integrated Air Defense Weapon System made by Raytheon. It would cost $1.867 billion and provide an air defence cover over the national capital. These two are coming up immediately while the sale of six more surveillance planes Boeing P8I, costing $3.1 billion, would come up later this year. In the past five years, India has got 145 pieces of the specialised M777 ultra light howtizers.

In June 2016, the US recognised India as a 'Major Defence Partner'. It commits the US to share technology and enter into industry collaboration for defence co-production. Agreements signed since 2016 have cemented ties. The Logistics Exchange Memorandum of Association signed in August 2016 and the Communications Compatibility and Security Agreement inked in 2018 – the two along with BECA — are what the US calls 'foundational agreements'.

Strategic Defence relations to get a boost

- Three defence deals worth $7.50 billion (approximately Rs52,500 crore) are in the pipeline
- An agreement on 24 naval multi-role helicopters from Lockheed Martin for $2.6 billion is also expected soon
- The US has also given the nod to sale of Integrated Air Defense Weapon System worth $1.867 billion

https://www.tribuneindia.com/news/military-deals-to-further-strengthen-indo-us-ties-43721

IDSA renamed after Manohar Parrikar

New Delhi: The Central Government has renamed Institute for Defence Studies and Analyses (IDSA), a Government think tank, as Manohar Parrikar Institute for Defence Studies and Analyses in order to "honour the commitment and legacy" of the late Defence Minister. The IDSA is a non-partisan, autonomous body dedicated to objective research and policy-relevant studies on all aspects of defence and security.

Parrikar was Defence Minister from November 9, 2014 to March 14, 2017. He died last year due to pancreatic cancer. He steered the Defence Ministry "through the tough challenges of attacks like Pathankot and Uri and responded to these with exemplary boldness," said a Government statement on Tuesday while announcing the decision to rename the IDSA.

"An epitome of integrity and dedication in public life, throughout his career, late Parrikar showed a tremendous fighting spirit, taking on the odds with fearlessness," the statement noted.

When Parrikar was the Defence Minister, India witnessed a series of decisions that "enhanced its security capacities, boosted indigenous defence production and bettered the lives of ex-servicemen", it said.

His biggest contribution was towards the implementation of long-standing One Rank One Pension (OROP) demand for the Armed forces, the statement said.

The renaming of the IDSA will align the vision and aspiration of the premier defence institute with the contribution of the former Raksha Mantri, said the statement.

Goa Chief Minister Pramod Sawant said, "I welcome the decision of Defence Ministry to rename IDSA as 'Manohar Parrikar Institute for Defence Studies and Analyses', honoring Manohar bhai's tremendous contribution as Defence Minister of India."

Parrikar's son Utpal termed the renaming of the IDSA after his late father as a "proud moment." He said naming of such a prestigious and important institute (IDSA) of the country after a Goan is a "proud moment for every one of us." He also said only avid followers of Indian defence will get a hint about the magnitude of the Central Government's accomplishment in the field of defence adding, "I am happy that my father played a significant role in this in his short stint as the raksha mantri (Union Defence Minister)."

An autonomous body under Ministry of Defence, IDSA was established as a registered society in New Delhi in 1965, dedicated to objective research and policy relevant studies on all aspects of defence and security.

Its aim is to promote national and international security through the generation and dissemination of knowledge on defence and security-related issues. To achieve its goals, the institute undertakes scholarly research, policy-oriented research, dissemination of research findings, training and capacity building and public education.

https://www.dailypioneer.com/2020/page1/idsa-renamed-after-manohar-parrikar.html

Pakistan successfully tests air launched cruise missile Ra'ad-II

Ra'ad-II weapon system is equipped with state of the art guidance and navigation systems ensuring engagement of targets with high precision

Islamabad: Pakistan on Tuesday conducted a successful flight test of the air launched cruise missile Ra'ad-II with a range of 600 km, the military announced, significantly enhancing the air delivered strategic standoff capability of the military on land and at sea.

Ra'ad-II weapon system is equipped with state of the art guidance and navigation systems ensuring engagement of targets with high precision, according to a press release issued by the Inter-Services Public Relations (ISPR), the military's media wing.

The cruise missile with a range of 600 km significantly enhances air delivered strategic standoff capability on land and at sea, it said.

The successful flight test was witnessed by senior Pakistan Army officers and military officials, the statement said.

Last month, the ISPR said Pakistan conducted a successful training launch of surface-to-surface ballistic missile Ghaznavi, capable of delivering multiple types of warheads up to a range of 290 km.

https://www.business-standard.com/article/pti-stories/pakistan-successfully-tests-air-launched-cruise-missile-ra-ad-ii-120021800803_1.html

How coronavirus is stalling China's military modernisation plans | Opinion

The epidemic has hit the PLA's recruitment drive, and stalled production at weapons manufacturing institutes

By Jayadeva Ranade

The coronavirus epidemic erupted when the slowdown of the Chinese economy had already accelerated because of the trade war with the United States. China's economy has now been further adversely affected, with economists assessing that the growth rate will need to be revised downward to 5%. The country's services sector is estimated to be losing $114 billion a week. At least 22 Chinese provinces and regions, including Beijing, Guangdong, Zhejiang, Henan, Hainan and Fujian, have already set lower growth targets this year compared to the last.

This combined stress on China's economy is poised to dilute the strategic geo-economic Belt and Road Initiative (BRI), a prestige project of the Chinese President Xi Jinping. Investment in BRI has

already dipped. This will dent, if not damage, the credibility of the Chinese Communist Party (CCP) and President Xi who promised to realise the "China Dream" by 2021.

The adverse impact of the coronavirus epidemic on China's military modernisation became visible earlier this month. The People's Liberation Army (PLA) announced, on February 7, that it was suspending its military recruitment programme for the current year.

The new recruitment programme, announced by the PLA in January and scheduled to begin this year, would have had two recruitment cycles. The first phase was to commence in mid-February and continue till the end of March, with the second recruitment cycle running from mid-August to the end of September.

The new programme also provided that military personnel will retire twice a year. This revised programme was described as being "of great significance for recruiting more high-quality soldiers". China's ministry of national defence said it "is of great significance for improving the quality and training of enlistees and enhancing the military's combat capability". While Li Daguang, professor at the PLA National Defense University in Beijing, said the postponement "should not have much effect on the number or quality of the eventual recruits", the decision to suspend recruitment will undoubtedly upset long-term plans and training programmes. It will additionally defer employment, especially for the rural youth, at a time when unemployment has been rising steadily for the last two years.

Equally impactful is the decision of certain vital military centres to slow down production. Early this month, the Jiangnan Shipyard in Shanghai, which is building China's third aircraft carrier, asked employees, who travelled to other cities since the virus outbreak, not to return to work until further notice, or quarantine themselves at home for the stipulated period. This will delay the construction of the new aircraft carrier and could have further knock-on effects.

The impact of the virus in Wuhan, where it originated, will affect China's defence production. Wuhan is home to many Chinese weapons and equipment design and manufacturing institutes, such as the Wuchang Shipbuilding Industry Group, which builds submarines, and the Naval University of Engineering, which is developing advanced naval technologies such as the electromagnetic catapult, rail gun, full electric propulsion, and submarine-related technologies. The research and development headquarters of most Chinese hi-technology companies are also located in Wuhan.

China's production of carrier-based aircraft has also been adversely impacted, with the Shenyang Aircraft Corporation in Liaoning Province deciding to suspend production. Like other enterprises, it has informed its workers who travelled to other cities not to return till further notice, or quarantine themselves at home for the required period. The Shenyang Aircraft Corporation manufactures the J-15 carrier-based fighter jet, which is presently the only jet fighter available to the PLA Navy (PLAN)'s carrier fleet and its mainstay. There is currently a shortfall in the number of J-15 fighter jets available to the PLAN, which wants 36 aircraft on each aircraft carrier, but can provide a maximum of only 24 aircraft. There is also a severe shortage of navy aviation pilots and efforts have been underway to train more pilots and accelerate production of the J-15 aircraft.

The PLAN, which receives the highest share of China's military budget, is tasked to protect China's maritime and overseas interests. Closure of these weapons manufacturing institutes, even though temporary, will delay the PLAN's ambition of becoming an ocean-going fleet and hamper its envisaged role in the Maritime Silk Route (MSR), considered an important part of the BRI.

The severe economic losses that are estimated and visibly growing discontent in society could compel China's leadership to invest in promoting employment and the domestic economy rather than the military. There could be reduced interest in spending on overseas ports viewed as part of the MSR. This is likely to revive the debate going on for the past almost 4 months about the number of aircraft carriers that China needs. The slowdown in military build-up will delay the realisation of the "China Dream".

IIT Mandi hosted a national workshop on advanced composites for aerospace: Design, manufacturing and condition monitoring perspective

Mandi: Indian Institute of Technology Mandi hosted a National Workshop on 'Advanced Composites for Aerospace: Design, Manufacturing and Condition Monitoring Perspective' from 11th to 15th February 2020. Designed especially for researchers and engineers, the workshop helped participants to understand and implement state-of-the-art concepts of design, manufacturing and conditioning monitoring pertaining to advanced composite for aerospace application.

For the workshop, the Institute hosted eminent scientists from Aeronautics Research & Development Board (AR&DB), the aerospace research wing of Defence Research and Development Organisation (DRDO), who provided the exposure to cutting edge research perspectives on composites in the aerospace industry.

The subject experts who delivered lectures in this workshop included:

- Dr. Shailendra N Jaiswal, Executive Director, Ministry of Railway
- Dr. S.K. Pandey, AR&DB, DRDO
- Dr. Himanshu Pathak, Assistant Professor, School of Engineering, IIT Mandi
- Dr. Subhamoy Sen, Assistant Professor, School of Engineering, IIT Mandi
- Dr. Sunny Zafar, Assistant Professor, School of Engineering, IIT Mandi
- Dr. Rajnish Sharma, Assistant Professor, School of Engineering, IIT Mandi
- Dr. Viswanath Balakrishnan, Chair, School of Engineering, IIT Mandi
- Dr. Rajeev Kumar, Associate Professor, School of Engineering, IIT Mandi
- Dr. Vishal Singh Chauhan, Associate Professor, School of Engineering, IIT Mandi

Speaking during the conference, Prof. Timothy A. Gonsalves, Director, IIT Mandi, said, "Artificial Intelligence (AI) is taking over the world. Almost everything is automated these days and we should know how to utilise this technology to remain valuable in the market. IIT Mandi became the first IIT to introduce a full-fledged B. Tech. course in Data Science to address the need of the hour."

Over the last decade, composite materials have found large scale applications in aerospace industries. With the advent of cheap sensor technologies and powerful computational facilities, condition monitoring has come up as another avenue to ensure safety and serviceability of composite materials used in the aircrafts. The one week workshop was designed to introduce theoretical and practical aspects of composite material research to engineers and researchers to make them equipped to solve problems. The workshop was particularly beneficial for engineering students, engineers and scientists working in various institutions.

The primary objective of this workshop included:

- Introduction to Composite Materials: Basics and Fundamentals
- Manufacturing techniques for Polymer Matrix Composites, Metal Matrix Composites and Ceramic Matrix Composites
- Mechanics of Composite Materials
- Introduction to Finite Element Method for the design analysis of Composite materials
- Micro-macro mechanics-based analysis using ANSYS and DIGIMAT software
- Condition monitoring of composites and application of machine learning
- Hands-on experience with composite condition monitoring
- Exposure to cutting edge research on composites in aerospace industries (will be presented by Scientists from Aeronautics Research & Development Board, DRDO)

Speaking about the impact of the workshop, Dr. Subhamoy Sen, Workshop Coordinator and Assistant Professor, School of Engineering, IIT Mandi, said, "With cutting edge technologies for design and manufacturing and cheap sensor technologies, India is advancing towards the digital age. To materialise the aspiration of making India a global manufacturing hub, the in-house development of state-of-the-art design and manufacturing concepts for all spheres of the industry is being encouraged. The civil, defense and commercial aerospace industries are also pushing their limits to compete with the world leaders in this domain. Over the last decades, composite material has found large scale applications in aerospace industries. With the advent of cheap sensor technologies and powerful computational facilities, condition monitoring has come up as another avenue to ensure safety and serviceability of composite materials in use in the aircraft. This workshop is therefore in line with the nationwide initiative for "make in India" and "Digital India" by Govt. of India."

Jointly sponsored by Solize and Mathworks, the workshop was attended by more than 100 participants including students and faculty members from Engineering Institutes, Colleges, Polytechnics and Practicing Engineers and Researchers from Industries and R&D Institutions. The workshop provided a thorough idea of Micro-Macro mechanics-based analysis of composite using ANSYS and DIGIMAT software; hands-on experience of Condition Monitoring of composites and Manufacturing techniques for a wide range of composite materials.

https://indiaeducationdiary.in/iit-mandi-hosted-a-national-workshop-on-advanced-composites-for-aerospace-design-manufacturing-and-condition-monitoring-perspective/

Explained: Eyes on the Sun, how ISRO is preparing for its next giant leap in space

The ISRO is preparing to send its first scientific expedition to study the Sun. Named Aditya-L1, the mission, expected to be launched early next year, will observe the Sun from a close distance

By Anjali Marar

Pune: Earlier this month, 47 new papers were published in a special supplement of The Astrophysical Journal, analysing data from the first three flybys of the Parker Solar Probe, NASA's historic mission to the Sun. The probe, launched on August 12, 2018, completed its fourth close approach — called perihelion — on January 29, whizzing past at about 3.93 lakh km/h, at a distance of only 18.6 million km from the Sun's surface.

So why is all of this exciting for India?

Alongside another mission to the Moon, being planned for next year, and the first human space flight scheduled for 2022, the Indian Space Research Organisation (ISRO) is also preparing to send its first scientific expedition to study the Sun. Named Aditya-L1, the mission, expected to be launched early next year, will observe the Sun from a close distance, and try to obtain information about its atmosphere and magnetic field.

ISRO categorises Aditya L1 as a 400 kg-class satellite, that will be launched using the Polar Satellite Launch Vehicle (PSLV) in XL configuration. The space-based observatory will have seven payloads (instruments) on board to study the Sun's corona, solar emissions, solar winds and flares, and Coronal Mass Ejections (CMEs), and will carry out round-the-clock imaging of the Sun.

The mission will be undertaken in collaboration between various labs of ISRO, along with institutions like the Indian Institute of Astrophysics (IIA), Bengaluru, Inter University Centre for Astronomy and Astrophysics (IUCAA), Pune, and Indian Institute of Science, Education and Research (IISER), Kolkata. Aditya L1 will be ISRO's second space-based astronomy mission after AstroSat, which was launched in September 2015.

What makes a solar mission challenging is the distance of the Sun from Earth (about 149 million km on average, compared to the only 3.84 lakh km to the Moon) and, more importantly, the super hot temperatures and radiations in the solar atmosphere.

All participating institutions are currently in the final stages of developing their respective payloads. Some payloads have been built, and are in the testing phase with each component being checked and calibrated. Some payloads are at the stage of integration of individual components.

But why is studying the Sun important?

Every planet, including Earth and the exoplanets beyond the Solar System, evolves — and this evolution is governed by its parent star. The solar weather and environment, which is determined by the processes taking place inside and around the sun, affects the weather of the entire system. Variations in this weather can change the orbits of satellites or shorten their lives, interfere with or damage onboard electronics, and cause power blackouts and other disturbances on Earth. Knowledge of solar events is key to understanding space weather.

To learn about and track Earth-directed storms, and to predict their impact, continuous solar observations are needed. Every storm that emerges from the Sun and heads towards Earth passes through L1, and a satellite placed in the halo orbit around L1 of the Sun-Earth system has the major advantage of continuously viewing the Sun without any occultation/eclipses, ISRO says on its website.

L1 refers to Lagrangian/Lagrange Point 1, one of five points in the orbital plane of the Earth-Sun system. Lagrange Points, named after Italian-French mathematician Josephy-Louis Lagrange, are positions in space where the gravitational forces of a two-body system (like the Sun and the Earth) produce enhanced regions of attraction and repulsion. These can be used by spacecraft to reduce fuel consumption needed to remain in position. The L1 point is home to the Solar and Heliospheric Observatory Satellite (SOHO), an international collaboration project of NASA and the European Space Agency (ESA).

The L1 point is about 1.5 million km from Earth, or about one-hundredth of the way to the Sun. Aditya L1 will perform continuous observations looking directly at the Sun. NASA's Parker Solar Probe has already gone far closer — but it will be looking away from the Sun. The earlier Helios 2 solar probe, a joint venture between NASA and space agency of erstwhile West Germany, went within 43 million km of the Sun's surface in 1976.

What kind of heat will Aditya L1 face?

The Parker Solar Probe's January 29 flyby was the closest the spacecraft has gone to the Sun in its planned seven-year journey so far. Computer modelling estimates show that the temperature on the Sun-facing side of the probe's heat shield, the Thermal Protection System, reached 612 degrees Celsius, even as the spacecraft and instruments behind the shield remained at about 30°C, NASA said. During the spacecraft's three closest perihelia in 2024-25, the TPS will see temperatures around 1370°C.

Aditya L1 will stay much farther away, and the heat is not expected to be a major concern for the instruments on board. But there are other challenges.

Many of the instruments and their components for this mission are being manufactured for the first time in the country, presenting as much of a challenge as an opportunity for India's scientific, engineering, and space communities. One such component is the highly polished mirrors which would be mounted on the space-based telescope.

Due to the risks involved, payloads in earlier ISRO missions have largely remained stationary in space; however, Aditya L1 will have some moving components, scientists said. For example, the spacecraft's design allows for multiple operations of the front window of the telescope — which means the window can be opened or shut as required.

https://indianexpress.com/article/explained/parker-solar-probe-eyes-on-the-sun-how-isro-is-preparing-for-its-next-giant-leap-in-space-6275034/

Use AI to fight pandemics

The Coronavirus outbreak has called into question the ability of governments in predicting, containing and even preventing epidemics. AI and big data can be the answer

By Abhinav Verma & Yukti Sharma

In 2019, the Global Preparedness Monitoring Board said that the world was not prepared for the next big pandemic, which could potentially spread between continents in 36 hours and kill up to 80 million people. It pointed out that the climate crisis, global migration and humanitarian conflicts were all breeding grounds for newer outbreaks. The Coronavirus took us by surprise, simultaneously pointing out that systems of the past decade might not be effective in tackling challenges that are taking novel shapes and forms. With one of the largest populations and widening socio-economic divides, India is vulnerable to contagions. Experts claim that this susceptibility hasn't changed much in the last 100 years, when India was one of the countries worst hit by the Spanish Influenza in 1918. We have been struggling to contain influenza and encephalitis outbreaks for the last four decades. There is a pressing need to overhaul how we respond to outbreaks, both globally and in India, keeping technology at the centre. Coronavirus' example itself shows that it was two Artificial Intelligence (AI)-enabled enterprises, BlueDot and Metabiota, that provided the key and life-saving insights into the containment of this viral eruption. By using Natural Language Processing (NLP), BlueDot sifts through and analyses over 10,000 articles in 65 languages, including foreign news reports, plants and animal disease networks and official proclamations, to issue warnings. It was able to catch and warn about the impending outbreak days before the official announcement was made. Similarly, Metabiota applied AI to the used travel itineraries and flight patterns to determine the likely spread of the disease. It was accurate insofar as it predicted that South Korea, Japan, Taiwan and Thailand had the highest risk of the viral outbreak.

AI for comprehensive disease surveillance:

As epidemics spread in phases from introduction to amplification and finally contained transmission, the response and sequence of interventions flow accordingly. Even before diseases erupt, a public health system attempts to anticipate new and re-emerging disease through early detection. Thereafter, the response strategy changes to containment, control and mitigation, followed by re-focus on eradication. Creating a technology-based intervention into pandemic management also needs to consider the response strategies commensurate with the stage of epidemical evolution.

However, technologies have a critical and more successful role to play in some phases of the response cycle as opposed to others. One such is prediction and early warnings, for which integrated disease surveillance programmes exist both in the public and private sectors. These surveillance strategies include Event-Based Surveillance (EBS) and Risk Modelling. EBS systems use unstructured data from multiple sources like internet, official reports, social media and so on, to detect and trace the evidence of an emerging threat and overlay it with traditional surveillance systems to issue public health warnings and formulate mitigation strategies. The Global Public Health Intelligence Network (GPHIN), and HealthMap, an automated electronic information system, are EBS tools that use NLP, text processing algorithms and Machine Learning (ML). These can increase the speed of identifying signs, filtering information, enhance capacity for consuming information and increase accuracy manifold.

The Program for Monitoring Emerging Diseases (ProMED), Medical Information System (MedISys) and Pattern-based Understanding and Learning System (PULS) are similar EBS tools. These systems are proving absolutely essential in disseminating information at breakneck speed, characterising transmissibility patterns, contagiousness, illnesses and deaths caused by the pathogen, aiding quicker emergency response. Risk modelling uses statistical tools to characterise and identify factors in populations or individuals that enhance their vulnerabilities to contracting a particular disease. Overlaying this data with open source internet data and climate data accounting for presence, distribution and movement of pathogens can help identify correlations that were invisible to us before. For example, in China, the cases of hand, foot and mouth disease in children were best predicted by AI models that utilised data on weekly temperature and precipitation as well as data on disease-related queries from the Chinese Baidu search engine.

Compared to these, India's Integrated Disease Surveillance Programme (IDSP) uses manual surveillance, where data on some 24 epidemic-prone diseases is collected on a weekly basis at the primary health centre level and reported upwards. Whenever there is a rising trend of illnesses in any area, it is investigated by the Rapid Response Teams (RRT) to diagnose and control the outbreak. This system is slow and doesn't use any risk modelling for predictions. A study by the Indian Institute of Public Health, Hyderabad in 2016 pointed out that this procedure suffered a time lag from anything between three to 64 days.

The Media Scanning and Verification Cell of the IDSP was established in 2008 for early warning signals through media reports. However, this activity is limited to manually scanning newspapers/electronic media. Some technologically-adept States use Google alerts to automate the process. Needless to say, State media verification cells are unable to exhaustively scan all media sources with the swiftness that's needed to respond to outbreaks. The Health Ministry is piloting an Integrated Health Information Platform (IHIP) that can enable near real-time data reporting and hopes to apply modelling and GIS tools to enhance the IDSP. There exists immense scope for integrating emerging technologies within the IHIP platform. But at present these discussions are nascent.

Focussing on holistic pandemic management:

While most technology applications in pandemic response are limited to surveillance, there is a dire need to identify intervention areas in overall pandemic management. AI can not only help us predict where the disease might be travelling to, but it can also offer insights into how people take up health

services during emergencies. Accounting for health-seeking behaviours in designing response strategies can substantially boost effectiveness and success of responses.

Learning from behavioural data, ML models can identify less obvious patterns in human behaviour and disease transmission, which could enable a targeted response. This is called infodemiology, where you can integrate internet data into public health informatics to examine individual health-seeking patterns during emergencies. Google Trends Data as well as more-specific Google Dengue Trends have also been used by researchers to develop a holistic understanding of behavioural aspects of citizen response to pandemics. Such insights can be used to determine where health services are imperative to be delivered in times of shortages that mandate trade-offs. In a more mature system, one would also be able to determine if an individual or a group of people is likely to change its location, go out and seek formal assistance, or if they will adhere to treatment routines — all insights that can help authorities make better decisions.

AI-assisted genomics research is slowly emerging to be a game changer in the rapid development of treatments and vaccines for contemporary infections. Baidu has developed an algorithm that can significantly speed up RNA structure prediction and subsequently unlock the key to the virus. Developing models that can match patterns embedded in the viral genomes to their animal host and vectors that carry the virus can be a breakthrough in narrowing the search for diseases. This can lead to early interventions in controlling disease upsurge or preventing their emergence altogether.

Building blocks for AI in pandemic response:

Building a comprehensive and accurate surveillance system requires massive amounts of quality data from different sources. Meteorological data, for instance, needs to be overlaid with vector-movements and population mobility data to accurately identify hotspots for outbreaks. This requires Government departments coming together in mission-mode and pooling their data into one consolidated programme. It also requires AI-enabled technologies to be integrated into existing workflows for pandemic management and creation of new protocols with adequate capacity-building, so its benefits can flow to all levels.

As pandemics are not constrained by national boundaries, a global surveillance system is imperative, something where multilaterals like the WHO and international foundations can play a catalytic role. Nations need to be propelled to make disease information public and if possible move towards interoperable surveillance networks that can communicate with their global counterparts.

Can AI fight the next Coronavirus is a question up for debate. But it can bolster our capacity to respond substantially, especially in disease pre-emption, design of accurate interventions and in some cases with more research investment, even prevention of outbreaks.

Therefore, in a fight against outbreaks — one that the global community is not winning — channelising the power of data through AI can be the perfect weapon. Coronavirus and the swiftness that AI-enabled solutions showed here were necessary proof of the concept to incentivise greater resources and collaborations in AI-assisted outbreak management. Now it is upon governments and multilaterals to lead the way in mobilising AI against the next virus.

(Verma is a lawyer and public policy consultant and Sharma is a software engineer. Both work with the International Innovation Corps, University of Chicago.)

https://www.dailypioneer.com/2020/columnists/use-ai-to-fight-pandemics.html

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SETI begins search for 'technosignatures' in the hunt for alien life

Experts are developing state-of-the-art techniques to detect signatures that point to extraterrestrial existence

Scientists are ramping up their efforts in the search for signs of alien life.

Experts at the SETI Institute, an organisation dedicated to tracking extraterrestrial intelligence, are developing state-of-the-art techniques to detect signatures from space that indicate the possibility of extraterrestrial existence.

These so-called "technosignatures" can range from the chemical composition of a planet's atmosphere, to laser emissions, to structures orbiting other stars, among others, they said.

Dr Tony Beasley, director of the National Radio Astronomy Observatory (NRAO) telescope based in Virginia, US, said: "Determining whether we are alone in the universe as technologically capable life is among the most compelling questions in science."

SETI scientists plan to develop a system that will "piggyback" on the Very Large Array (VLA) telescope based in Mexico and provide data to their technosignature search system.

Dr Beasley added: "As the VLA conducts its usual scientific observations, this new system will allow for an additional and important use for the data we're already collecting."

Alien life form whether intelligent or not, can produce detectable indicators such as large amounts of oxygen, smaller amounts of methane, and a variety of other chemicals, the experts said.

So in addition, scientists are also developing computer models to simulate extraterrestrial environments that can help support future searches for habitable planets and life beyond the solar system.

Victoria Meadows, principal investigator for NASA's Virtual Planetary Laboratory at the University of Washington, which studies to detect exoplanetary habitability, said: "Upcoming telescopes in space and on the ground will have the capability to observe the atmospheres of Earth-sized planets orbiting nearby cool stars, so it's important to understand how best to recognise signs of habitability and life on these planets.

"These computer models will help us determine whether an observed planet is more or less likely to support life."

Meanwhile, SETI's Breakthrough Listen Initiative, which launched in 2015 to "listen" for signals of alien life, has released nearly two petabytes of data from the most comprehensive survey yet of radio emissions from the plane of the Milky Way galaxy and the region around its central black hole.

The organisation is now inviting the public to search the data, gathered from various telescopes around the world, and look for signals from intelligent civilisations.

Yuri Milner, an entrepreneur and founder of the Breakthrough initiative, said: "For the whole of human history, we had a limited amount of data to search for life beyond Earth.

"So, all we could do was speculate.

"Now, as we are getting a lot of data, we can do real science and, with making this data available to general public, so can anyone who wants to know the answer to this deep question."

The initiatives and strategies in expanding the search for extraterrestrial life were presented at the annual meeting of the American Association for the Advancement of Science (AAAS) in Seattle.

https://www.sciencefocus.com/news/seti-begins-search-for-technosignatures-in-the-hunt-for-alien-life/

Numbers matter

Data science and machine learning offer several opportunities.
Kunal Jain shares tips that can help to make it a lucrative option
By Kunal Jain

Technology is changing at a pace that multiple industries are ripe for disruption. What was relevant and sought after a few years ago, is no longer in vogue. Ask a Digital Marketeer, a banker or for that matter a professional in any industry — would they be relevant if they did not learn new things for the last five years?

In a lot of scenarios — having experience is actually going against you. Try saying that you have seven years of experience in NET/Java/software testing and see what opportunities do you get. Now say that you are in your final year of graduation, have a good understanding of machine learning and have been winning data science competitions for a year — you will see floodgates of opportunities open.

The point is that the field for creating impact after graduation has never been this flat before.

Also there has been a slew of new technologies which have become mainstream in the last five years. blockchain, data science, Internet of Devices (IoT), augmented reality (AR) and virtual reality (VR), reusable space vehicles, new programming languages, new programming frameworks — all of these have come up in the last five years.

So one can't ask for experience beyond a few years, if one want to hire a lot of people and make fast progress. Among all of these, data science and machine learning probably hold the most number of opportunities as things see today. Data science is now a horizontal impacting multiple industries — banking, telecom, ecommerce and oil & gas. So, it is no surprise that most of the graduates coming out today look up to building careers in data science.

Having said that, a lot of them do not make a meaningful effort in learning and applying the subject. Hence, it is still a very small percentage of people coming out today — who get opportunities in data science. But, with the right preparation and application — there is no limit to the kind of opportunity you can get and the kind of impact you can create.

So, how does one prepare for a data science career as a person graduating soon? Here are some handy tips.

- Start learning about data science and programming as soon as you can. It does not matter which stream you are in. As long as you have good quant skills, love problem solving and have a lot of curiosity — you are a good fit with data science roles. Start by learning python, basics of statistics and linear algebra. Once you have done that — you can move ahead with learning data science algorithms and processes.
- Apply what you learn. Data science is actually an Applied Science and what better way to stake your claim than showing some applications. You not only learn how to solve problems using these tools and techniques, but also differentiate your resume from all those wanting to do data science but not putting in efforts in the direction. Participate in practice problems on Analytics Vidhya or

Kaggle to start with. Once you are comfortable, participate in a few hackathons and data science competitions. You can also pick up open data sets in the area of your interest to create projects and solve problems.

- Participate in data science communities and look for mentors. There are some thriving data science communities today in India. Join these communities, interact with data science professionals through meetups, webinars, slack channels and find a few mentors to guide you for the rest of your career.

As long as you have a few years to learn, you can start devoting a few hours daily and build up the momentum over time. If that is not the case and you have placements coming up in the next 3 - 6 months, you will need to put in more effort to cover up for the expectations. There is no dearth of resources available — only time! So make sure you devote high quality time and you can cover the ground.

Remember — you can't really ask for a better time to graduate!

(The writer is CEO & Founder of Analytics Vidhya)

https://www.dailypioneer.com/2020/avenues/numbers-matter.html