IIT-D develops low-cost sensor for monitoring concrete health

Is there anything common to a concrete bridge, a human foot and the flow of traffic? When it comes to a low-cost sensor developed at the Indian Institute of Technology, Delhi, (IIT-D), to measure vibration patterns in structures, there may be a strong link.

The piezoelectric-based sensor developed by the institute's civil engineering department was primarily aimed at structural health monitoring, but its potential applications could extend to mapping foot-sole pressure for clinical applications or as a traffic monitoring sensor buried in the carriageway.

A sensor made of a piezoelectric material such as quartz, responds to mechanical stress by developing surface charges, a phenomenon called 'direct effect'. Conversely, an electric field causes it to undergo a mechanical strain. The prefix piezo is derived from Greek, which means 'squeeze' or 'press'.

In a recent research paper, a team led by associate professor of the civil engineering department Suresh Bhalla demonstrated that a piezoelectric ceramic (PZT) patch can complement existing techniques of measuring the vibration response of a concrete structure, such as a bridge, by playing the dual role of determining strain for the structure as a whole and also at a local level. This can serve as a viable alternative to expensive accelerometers, which are widely used to carry out the health monitoring of such structures, the team says.

Bhalla, who heads IIT-D's Smart Structures and Dynamics Laboratory, has come out with a ready-to-use composite piezoelectric sensor especially for reinforced concrete structures. "The cost of such a sensor would be less than one-tenth of the cost of an accelerometer," he says, adding that the sensor practically becomes part of the structure and can serve it for very long periods without any fear of accidental damage.

Their research paper, published in the Journal of Intelligent Material Systems and Structures, notes that the performance of surface-bonded patches like the piezoelectric sensor have been shown to be as good as accelerometers and can capture frequencies as low as 1 hertz (Hz). "The sensor has also worked in the laboratory environment successfully," says Bhalla, adding that further laboratory trials and pilot studies are in progress.

Piezo composites have been in use as sensors and actuators in aerospace applications for over two decades though their entry into civil engineering is more recent. Currently, the types of sensors widely used for global structural health monitoring (SHM), or monitoring a structure as a whole, include electrical resistance strain gauges, fibre-optic sensors, piezo-electric accelerometers and ultrasonic pulse transducers.

"PZT is currently used for active sensing at an extremely local level to detect flaws and damage. The jury is still out on structural global level structural health monitoring (SHM) using PZT, as it is used for local-level response," says IIT Roorkee director Pradip Banerji. He is also on the executive council of the International Society for Health Monitoring of Intelligent Infrastructure.

In a subsequent paper published in the Journal of Experimental Techniques, Bhalla's team demonstrated the use of the piezo sensors for monitoring traffic flow by embedding it below the carriageway.

"Compared with other traffic sensors available in the market, the proposed sensor is very cost-effective and warrants minimal data processing efforts and hardware costs," the paper noted. The sensor had successfully passed tests under different traffic types and it could be calibrated for action under real situations, it said.

The team also collaborated with the Centre for Bio-Medical Engineering at IIT-D to adapt the same piezo sensor for biomedical applications such as mapping the foot-sole pressure and its distribution. "This is specially relevant for diabetic patients whose foot pressure distribution is sometimes of concern. Such patients tend to lose their sensation on the sole and are prone to exerting very high foot pressures leading to foot ulcers," he says.

The team has submitted a proposal for transfer of the technology to a few companies under IIT-D's Foundation for Innovation and Technology Transfer. Bhalla says the sensor has an edge because it can be used with minimum intervention and is less expensive.

Over the past few years, the quest for better sensors for SHM has driven research into areas such as wireless sensor networks and system identification techniques to interpret data and assess the condition of structures and for life extension of old structures. According to Banerji, some of the key challenges currently are to develop substantive and automated interpretation of online SHM data that can provide alerts when a structural or functional deterioration occurs in a structure, and the integration of data from various sources.

-- Ajay Sukumar
Country in a higher education emergency, says report

Our Bureau
Bangalore, March 26

The TeamLease India Labour Report 2012 suggests the country is in a ‘higher education emergency’ situation.

The reasons for this are challenges of enrolment, physical access and employability.

The study says the country’s higher education enrolment ratio is 11 per cent, which half of the world average and way behind that of developed countries (54 per cent).

The report highlights three banes plaguing the higher education scene: not enough children go to college, not enough children have physical access to college and many colleges give degrees but don’t lead to jobs.

The study titled, ‘Massifying Indian Higher Education: The Access and Employability Case for Community Colleges’ argues for solutions that would combine the needs of policy makers, employers and the youth.

“Community colleges could be an important innovation because they are part ITI, part-college and part-employment exchange,” says Mr Manish Sabharwal, Chairman, TeamLease Services.

Enrolment in higher education is about 1.6 crore in 2012. The community college offering two year programmes could increase enrolment by 8 million from small towns, unorganised workers and the traditionally disadvantaged, Mr Sabharwal said.
Tech schools to get global accreditation

Our Bureau

New Delhi, March 26

India's burgeoning engineering student population may soon get the opportunity to stand tall alongside its western peers from "internationally accredited" institutions.

At the 1st World Summit on Accreditation organised in New Delhi, chair of Washington Accord, Dr Hu Hanrahan, said India's National Board of Accreditation (NBA) is well on its way to becoming a signatory, though he did not comment on the time frame.

Once NBA becomes a signatory, graduates of programmes and institutions accredited by it would be at par with students from institutions of 14 other signatory bodies, including ones in the US, the UK, Japan and Singapore.

While inaugurating the event, the Minister of Human Resource Development, Mr Kapil further said the Government is conceiving and putting into place a meta-university, which would involve universities collaborating with one another and giving students the option to choose courses ranging across subjects.

He said he expects this meta-university, which would also allow students to get degrees from more than one university at a time, to take off in the next academic year.

However, raising questions on the quality of education in India, corporate stakeholders said only 20-25 per cent of engineers and management graduates are employable.

Mr Sibal hoped that the National Accreditation Regulatory Authority for Higher Educational Institutions Bill introduced in 2010 will be passed within this year.

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Soon, Indian BTech degrees may be recognized abroad

Himanshi Dhawan & Manash Pratim Gohain | TNN

New Delhi: Engineers with undergraduate degrees will find it easier to seek jobs and opportunities for higher studies abroad from 2013, if India’s bid to join the elite Washington Accord for international accreditation is accepted.

To face US audit, P 15

If it comes through, undergraduate engineering degrees from India will be brought on a par with those of the US, UK, Australia, Canada, Singapore, Japan, New Zealand, South Africa and six other nations, easing mobility for Indian undergraduate engineers.

The National Board of Accreditation, under the aegis of All India Council for Technical Education, plans to bid to become a permanent member of the Washington Accord in June 2013.

Said G Prabhakar, an NBA member and president, Andhra Pradesh chapter of Institution of Engineers (India), “In 2013, NBA will be a full member of the Washington Accord. The accord recommends that the graduates of programs accredited by any of the signatory bodies be recognized by other members as having met academic requirements for entry to engineering.” India was granted the status of a provisional member in 2007.
Desi BTech set for global currency

Himanshi Dhawan &
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“In 2013, NBA will be a full member of the Washington Accord. The accord recommends that the graduates of programs accredited by any of the signatory bodies be recognized by other members as having met academic requirements for entry to engineering,” said G Prabhakar, an NBA member and president, Institution of Engineers (India)-Andhra Pradesh chapter.

However, India is yet to invite the Washington Accord to audit its accreditation system, a crucial process to become a full member, despite the country being granted a provisional status in 2007. Hu Hanrhan, chair of the Washington Accord, refused to commit to a timeline for India’s membership. In India for the first World Summit on Accreditation 2012, he said the process was underway.

But even if India is granted membership, only about 20% of the 4,000-odd Indian institutes may make the cut.
AICTE approves 76 new tech institutes, 14 in state

Approval comes despite request from states not to permit new colleges

MIHIKA BASU
MUMBAI, MARCH 25

THE All-India Council for Technical Education has approved 76 new technical institutes across the country despite a request from several states not to permit new engineering institutes for the 2012-'13 academic year.

The approved colleges belong to disciplines like engineering, management, pharmacy, MCA, hotel management and architecture and the number of seats available will be approximately 20,000.

Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu and Orissa had cited huge vacancies in their engineering institutes while asking the council not to permit new institutes. The state had recommended 92 applications in management, engineering, pharmacy etc, of which 14 have been approved in the first phase. As many as 22,000 engineering seats had gone vacant in the state in 2010, while it was 32,000 engineering and 16,000 management seats in 2011.

Asking if the vacancy situation will be worse this year with the addition of new institutes, an official from the Directorate of Technical Education (DTE) said the exact situation would emerge only after the admission process starts.

After several extensions of the final date to submit applications to start new institutes, the AICTE had received 362 proposals this year to start new technical institutes and 307 applications to begin new polytechnics — 669 applications in all. This was a massive decline from 2010, when the AICTE had received 2,176 proposals. "At a meeting held recently, we have cleared 76 proposals. They are spread across the country. Work on the remaining applications are in progress and a decision will be taken by this month-end," AICTE chairman S S Mantha said.

There has been a steady growth in the number of AICTE-approved technical institutes in the past few years — from 4,491 in 2006-'07 to 8,361 in 2011-'12. The intake too has gone up from 7,50,797 in 2006-'07 to 20,46,611 in 2011-'12. "We cannot suddenly stop giving permissions. We are giving approvals to all those who have strictly met the criteria specified by us," Mantha says.
'O SHU... http://library

138 PVT COLLEGES LOOKING TO SHUT DOWN

Vanita Srivastava
vanita.srivastava@hindustantimes.com

NEW DELHI: As many as 138 private institutes across the country, including 65 management and 15 engineering colleges, have sought permission to close from the All India Council for Technical Education (AICTE). This is more than three times the number of institutes that had come up with the request last year.

“We have received applications for closure from 138 institutes. But the final closure can be done only after we get a no-objection certificate from the state governments and the universities concerned,” said SS Mantha, chairman, AICTE.

MOST GANGA PROJECTS DON’T HAVE CLEARANCE

RASHME SEHGAL
NEW DELHI, MARCH 26

Most of hydroelectric power projects in the Ganga’s Alaknanda and Bhagirathi river basins have come up in the teeth of public opposition with even water experts from IIT Roorkee having warned that even the minimum water flow in the Ganges had been adversely affected with their construction.

It was keeping this in mind that the former environment minister, Mr Jairam Ramesh, had issued a stop work order on the Srinagar project on June 30, 2011. The order has not been withdrawn even though work on the hydro-project is continuing till date.

Most of these hydro-projects are already steeped in controversy with local activists highlighting how work on these projects has kickstarted without their receiving the requisite environmental clearances.

MoEF’s expert appraisal committee examined environmental violations in Phata-Byung and Singoli-Bhatai projects on the Mandakini had twice recommended work be halted due to green violations.
हीमोफ़्लोरिया से जूझ रहा है आईआईटी छात्र मोहित

JNU online admissions a hit, more than 52,000 apply

Officials said the shift to online admissions has not just made the process convenient, but has also managed to eliminate selling of forms in black market

Officials said the shift to online admissions has not just made the process convenient for applicants, but has also managed to root out a bigger problem—selling of admission forms in the black market

Jawaharlal Nehru University sold about 15,000 forms through other methods.

Jawaharlal Nehru University had made the application process to 121 of its courses online this year.

“Those who applied online can also make the payment online and will have admit cards sent to their e-mail IDs,” the university has said.

NANDINI THILAK
NEW DELHI, MARCH 28

T HE decisions to make ad-
misions process at
the Jawaharlal Nehru Uni-
versity (JNU) online from this acad-
emic year has proved successful with over 52,000 applicants of the more than 65,000 who have ap-
plied this year opting to complete the process online, university offi-
cials said.

“Those who applied online can also make the payment online and will have admit cards sent to their e-mail IDs,” the university has said.

The University now plans to make copies of old question papers, to prepare for the entrance tests, also available online. Currently, students have to remit Rs 10 either in person or post to get these booklets.

“We had difficulties in taking the shift to online admissions as there was not enough server space this year to put up such a huge amount of data. But from next year, it will be available free of

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Indian Express ND 27/03/2012

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Rashtriya Sahara ND 27/03/2012

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मोहित की स्थिति को अभी समझने का है। यह की मेरे पास जो भी पूर्वकाल देखा गया है कि हीमोफ़्लोरिया से लड़ने के लिए मेरा पास कुछ नहीं है। इसलिए एस प्लाटफर्म को ध्यान देना चाहिए कि इसके बाद भी स्थिति समझने के लिए कहीं भी मेरे घर के किसी भी लोग के कारण मेरा मन कुछ नहीं है। इसलिए यह भी कहा जा सकता है कि मेरे पास कुछ नहीं है। इसलिए एस प्लाटफर्म को ध्यान देना चाहिए कि इसके बाद भी स्थिति समझने के लिए कहीं भी मेरे घर के किसी भी लोग के कारण मेरा मन कुछ नहीं है। इसलिए यह भी कहा जा सकता है कि मेरे पास कुछ नहीं है। इसलिए एस प्लाटफर्म को ध्यान देना चाहिए कि इसके बाद भी स्थिति समझने के लिए कहीं भी मेरे घर के किसी भी लोग के कारण मेरा मन कुछ नहीं है। इसलिए यह भी कहा जा सकता है कि मेरे पास कुछ नहीं है। इसलिए एस प्लाटफर्म को ध्यान देना चाहिए कि इसके बाद भी स्थिति समझने के लिए कहीं भी मेरे घर के किसी भी लोग के कारण मेरा मन कुछ नहीं है। इसलिए यह भी कहा जा सकता है।

हीमोफ़्लोरिया है। इसका मान्यता एक लोग दिखाया जा रहा है।

एस प्लाटफर्म के लिए एक अवधारणा तैयार करना जरूरी है।

आधिकारिक तरीक़े, विद्यार्थियों के लिए एक अवधारणा तैयार करना जरूरी है।

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हीमोफ़्लोरिया है।
INFY, HCL TECH, COGNIZANT ORGANISING MEETS

IT Cos Pamper Placement Officers for Best Talent

Efforts aimed at getting best interview slots when hiring from colleges, say analysts

SANGEETHA KANDAVAL & SHRUTI SARKARWAL
CHENNAI | BANGALORE

Once reserved for market analysts and key clients, Indian information technology companies are now pampering college placement officers by taking them on domestic and foreign trips as they seek to hire the best talent from Indian campuses ahead of competition.

Over the years Cognizant has been taking placement officers to cities like Bangkok and Dubai while others have been holding their offsites within their campuses. Infosys has also joined the race this year, although with a modest start in domestic locations. Indian IT firms depend on campus recruits for a bulk of their hiring every year, making job offers to thousands of students every year. In this financial year for instance, Infosys is hiring over 20,000 students from campus while TCS is hiring over 30,000.

Such events, some analysts say are part of efforts to get the best interview slots when hiring from colleges. Infosys, which insiders say lost out in the talent scramble because it failed to get the so-called “slot zero” has now started Sanvaad 2012, where the Bangalore-based firm hosts placement officers in Mysore, Pune, Hyderabad, Bhubaneswar, and Chandigarh. Some 110 placement heads from a similar number of engineering institutions across the country are being invited, according to a company spokesperson. Through the event, Infosys seeks to impart skills, including “negotiation skills” to help these placement officers in their current roles.

Like Infosys, HCL Technologies too started a similar event last year, organizing placement officer meets in Bangalore, Delhi and Chennai. “This conclave helps us in sharing performance feedback of students with their respective colleges, the joining dates are shared, gives us the opportunity to build long lasting relationships,” said Ravi Shankar, senior vice president, human resources at HCL Technologies.

Much like an analyst meet, these events too witness participation from senior company executives, sometimes including the CEOs and heads of HR who explain the company’s performance, new initiatives and opportunities for students. “Such meets are a forum for the company to share important information and set expectations,” Priti Rajora, vice-president and global head, talent acquisition, Wipro Technologies said. “It is also an opportunity to network amongst the community.”

Cognizant started a similar initiative nearly six years back called, ‘Defining Dialogues,’ which is a forum to “discuss and share ideas of mutual interest, thereby furthering industry-academia collaboration,” according to Sriram Rajagopal, the Nasdaq-listed company’s vice-president, human resources. “By no stretch of imagination should Defining Dialogues be seen as a recruiting platform.”

TCS said it started a similar initiative because they wanted to understand the needs of placements officers as well as tell them about the company.

However, strategic HR advisor and the former HR head of Infosys Hema Ravichandar, does not believe this is a knee-jerk reaction from companies focused only on getting the first slot on campus. “One should not look at these initiatives tactically, it is the building of an enduring and sustainable relationship,” she Ravichandar said.

Placement officers say such forums may help in building bridges but at the end of the day, students have the final say.