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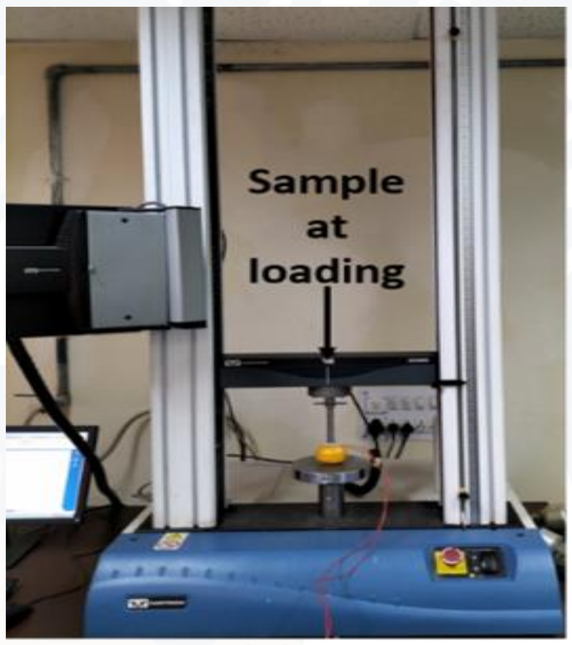
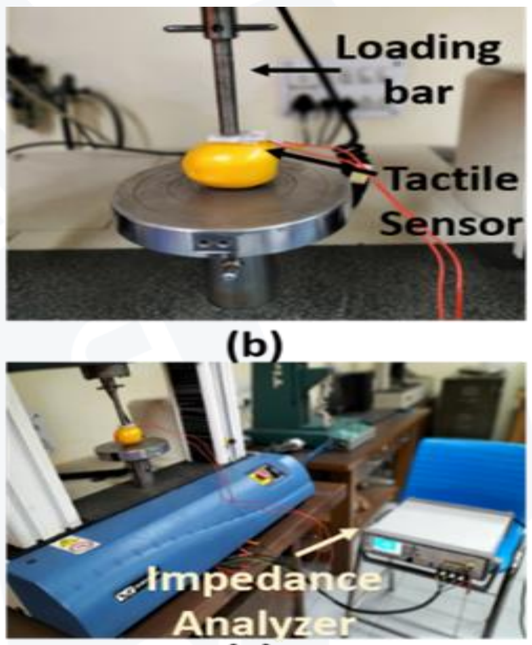
IIT Jodhpur Researcher Creates A Cost-Effective Sensor For Detecting Fruit Ripeness

CSIR-CEERI

30th March , 2023

It is cost-effective and highly sensitive tactile pressure sensor There is a need for a sensitive tactile sensor integrated into a robotic system The technology has the potential to revolutionize the way in which high-value fruits are sorted today





JODHPUR : Indian Institute of Technology Jodhpur researcher has successfully created and demonstrated a cost-effective and highly sensitive tactile pressure sensor for detecting fruit ripeness. The sensor utilizes nanoneedle textured PDMS (polydimethylsiloxane) as the dielectric layer and is lithography-free, allowing for flexible and large-scale fabrication. The team characterized the sensitivity and hysterics response of the capacitive tactile sensor and examined its transient response.

By measuring the elastic modulus and capacitance, the researchers were able to demonstrate ripeness assessment for different types of tomatoes. Dr. Ajay Agarwal, Professor & Head, Department of Electrical Engineering, IIT Jodhpur along with the researchers from IIT Delhi, and CSIR-CEERI, Pilani have published this paper on IEEE Sensor Journals (https://ieeexplore.ieee.org/document/9911182/).

In horticulture, monitoring fruit ripeness is essential to maintain their freshness and quality. Various microsensors have been developed for fruit sorting and ripeness detection. For instance, some devices rely on chemical analysis of sugar and starch content, while others use electrochemical sensing, image processing, electronics noise, and tactile sensing methods. However, chemical analysis is destructive and not applicable at all stages of ripeness, while

electrochemical sensing requires expensive equipment. Image processing for ripeness detection is limited to specific fruit families, and changes in colour are not reliable indicators of ripeness for some fruits such as kiwis, mangoes, and blueberries.

On the other hand, measuring firmness has been a dependable and automated method for assessing ripeness. Therefore, there is a need for a sensitive tactile sensor integrated into a robotic system, capable of providing pressure, mechanical stiffness, and firmness information for a sufficiently large number of fruits during harvesting and transportation.

The uniqueness of this research are as follows:

- Novel low-cost process development for the sensor fabrication;
- Suitable for ripeness estimation of various kind of fruits;
- Highly sensitive capacitive sensor.

Talking about the significance of the research, Dr. Ajay Agarwal, Professor & Head, Department of Electrical Engineering, IIT Jodhpur, said, “The development of the highly sensitive tactile pressure sensor and its integration with a robotic system has the potential to revolutionize the way in which high-value fruits are sorted today. This innovative technology offers a cost-effective solution for accurate and reliable fruit ripeness detection during harvesting and transportation, enabling high-throughput sorting of fruits based on their quality and ripeness. The implementation of this system can have a significant impact on the fruit industry, improving efficiency, reducing waste, and increasing the shelf life and overall quality of exported fruits.”

The developed sensor is capable of sorting fruits as per their ripeness and hence, by integrating the newly developed sensor with a robotic arm, it will be possible to create a high-throughput system that can effectively sort fruits based on their ripeness and quality during the plucking or transportation stages. This cost-effective system will be particularly useful for exporting high-value fruits over long distances.

Published in:

Indiaeducationdiary

Kasturba Medical College Signs MoU With CSIR-CDRI For Research Work On Antimicrobial Resistance

CSIR-CDRI

30th March , 2023

Udupi: Kasturba Medical College, Manipal, has signed a Memorandum of Understanding (MoU) with CSIR (Council of Scientific & Industrial Research) -CDRI (Central Drug Research Institute), Lucknow, to enter in a private-public partnership for developing research work on Antimicrobial Resistance (AMR).

Antimicrobial resistance (AMR) occurs when microbes evolve mechanisms that protect them from the effects of antimicrobials (drugs used to treat infections). There will be collaborative research on co-develop molecular characterization and point-of-care diagnostics for multidrug-resistant (MDR) and extensively drug-resistant (XDR) pathogens.

A team from Kasturba Medical College in Manipal led by Dr Chiranjay Mukhopadhyay, Assistant Dean and Professor of Microbiology, and Dr. Vandana KE, Professor and Head of the Department of Microbiology, represented the CSIR-CDRI Lucknow at this prestigious event. On the program's last day, Dr. N. Kalaiselvi, Director General of the CSIR and Secretary of the Government of India, graciously attended as the program's principal guest.

As per a recent media report, when speaking to the scientists and researchers, Dr N. Kalaiselvi, director general of CSIR and secretary of the government of India's department of science and technology, said, "The nation has high expectations from CSIR Labs and from these collaborations, so we must work extremely hard to make the country proud of us with our contributions to the nation. It is anticipated that this collaboration between two reputable

institutions that have distinguished themselves in the field of AMR research would present special chances and results in the quest for antimicrobial resistance-related solutions."

The Kasturba Medical College and Hospital in Manipal is India's first and only institute to get recognized as the International Reference Centre for Palliative and End of Life Care by the International Collaborative Coordinating Centre. The hospital got its recognition based on its continued clinical work, national-level policies, guidelines and research in palliative and end-of-life care.

Published in:
Medicaldialogues

CSIR-NEIST conducts programme on sustainable development

CSIR-NEIST

28th March , 2023

The CSIR-North East Institute of Science & Technology (NEIST) Jorhat and its branch laboratory here, organised a day-long program on “bioresources and sustainable development of Arunachal Pradesh”, here on Monday.

About 60 participants including, entrepreneurs, self-help groups and NGOs from different location of the state attended the programme.

Director of Institute of Bioresources and Sustainable Development (IBSD), Imphal,Prof Pulok K Mukherjee, in his address, dwelt on ethno-entrepreneurship development and utilization of natural resources, management and protection of biodiversity.

State agriculture department director Anong Lego, spoke on the importance of science & technology in the agriculture sector for socio-economic development of the state.

Scientist in charge of NEIST, Itanagar branch Dr Chandan Tamuly in his welcome address, briefly introduced about the institute and requested the particpants to come forward with their knowledge, innovation and idea for bioresources management and socio-economic development of the state.

Dr Jatin Kalita from CSIR-NEIST talked about the different technologies developed by the institute and its dissemination.

Published in:

Arunachalobserver

Steel slag road technology a boon to BRO: Niti Aayog member

CSIR-CRRI

28th March , 2023

Niti Aayog member V K Saraswat said CSIR-CRRI steel slag road technology will be a boon to Border Roads Organisation (BRO) to build long-lasting heavy-duty roads in strategic border areas. Saraswat said this on Monday after inspecting the one km stretch of Joram-Koloriang steel slag road, built by BRO in Arunachal Pradesh, along with a team of CSIR-Central Road Research Institute, BRO, Tata Steel and Lower Subansiri Deputy Commissioner Bamin Nime.

He emphasised that using alternative road materials like processed steel slag aggregates in place of natural aggregates for road construction to conserve ecology and mountainous topography in hilly states like Arunachal Pradesh.

The Niti Aayog member said Prime Minister Narendra Modi had appreciated this road project and complimented all stakeholders involved in implementation of the project.

The 1-km steel slag road section is constructed by BRO's Project Arunanak Division under CSIR-Central Road Research Institute, New-Delhi using processed steel slag aggregates supplied by TATA Steel Jamshedpur plant.

Around 1,200 MT processed steel slag aggregates were transported from Jamshedpur to Itanagar by railways and then from Itanagar to project site near Ziro in Lower Subansiri district by road.

Central Road Research Institute (CRRI) Principal Scientist and inventor of steel slag road technology Satish Pandey said that waste product of steel manufacturing units called steel slag is utilized in the form of processed steel slag aggregates to construct 40 mm thick bituminous surfacing on the BRO stretch.

Steel slag bituminous surfacing due to its inherent high strength and stiffness will offer a more durable heavy duty road surface in face of inclement weather conditions in the region, he said.

Project Arunank Chief Engineer Brig A S Kanwar highlighted the various technological initiatives of BRO across various border states including Arunachal Pradesh.

He reiterated that it was the initiative of BRO Director General Lt Gen Rajeev Chaudhary to introduce environment friendly new technologies and the use of steel slag for road construction was taken up under the aegis of Niti Aayog as an inter-ministerial collaboration task between Ministries of Defence, Science and Technology, Steel and Indian Railways.

Saraswat lauded the BRO for their path breaking work in the service of nation in extremely difficult terrain and weather conditions. He also appreciated the collaborative initiatives between the BRO, CSIR-CRRI, Indian Railway and Tata Steel to produce wealth from waste in line with the vision of Prime Minister Narendra Modi to convert waste to wealth.

CRRI Director Manoranjan Parida informed that under CSIR-CRRI technological guidance, steel slag road technology is well tested in multiple projects across India.

CSIR-CRRI had built first steel slag road at Hazira in Surat, second at NH-33 Jamshedpur and third steel slag road was recently completed at NH-66 Mumbai to Goa Highway at Maharashtra.

Published in:
Economictimes

CDRI scientist bags international fellowship for gynecological study

CSIR-CDRI

28th March , 2023

CSIR-Central Drug Research Institute (CSIR-CDRI) principal scientist Rajesh Jha has been conferred with the prestigious International Fellowship for Young Biomedical Scientists 2022-23.

The fellowship is an initiative by the Indian Council of Medical Research (ICMR) in partnership with the Department of Health Research (DHR).

Under it, Jha would be conducting advanced gynecological research at Baylor College of Medicine, Houston, Texas, USA. Jha and his group is studying the disturbed endocrine/hormone-associated molecular signaling in the ovary and uterus for disorders management and successful pregnancy.

"My group is working on the biology and management of gynecological endocrine and metabolic disorders such as endometriosis and polycystic ovarian syndrome (PCOS). These disorders are routinely observed in nearly 10% of infertile women visiting the gynecological clinic," said Jha. He said the prevalence rate of PCOS is high among Indian women and is one of the most common causes of female infertility.

"It is affecting 6% to 12% (as many as 5 million) of US women of reproductive age. Irregular periods or no periods at all, difficulty getting pregnant (because of irregular ovulation or no ovulation), excessive hair growth (hirsutism) - usually on the face, or chest, weight gain, thinning hair and hair loss from the head, acne and others are its symptoms.

A lot of research is still required for its effective treatment and causes. Such scholarships are a step toward its effective cure," he added. At Baylor College of Medicine, he will be conducting research in the field from March 27, 2023 to March 29, 2024.

Published in:
Times Of India

India's Regional Transport Aircraft will require funding of about $2 billion: CSIR-National Aerospace Laboratories, Director, Dr. Abhay Pashilkar

CSIR-NAL

27th March , 2023

NEW DELHI: National Aerospace Laboratories, established by the Council of Scientific and Industrial Research, is the principal organisation tasked with the responsibility for designing and developing civilian aircraft in the country. The organisation is currently undertaking the development of primarily three aircraft-- Regional Transport Aircraft, 19-seater Saras MK II and trainer HANSA.

In an interview to ET Infra, Dr. Abhay A. Pashilkar, Director, CSIR-National Aerospace Laboratories, stated that a clean sheet design and development of the country's first regional aircraft, referred to as Regional Transport Aircraft or RTA, a 90-seat turboprop aircraft, will require funding of up to $2 billion and the project will be executed under a Special Purpose Vehicle to ensure efficient execution.

"Typically $1 billion for full scale engineering development, and then subsequent production will be done by industry. So typically, overall, it is something like $2 billion of investment for a clean sheet design, as they call it. So the derivative design where we take an existing aircraft would be probably less expensive in that sense but that is the kind of ballpark figure," Dr. Pashilkar said.

"As of now, we are in the project definition phase, it started last April and will conclude by September of this year," he added.

However, CSIR-NAL does not plan to go all alone in executing the prestigious project. Apart from state-owned aircraft manufacturer Hindustan Aeronautics Ltd and Defence Research and Development Organisation, National Aerospace Laboratories is also looking for private sector partners, domestic as well as foreign, which should enable more funding options and diversification of the target market for such an aircraft.

"For the RTA, from the beginning we are planning to have this development in a partnership mode keeping in view that it is a bigger aircraft. So, we currently have HAL and the DRDO as our partners in the conceptual design stage and we are actively looking for industry both in India and abroad to come forward and become a partner in the supply chain, design development and eventually in the production after the aircraft gets certified," Dr. Pashilkar said.

The government so far has given in-principle approval for the full-scale engineering development of the RTA project and funding will be provided to the Special Purpose Vehicle.

Published in:
Economictimes

MoU signed between NHIDCL and CSIR-SERC, Chennai for sharing knowledge on innovative ideas and technologies in the field of highway engineering

CSIR-SERC

24th March , 2023

National Highways and Infrastructure Development Corporation Ltd. (NHIDCL), a CPSE under the Ministry of Road Transport & Highways, Govt. of India and CSIR-SERC (Structural Engineering Research Centre), Chennai signed a Memorandum of Understanding (MoU) on 23.03.2023 for sharing knowledge on innovative ideas and technologies in the field of highway engineering. The MoU was signed by Shri Chanchal Kumar, Managing Director, NHIDCL and Dr. N. Anandavalli, Director, CSIR-SERC, Chennai.

This MoU is to establish the basis of collaboration between both the parties such that the NHIDCL and CSIR-SERC can take up various activities of common interest such as sharing knowledge on innovative ideas and technologies in the field of highway engineering and other infrastructure works on mutually agreed terms and conditions. This collaboration will strengthen R&D activities in Road Sector and expected to provide lead in conducting, coordinating research, development and training in the area of Development of Highway Infrastructure.

Speaking on the occasion, Managing Director, NHIDCL, Shri Chanchal Kumar said that the

government supports the enhancement of quality research through partnerships and mentorship programmes. This MoU sets a new benchmark of Government-Academia partnership that can enhance process of learning & open up new opportunities for development of faculty in CSIR-SERC & NHIDCL's Technical officers. This also will be useful in internal capacity building.

National Highways Infrastructure Development Corporation Limited (NHIDCL) promote survey, design, build, operate, maintains and upgrade National Highways and Strategic Roads including interconnecting roads in parts of the country and which share international boundaries with neighbouring countries.

CSIR-SERC, Chennai is a premier research centre in the country with a vision of centre of excellence in education and research, producing global leaders in science, technology and management.

Both NHIDCL and CSIR-SERC, Chennai are leading premier National organisations in their respective fields and desirous of working together as a team to achieve national objectives.

Published in:
Pib

CSIR-IIIM Jammu appoints Chief Scientist Zabeer Ahmed as the new director of the institute

CSIR-IIIM

23rd March , 2023

CSIR-IIIM Jammu has appointed Dr. Zabeer Ahmed, Chief Scientist as the new director of CSIR - Indian Institute of Integrative Medicine Jammu on Wednesday, March 22, 2023. Dr. Ahmed will take over and lead this prestigious institute for the tenure of 6 years. After he recommendations of search-cum-select committee, he has been appointed as the head of CSIR-Indian Institute of Integrative Medicine Jammu.

Dr. Ahmed is a native of Jammu and Kashmir's Poonch district. The search-cum-selection committee sat from January this year and appointed Dr. Ahmed as the director After taking the charge as Director of CSIR-IIIM Jammu, in meetings with staff Dr. Ahmed encouraged and called for taking the institute in the direction of growth and excellence. CSIR IIIM is a National Institute of Council of Scientific and Industrial Research under the Union Ministry of Science and Technology.

Dr Ahmed's career started in 1997 from CSIR-IIIM itself and he has held various roles in the institute. He was promoted to the position of Chief Scientist in 2021. Several awards have been granted to him for his contributions in the scientific field which includes the prestigious Knowledge Partnership Award from CSIR. Over 70 published research papers and five patents are credited to him.

Also being the author of three books, Dr. Ahmad is an expert in pre-clinical drug development, diabetes and obesity research, rheumatoid arthritis and inflammatory diseases.

A PTI report stated that in a 25 year long career as a prominent scientist, he pioneered research frontiers in the field of metabolic diseases and rheumatoid arthritis and some of his viable breakthroughs for diabetes mellitus are being tested for clinical uses. Dr Ahmed also formulated technology on herbal research formulas for diabetes

In the past few years Dr. Ahmad worked on derivatives from Cannabis in relieving chronic diseases such rheumatoid arthritis and neuropathic pain. He is heading several CSIR-IIIM Jammu societal programmes and extension projects and has been appreciated for his role in various grant-in aids and collaborative projects.

In recent years he has also been awarded with J&K UT award for excellence in science and technology.

Published in:
Timesnownews

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