शोधसिन्धु @CSIR-CSIO

A Periodic Newsletter of CSIO, Chandigarh

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Vol. 1 Issue 2

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INSIDE THIS ISSUE

2020 HAPPY NEW YEAR

"You can't always choose who comes into your life, but you can learn what lesson they teach you."

– Sir C V Raman

From the Director....

It gives me immense pleasure to present the second issue of '*शोधसिन्धु*', the periodic newsletter of CSIR-CSIO. Globally, mankind is going through a crucial phase of its evolution where the economic and industrial needs of development are challenged by limited natural resources and harmful environmental impacts on our ecological system. This has shifted the focus of the scientific community towards developing affordable technologies in a low-resource setting and providing technological solutions for clean water, healthy air and low-emission energy sources. For a developing country and growing economy like ours, it is also important to strengthen our industrial and scientific workforce through targeted skill development programs and empower our youth with globally competitive human resource development schemes. Apart from these, as a means of self-defence and deterrence in hostile situations, it is the responsibility of the scientific community of our nation to indigenously develop key strategic technologies for our armed forces. On this occasion, I am happy to share that CSIR-CSIO has been contributing to all such National development goals through transdisciplinary research covering diverse areas of sensors, advanced optics and photonics instrumentation, biomedical, computational and agri-instrumentation as well as various skill development programs.

I am confident that readers will find this issue of the newsletter interesting and will help us in building our nation through constructive suggestions, feedback and encouragement.

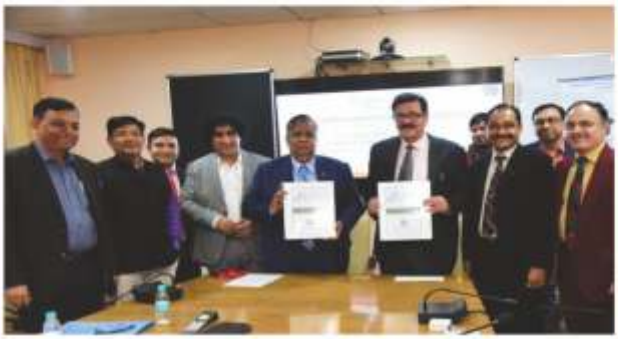
(Prof. R K Sinha)

Key Innovation Indicators: 2018-19

Since its inception, CSIR-CSIO has always endeavoured to offer innovative low-cost technological solutions for the betterment of Indian industries as well as inclusive growth of the society. The laboratory derives its strength from a highly skilled workforce with expertise in varied fields of instrumentation including advanced sensors, optics & photonics, computational & medical instrumentation as well as nanotechnology. The lab has also carved a niche in the areas of strategic instrumentation by developing state-of-the-art avionics systems for Indian air force, Indian navy and defence PSUs. During the year 2019, the laboratory continued its successful journey by developing optical lighting solutions for Indian navy ships, advanced sensors for water quality monitoring, energy management systems as well as next generation instrumentation for precision farming. As collaboration has become the key for faster technology development and deeper market penetration, the laboratory established a strong association with various academic and industrial units for sharing of resources and ideas. Other major activities during this year include participation in various theme-based mission mode projects, hosting of mega scientific events like 'Smart India Hackathon – Grand Finale', targeted skill development initiatives for national and international participants and scientific outreach activities under 'CSIR Jigyasa' programme.

The R&D activates resulted in high quality publication of 103 papers in SCI journals as well as filing of 08 patents of which 03 were filed in India and 05 were in abroad. Five technologies have been successfully transferred to industry. The technology for 'NVG Compatible LED Lights for Helo Deck Visual Landing Aid System was transferred to the industry with an aim to indigenize optical landing systems targeted for landing and movement of helicopters on Indian Navy ships. Development of this technology demonstrates the laboratory's expertise and knowledgebase in designing complex opto-mechanical systems as per maritime and military standards for direct deployment in operational environment. On the post-harvest technology front, the technology of 'Rice Grain Analysis Software' was commercialized which uses advanced image processing algorithm for quality analysis of rice grains with respect to its shape and dimensions.

NVG Compatible LED Lights For Helo Deck Visual Landing Aid System for Indian Navy Ships



CSIO Transfers Technical Know-how of Helo Deck Visual Landing Aid System to M/s Elcome Integrated Systems Pvt. Ltd, Mumbai

The laboratory through its regional centre in Chennai developed and commercialized two technologies such as 'Pump Efficiency Monitoring System' and 'Energy Meter with Digital Communication' during this year.

Prototype of Pump Efficiency Monitoring System developed by CSIR-CSIO Chennai Centre

These technologies offer affordable solutions for industries, pump houses, commercial and residential complexes in ensuring energy efficiency through smart monitoring of real-time energy loss, consumption and power flow information.

During this year, a novel 'Sensor System for Fluoride, Nitrate & Arsenic' was transferred to the industry for detecting such pollutants in potable water sources. Such systems find immense application in pharmaceutical industries, water quality testing laboratories and pollution control boards for automated monitoring of quality of potable water.

Flagship Initiatives

Taking forward its commitment to develop state-of-the-art strategic technologies for Indian armed forces, the laboratory has taken up challenging R&D activities for development optical landing systems for helicopter and aircraft carrier ships, optical gunsight for Dornier aircrafts, Drogue lighting systems for air-to-air refueling as well as next generation see-through displays for a host of aircraft variants.

Optical Gun Sight for Surveillance Aircraft

Successful development and subsequent commercialization and induction of Head-up-Display (HUD) technology into Indian Airforce has already established the laboratory's credibility in developing and delivering key avionics technologies. The latest initiatives in this direction would further add newer dimensions to the lab's expertise in handling such critical user-driven technological interventions. The lab is also developing multimodal sensor networks for border security and safety of critical installations and has already established linkages with various defence organizations for technology deployment. The earthquake early warning system developed by the laboratory for Delhi Metro is also being customized for requirements of other such railway authorities.

Mission Initiatives

In line with CSIR's mission to leverage its excellent world class R&D infrastructure to deliver on projects with societal aims and challenges, CSIR-CSIO has also been contributing significantly to various mission mode initiatives. The laboratory is actively pursuing development of 'Electrochemical platform for cardiac biomarkers' under the Nano-Biosensor Mission, 'Sensors for water quality analysis' under Water Mission, 'Pesticide detection, electrostatic coating, optical nose' under Food safety Mission, 'Border security management systems' under Safety and security of vital installations Mission and 'Seismic signal analytics, deep learning for lung diseases' under Intelligent systems Mission. The lab has networked with other CSIR laboratories, end-users as well as technology partners for time-bound delivery and faster translation of knowledgebase into products.

Human Resource Development

CSIR-CSIO has been contributing for human resource development in advanced areas of instrumentation through its AcSIR and Indo-Swiss Training Centre. Currently, 155 Ph.D scholars are enrolled with AcSIR in the laboratory under the guidance of CSIO scientists who also serve as AcSIR faculty. Broad areas of research offered at AcSIR-CSIO Chandigarh campus include avionics, optics & photonics, nano-technology & nano-photonics, advanced materials & sensors, optical devices & systems, multi-sensors & computational instrumentation, seismic sensors & systems, bio-medical engineering & instrumentation, agrionics, precision mechanical systems, etc. Institution has contributed towards quality human resource development in different areas of engineering and science with 16 individuals graduated with Ph.D degrees from AcSIR.

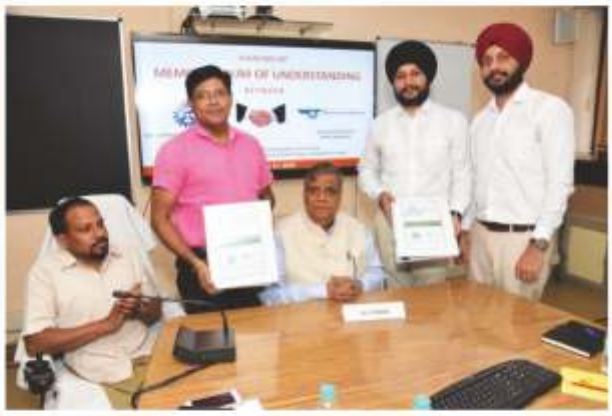
Indo-Swiss Training Centre (ISTC), a constituent unit of CSIR-Central Scientific Instruments Organisation awards Engineering Diploma and Advanced Diploma to the students. During these courses, emphasis is laid on imparting practical training to enhance skills of trainees.

Students being trained at CSIO-ISTC

The course contents of ISTC programs cater to the demand of all major industries dealing in Mechatronics, Electrical, Design & Manufacturing, Die & Mould, Electronics and Mechanical Engineering. Presently, ISTC pass-outs are working in senior positions in India & Abroad.

Collaboration

The institute has always accorded high priority to establish strong R&D-Academia-Industry linkages by entering into various MoUs with leading institutes & industrial partners with a view to share expertise and to foster networking of resources.



CSIR-CSIO & Dashmesh Industries sign MoU to further improve the Electrostatic Sprayer by incorporating usage meter and GPS capability in it

During 2018-19, 04 Memoranda of Understanding were signed by CSIR-CSIO with Elcome Integrated Systems Pvt. Ltd., Mumbai; Department of Immunology, Florida International University (DoI-FIU), Miami, Florida, USA; Tektronix Pvt. Ltd., Bangalore and; Steel Strip Limited, Chandigarh.

CSIR-CSIO and HAL-Korwa joined hands by entering into an MoU to share expertise and lab facilities for indigenization of various optical and optronic systems for different aircraft platforms

Such collaborations would facilitate joint development of technologies in the areas of common interest and would also help in their deployment.

Technology in Focus

Low Cost Air Conditioner Efficiency Meter: Designed & Developed by CSIR-CSIO

A reliable, economically competitive and environmentally sustainable electricity system is the cornerstone of a modern Indian society. The Fourth Industrial Revolution builds on the digital revolution and combines multiple technologies that are leading to unprecedented paradigm shifts in the economy, society and for individuals.

Low-cost air conditioner efficiency metre

CSIR CSIO Delhi Centre's "Low Cost Air Conditioner Efficiency Meter" (ACE meter) is one such technology which will revolutionize the Indian smart grid industry. The developer of this technology Shri D. Bansal, Scientist In-charge & Project leader, CSIO Delhi Centre informed that the developed product shall be useful to evaluate the working performance of AC units and will be a test tool for window air conditioners.

Indigenous technological solution for smog control

This technology uses electrostatic field to generate charged spray droplets which recombine with naturally occurring oppositely charged dust and smog particles and settle down onto the ground very efficiently and effectively.

CSIR-CSIO has been working in advanced electrostatic spraying technologies for more than 7 years particularly on technologies for societal, farmer's welfare, and industrial benefits and came up with an air-assisted efficient pesticide electrostatic spraying technology. This is different from the conventional spraying technologies as it can control the excessive use of pesticides by reducing the droplet size and ensuring even distribution of spray. Transferred to M/s Dashmesh Industries, Alwar, Rajasthan, the product is available in the market for the end user by a brand name eSPRAY and being used in India as well as overseas.

The multidisciplinary facet of electrostatic spraying technology has now become a major tool to seek more proactive approaches to remove barriers and bring solutions for a varied range of societal, environmental & industrial problems, and add benefits to nutrition, food safety and farmer's welfare

Pictures Speak

National Technology Day Function
28/02/2019

CSIR-CSIO Foundation Day
30/10/2018

Inspire Awards – MANAK mentorship Workshop
29/11/2018

Dr Amit Laddi receiving National Award 2018 for development of Mobility Assistive Device 04/12/2018

Pictures Speak

Prof R K Sinha presenting a memento to Dr. Shekhar C. Mande, DG CSIR & Secretary DSIR, GoI 28/12/2018

Dr. Shekhar C. Mande, DG CSIR & Secretary DSIR, GoI inaugurated the new Optical Thin Films Lab 28/12/2018

Training Program for Services on Operation, Maintenance and Calibration of Bio-Medical Equipment 29/04/2019

Lecture Series on "Fundamental of Optical Imaging and Aberrations" by Prof. Virendra Mahajan 19/12/2018

MDP on Operation and Maintenance of Analytical Equipment for international participants 24/01/2019

Independence Day Celebration
15/08/2019

50th meeting of Research Council of CSIR-CSIO
05/03/2019

Invited talk by Dr. D. K. Aswal, Director, CSIR-NPL, Delhi
22/04/2019

CSIR-CSIO in Media

Seminar on quality infrastructure of India

CHANDIGARH : A seminar on 'understanding the quality infrastructure of India' was organised at Central Scientific Instruments Organisation (CSIO), here on Monday. DK Aswal, director, CSIR-NPL, New Delhi, said, to achieve high economy and high quality of life, quality infrastructure is needed to bind government, industry, universities, science and technology, and civil society and media. He said improved product quality and compatibility, decreased environmental impact, enhanced safety and health and increased international trade is not possible without quality infrastructure. CSIO

CSIO shares tech with Delhi firm

TIMES NEWS NETWORK

Chandigarh: The Central Scientific Instruments Organisation (CSIO), which developed a system to correct postural imbalance in patients, transferred its technology to a Delhi-based company on Friday.

CORRECTING BODY POSTURE

Postural stability assessment is an important task that has found widespread medical and therapeutic applications. Typically, the developed system is used to measure the distribution of the weight of body about its centre of pressure, which governs the stability or postural balance. The system developed by CSIO provides bio-feedback along with audio and vibrational feedback to the user for correcting the postural stability.

CSIO director R K Sinha said the postural stability assessment system was developed under the fast-track translational programme, which emphasises on transfer of research output for the benefit of common people of the society. The technology has been transferred to M/s Bio-Medi International Pvt Ltd, New Delhi.

The transfer was signed by Dr Surender Saini of CSIO and the Delhi-based firm's managing director Nityanand Panchal, who will now start manufacturing the rehabilitation devices with this technology. "The device will also help those requiring rehabilitation in the armed forces and will be exported to foreign countries," said Sinha.

CSIR-CSIO transfers Rice Grain Analysis software

CHANDIGARH: Council of Scientific and Industrial Research-Central Scientific Instruments Organisation (CSIR-CSIO), Chandigarh, transferred the technology of Rice Grain Analysis software, Version 1.0 to M/s Ambala Associates, Ambala, on Friday. The technology was developed by Amitava Das and his team at computational instrumentation division of CSIR-CSIO, Chandigarh. The software provides a fast, inexpensive, efficient, repeatable and robust method for dimensional analysis of rice grains, which is an important step in quality assessment of rice for marketing and trading, both in

CSIO develops targeting, navigation system for Navy

TRIBUNE NEWS SERVICE

CHANDIGARH, SEPTEMBER 17

A mission critical navigation and targeting system for the Navy's warships and submarines has been developed by the Central Scientific Instruments Organisation (CSIO) here that would now be manufactured commercially.

Christened Marine Bearing Sight (MBS), it provides instantaneous azimuth of identified targets, whether on shore or in sea, other vessels and even astronomical bodies. Azimuth is the horizontal direction expressed as the angular distance between the direction of a fixed point and the direction of the object.

The MBS is used in conjunction with the Marine

Marine Bearing Sight gives instantaneous direction of identified target

Compass Repeater System onboard naval ships to provide an accurate means to indicate the true north and corresponding directions of ships, according to a statement issued by the CSIO here today.

It is provided with in-built illumination for night operations. The device provides unique features of multiple focal lengths and all lighting conditions. The technology is an offshoot of the ongoing activities in the related fields and outcome of the recent memorandum of understanding between Council for Scientific and Industrial Research (CSIR) and the Navy.

The technology was unveiled by Dr Shekhar C Mande, Director General (CSIR), in New Delhi today. He lauded the efforts of Dr Vinod Karar and his team for commercialising the product in a very short span to meet strategic needs.

CSIO Director Prof RK Sinha emphasised that it had become essential to have a sustainable industry-academia-laboratory-end user ecosystem for sharing resources, faster translation of technologies into products and critical evaluation of the developed product to develop next generation variants.

दैनिक भास्कर

02-Jan-2019
जागरण भास्कर Page 3

एम्सीयू में इंडियन साइंस कांग्रेस का समापन, 30 हजार पार्टिसिपेंट्स को नवीनतम वैज्ञानिक गतिविधियों के बारे में

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Chandigarh Tribune

'Find novel solutions in artificial intelligence'

CHANDIGARH, MAY 22

A workshop on the theoretical and practical aspects of machine intelligence and deep learning, christened "Machine intelligence and deep learning: An interdisciplinary perspective," being conducted by the Central Scientific Instruments Organisation (CSIO), concluded here today.

As many as 35 participants, including students, researchers, and faculty working in interdisciplinary areas participated in this workshop, which also included hands-on training sessions.

The programme was inaugurated by Prof Shyam Sundar Pattanaik, Director, National Institute for Technical Teachers Training and Research, Chandigarh. He

tions and start-up applications on one platform.

He also encouraged the young participants at the workshop to think out of the box and find novel solutions in the field of artificial intelligence.

Prof RK Sinha, Director, CSIO, said artificial intelligence had percolated fast due to enabling technologies such as high-speed optical fiber connectivity and fast processors. He encouraged the participants to apply this technology for the good of society.

During the workshop, a "challenge on demonstration of AI-based solutions" was also organised on showcasing artificial intelligence driven application in major sectors such as agriculture, health-

जागरण सिटी चंडीगढ़/मोहाली

अभी सवर

अब इंजेक्शन के लिए बुजुर्गों और बच्चों की नसों को ढूंढ़ना नहीं पड़ेगा

जागरण विशेष

THE TIMES OF INDIA

CHANDIGARH TIMES

'Can understand, not predict earthquakes'

Chandigarh: Inaugural session of "National Conference on Earthquake Investigation & Instrumentation" (NCEII, 2019) was held at Central Scientific Instruments Organisation (CSIO) on Monday.

Kalachand Sain, director, Wadia Institute of Himalayan Geology, Dehradun, was the chief guest. In his inaugural address, he said, "Though we are able to understand earthquakes scientifically, we are unable to predict them due to complexity of earth. He said the conference will serve to bridge the gaps of our understanding to provide

realizable solution."

Dr N Gopalakrishnan, director Central Building Research Institute, who was the guest of honour showed interest in the seismological observatory established in CSIO.

Prof R K Sinha, director, CSIO, in his inaugural address said that earthquake monitoring has been one of the thrust areas of CSIO. Besides routine seismic monitoring in its well established seismic observatories, CSIO is now diversifying into new niche in this technology for strategic and tactical applications.

CSIR-CSIO in Media

Three-day Indo-French workshop starts

CHANDIGARH: Central Scientific Instruments Organisation is conducting a three-day Indo-French workshop on 'Robotics for Rehabilitation' (Robo-Rehab 2019) in coordination with LIRMM and LISSI, France. The workshop aims to create a network of researchers sharing ideas in the area of robotic devices to assist the individuals suffering from strokes and spinal cord injuries. Director of National Institute of Technical Teachers Training and Research (NITTTR) Shyam Sundar Pattnaik inaugurated the workshop.

Talk on solar cell technology

CHANDIGARH, APRIL 12

As a part of diamond jubilee celebrations of Central Scientific Instruments Organisation (CSIO), a talk on 'Understanding 2D-3D interfaces for solar cell and thermo-electric applications' was delivered by Prof BR Mehta from the Department of Physics, Indian Institute of Technology, New Delhi, here today.

CSIO begins series of seminar

Chandigarh: As a part of the diamond jubilee celebration year of the Central Scientific Instruments Organization (CSIO), a series of seminar, comprising talk on emerging research topics, are being organized on the CSIO campus.

Dr D K Aswal, director, CSIR-NPL, Delhi, delivered a talk on the topic "Understanding the quality infrastructure of India".

Quakes difficult to predict, says

TRIBUNE NEWS SERVICE

CHANDIGARH, SEPTEMBER 23

A two-day national conference on 'Earthquake: Investigation and Instrumentation' began at the Central Scientific Instruments Organisation (CSIO) here today.

The conference is a part of the institute's diamond jubilee celebrations. Dr Kalachand Sain, Director, Wadia Institute of Himalayan Geology, Dehradun, was the chief guest. He said: "We are able to understand earthquakes scientifically, but we are unable to predict them due to the subsurface complexity of Earth. Hence, concerted efforts are needed to delineate the subsurface and monitor the changes in the Earth's physio-chemical properties through state-of-the-art instrumentation and advanced data processing models."

Dr Kalachand Sain, Director, Wadia Institute of Himalayan Geology, Dehradun, inaugurates a conference in Sector 30, Chandigarh, on Monday. TRIBUNE PHOTO: RAVI KUMAR

Dr N Gopalakrishnan, Director, Central Building Research Institute, said it was important that seismic events and the response of structures to these seismic events was recorded and analysed.

Prof RK Sinha, Director, CSIO, said earthquake monitoring has been one of the thrust areas of the CSIO. "Besides routine seismic monitoring, the CSIO is now diversifying into new areas for strategic and tactical

CHANDIGARH TIMES

Environment society, CSIO hold workshop for teachers

TIMES NEWS NETWORK

Chandigarh: The environment society of India (ESI), Chandigarh, in collaboration with CSIR-Central Scientific Instruments Organisation (CSIO) organized a state-level teacher orientation workshop for the 27th national children science congress (NCSC), 2019 under the CSIR-JIGYASA programme.

Over 180 teachers from various private and government schools in Chandigarh took part in the workshop. The collaboration aims to bring excellence in developing the science temperament of students as well as helping in new methodologies of experimental learning in science. In the NCSC programme, the students learn scientific process

Over 180 teachers participated in the workshop

and work upon societal problem, suggesting scientific solutions under the mentorship of a teacher. This makes their vision broader in science and its applications for the benefit of the society.

The workshop was inaugurated by chief guest Dr H K Sardana, who is the acting director of CSIO, and Dr Lalit Sharma from the department of science and technology.

Dr Lalit explained the NCSC programme and its importance in popularizing science during his inaugural spe-

Chandigarh Tribune Tue, 24 September 2019 https://epaper.tribuneindia.com/c/43962722

'Find novel solutions in artificial intelligence'

CHANDIGARH, MAY 22

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As many as 35 participants, including students, researchers, and faculty working in interdisciplinary areas participated in this workshop, which also included hands-on training sessions.

The programme was inaugurated by Prof Shyam Sundar Pattnaik, Director, National Institute for Technical Teachers Training and Research, Chandigarh. He applauded the innovative integration of artificial intelligence, agricultural applications, health care applications and start-up applications on one platform.

He also encouraged the young participants at the workshop to think out of the box and find novel solutions in the field of artificial intelligence.

Prof RK Sinha, Director, CSIO, said artificial intelligence had percolated fast due to enabling technologies such as high-speed optical fiber connectivity and fast processors. He encouraged the participants to apply this technology for the good of society.

During the workshop, a "challenge on demonstration of AI-based solutions" was also organised on showcasing artificial intelligence driven application in major sectors such as agriculture, healthcare, defence, etc. It was open to school and university students, project fellows, and project assistants. — TNS

Chandigarh Tribune

2L take part in Smart India Hackathon

TRIBUNE NEWS SERVICE

CHANDIGARH, JULY 8

The grand finale of Smart India Hackathon-2019, an event that will provide young technical minds with an opportunity to showcase their creativity in hardware products that can solve problems such as need for clean water, waste management and creation of smart vehicles, was inaugurated at the Central Scientific Instruments Organisation (CSIO) here today.

Anil Sahasrabudhe, Chairman of the All-India Council for Technical Education (AICTE), said this is the third consecutive year of Smart India Hackathon and around 2 lakh students are participating.

Dr Mohit Gambhir, Director, MHRD Innovation Cell, said students 2,522 colleges sent their entries for 198 problem statements submitted by more than 60 industries and nine Central Government ministries and departments.

In the grand finale, around 2,000 participants from 250 teams of 178 different colleges are participating. The event will continue over the next five days at 18 nodal centres in nine states and a union territory.

CSIO comes up with multi-view microscope

CHANDIGARH, AUGUST 13

To address the large requirement in the field of medical diagnosis, the Central Scientific Instruments Organisation (CSIO) has developed a portable microscope that can acquire multiple fields of views to create a bigger perspective of the sample under study.

According to a press statement, the technology for this instrument, 'Portable Multi-View Smart Microscope', was transferred to a Telangana-based private firm for commercial production and marketing.

Prof RK Sinha, CSIO Director, said: "Though conventional microscopes were widely available and being used by medical experts for various diagnostic decisions, such microscopes have a limited field of view and the technicians have to move the sample to get multiple fields of view before doing any subjective evaluation." Digital slide scanners are available to acquire the whole slide image of the sample under study, he said. Dr Suman Tewari, the developer of technology, said the system has also embedded image analytics software for blood cell classification, which is deployed with the system as a toolbox. — TNS

Chandigarh Tribune Wed, 14 Aug https://epap

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