

VidyaVikas Education Trust's



Universal College of Engineering

(Permanent Unaided | Approved by AICTE, DTE & Affiliated to University of Mumbai)
(Accredited with B+ Grade by NAAC)

ELECTROBUZZ

ELECTRONICS DEPARTMENT

MAGAZINE



Universal College of Engineering

(Permanently Unaided | Approved by AICTE, DTE & Affiliated to University of Mumbai)

Gujarati Linguistic Minority Institution

Accredited with **B+ Grade**
in 1st cycle of accreditation by



NAAC
NATIONAL ASSESSMENT AND
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Department of Electronics Engineering





Tahuko 2019



THIS EVENT WAS CONDUCTED ON 5TH OCTOBER 2019. THIS EVENT STARTED WITH MAA DURGA'S ARTHI. IN THIS EVENT TEACHERS, STUDENTS AND ALUMINIS PARTICIPATED WITH ENTHUSIASM. THE BEST ONES WERE AWARDED WITH PRIZES AND GIFTS.





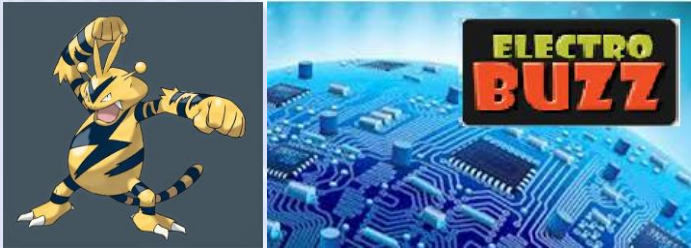
TECH TRENDS

Smart Marbles Equipped With Sensors For Detecting Pipeline Damages

Imagine a group of small-sized balls equipped with sensors flowing through your intestines in order to detect thickening. Or inspecting hard-to-reach environments such as pipeline networks of drinking water and oil systems to detect leakage. It all sounds like science fiction but can soon turn out to be a reality.



A swarm of smart marbles. One of the balls has been opened up, showing the circuit boards. After much trial and error, a team of researchers led by Peter Baltus, professor of microelectronics at the department of Electrical Engineering at Eindhoven Institute of Technology, the Netherlands, have developed small circuit boards equipped with sensors that can easily fit into small golf-sized balls or marbles. While floating inside a pipeline network, these marbles have the ability to detect any obstructions, damages or leaks that are present.



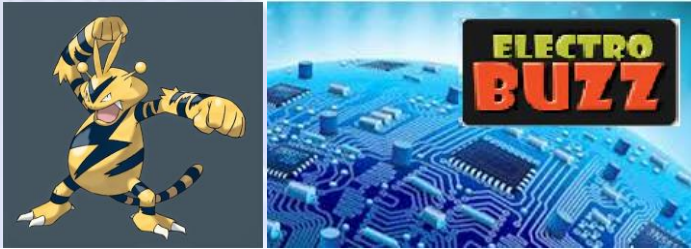
Create Voice Controlled Applications With Arduino IoT Cloud And Alexa

This integration of Alexa with the Arduino IoT Cloud enables interactive communication with customisable user-interface. With the launch of the Arduino Alexa Skill, now you can easily and securely integrate Alexa into your Arduino IoT Cloud for enabling voice-controlled projects, be it to regulate the room temperature, check the coffee machine or monitor the watering of plants. And that too without any additional coding.



Using Alexa is quite simple. Just ask and Alexa will instantly respond. Some of the other things you can do with voice-enabled commands:

- Change the colour and the luminosity of lights.
- Regulate temperature and detect any activity with the help of motion sensors.
- Trigger switches and smart plugs ON or OFF.



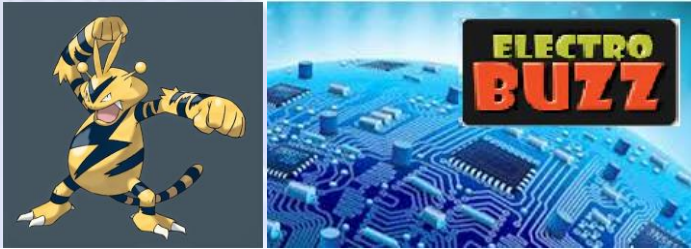
AI Tells How Certain Pieces Of Music Affects Our Brain

In the past, scientists tried to better understand the impact of music on the body, brain and emotions by analysing MRI scans. With the help of AI, scientists can now look forward to discovering that in a much deeper manner.

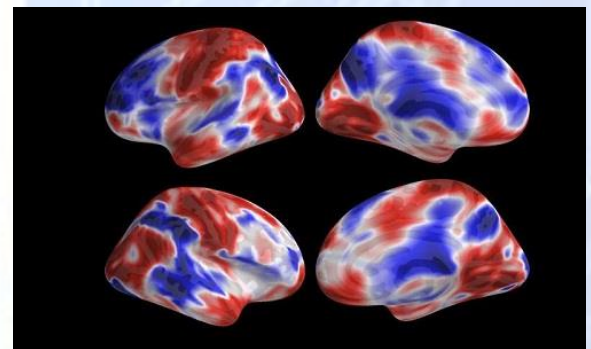


The question of why certain music affects a listener's emotions in unusual ways, has remained on our minds for quite some long. Now, a study by a team of researchers from the USC Viterbi School of Engineering, US, attempts to answer that with the help of artificial intelligence.

A neuroimaging test was conducted on a group of volunteers as they listened to three unfamiliar pieces of music. This ensured that there was no element of listener's memory that was attached to any particular music. To measure physical reaction, 60 people listened to music on headphones, while their heart activity and skin conductance were measured. The same group also rated the intensity of



emotion (happy or sad) from 1 to 10 while listening to the music. The researchers observed their heart rate, skin response (or sweat gland activity), brain activity and subjective feelings of happiness and sadness. Then, the computer scientists processed the data using AI algorithms to determine which auditory features people responded to consistently. From the results, it was concluded that dynamics, register, rhythm and harmony of music were directly related to listeners' response. "Taking a holistic view of music perception, using all different kinds of musical predictors, gives us an unprecedented insight into how our bodies and brains respond to music," said Tim Greer, a computer science PhD student and a member of the USC Signal Analysis and Interpretation Laboratory (SAIL).



USC researchers (From top right, clockwise): Tim Greer, Shrikanth Narayanan, Ben Ma.

It all lies in the rhythm

The researchers noted that music had a powerful influence on the auditory of the brain called the Heschl's gyrus and the superior temporal gyrus. The brain had a lively response when listening to pop music with dancing beats. They also found that by changing the dynamics, rhythm and timbre, or by introducing new



instruments (that had different rhythm and dynamics), the gyrus became activated and showed an increased response.

“If a song is loud throughout, there’s not a lot of dynamic variability, and the experience will not be as powerful as if the composer uses a change in loudness,” said Greer. “It’s the songwriter’s job to take you on a rollercoaster of emotions in under three minutes, and dynamic variability is one of the ways this is achieved.”

So, if you’re consistently listening to loud and heavy music like black metal, then you’re probably not going to see an active response in the brain. However, if that loud music constantly changes from a quiet verse to loud chorus and back again, then an active response can occur.

Increased skin and brain response

It was also discovered that the skin response corresponding to secretion of sweat, increased after the introduction of a new instrument or near the build-up of music. “When each new instrument enters, you can see a spike in the collective response of the skin,” said Greer. By using algorithms to analyze data gathered in the lab, the scientists were able to look at how people felt while listening to music over longer periods of time, not only from brain scans, but also combining data from other modes. “Novel multimodal computing approaches help not just illuminate human affective experiences to music at the brain and body level, but in connecting them to how actually individuals feel and articulate their experiences,” said Professor Shrikanth (Shri) Narayanan, study co-author, Niki and C. L. Max Nikias Chair in Engineering and professor of electrical and



computer engineering and computer science. Music is known for providing calmness in stressful situations. The researchers hope that this study will provide a new insight into how different types of music can positively manipulate our emotional responses and whether the intent of the composer matches the listener's perception of a piece of music.

The above study titled "A Multimodal View into Music's Effect on Human Neural, Physiological, and Emotional Experience," was presented at ACM Multimedia 2019.



Flexible And Sturdy Robot That Can Extend Itself In Any Direction

The robot's flexibility allows it to navigate through narrow spaces, while its sturdiness is powerful enough to lift heavy loads with ease. The gradual rise of automation in today's factories and warehouses has resulted in robots performing difficult tasks in less time. Usually, they manage to easily navigate through open spaces but find it quite challenging when it comes carrying out a task through hard-to-reach spaces such as selecting an object from a cluttered workbench or operating upon the complex machinery of a car engine.



The new "growing robot" can be programmed to grow, or extend, in different directions, based on the sequence of chain units that are locked and fed out from the "growing tip," or gearbox.

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Inspired by how plants grow, engineers at the MIT have developed a robot that has the ability to extend itself in different directions and lengths. With the help of an attached extension mechanism, the robot is flexible enough to twist and turn in any desired configuration, without reducing its capability to lift heavy loads. The robot can extend and retract itself as per the required task.

“The realization of the robot is totally different from a real plant, but it exhibits the same kind of functionality, at a certain abstract level,” says Harry Asada, professor of mechanical engineering at MIT.

Motorised movements

The robot’s gearbox consists of a loose chain of interlocking blocks. Within the box, a system of gears and motors perform the expansion and contraction of the connected chain block units to carry out pick-and-place operations. As the motor rotates the chain around a winch, a second set of motors lock certain block units in place to create a rigid support. The entire system function resembles a growing plant, in which the stem lengthens itself as more and more nutrients are fed to it.

The robot can be programmed to lock together certain units while leaving others unlocked, to form specific shapes, or move in certain directions.

“It can be locked in different places to be curved in different ways, and have a wide range of motions,” says Tongxi Yan, a former graduate student in Asada’s lab, who led the work.



DEPARTMENTAL ACTIVITIES

SOLAR LAMP WORKSHOP

The solar lamp workshop was the part of the Gandhi Global Solar Yatra (GGSY) and Unnat Bharat Abhiyan. This workshop was organized on the 2nd October 2019, where Students assembling their own solar study lamps, marking the 150th Birth Anniversary of Mahatma Gandhi and International Day of Non-Violence towards Environment.

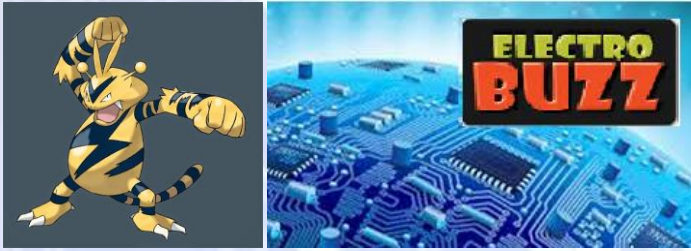
There was a huge response from our students and 175 students from different departments participated in this event. It was organized in association with innovation cell

Here the teachers from colleges were trained online and were told to complete the online course for training the students participated in solar lamp workshop.



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NAVRATRI - SARASWATI POOJA

Navratri is celebrated to observe Devi Saraswati, the goddess of music, wisdom, arts and science. The word 'avahan' specifies the invocation and hence, in this ritual, means to invoke the blessing of Goddess Saraswati. The last three days of Navratri is usually dedicated to worship Devi Saraswati. As per the Hindi traditions, Saraswatiavahan is observed on the mahasaptami (7th day) during the ShuklaPaksha in the Hindu calendar month of 'Ashwin.'

So on that day, electronics and telecommunication department has performed Devi Saraswat , lab equipmentspooja; etching“SaraswatiYantra” and adored it with flowers.



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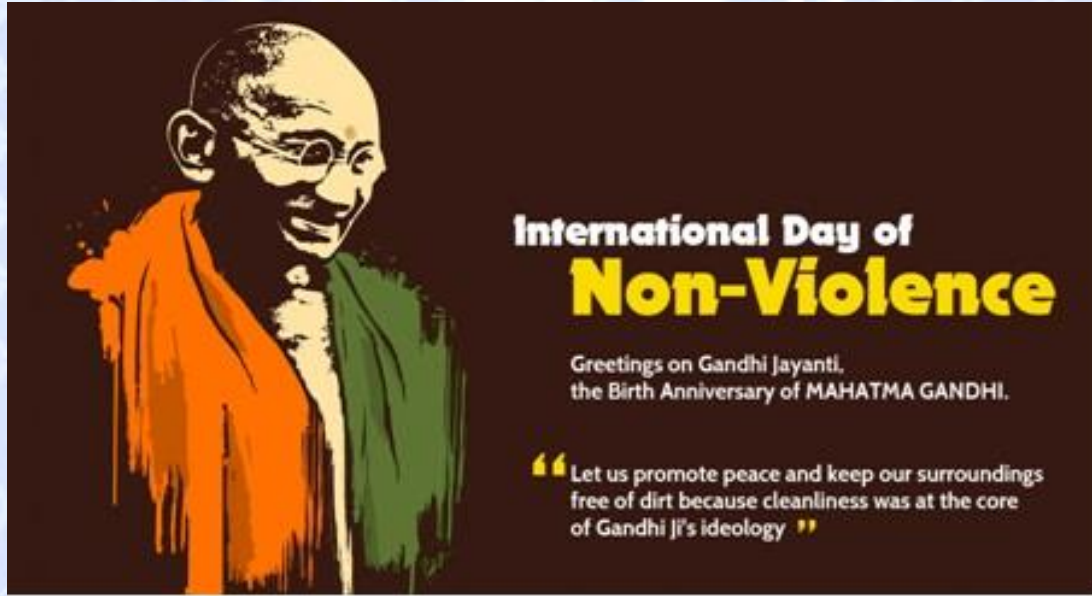


**OUR STUDENTS WILL BE DOING INTERNSHIP IN
FOLLOWING COMPANIES:**

- 1) RAILWAY VIRAR YARD
- 2) STELMEC LTD
- 3) J GROUP ROBOTICS
- 4) NISSAN
- 5) SAGE AUTOMATION



INTERNATIONAL DAYS



The **International Day of Non-Violence** is observed on 2 October, the birthday of **Mahatma Gandhi**. On 15 June 2007 the United Nations General Assembly voted to establish 2 October as the International Day of Non-Violence. The resolution by the General Assembly asks all members of the UN system to commemorate 2 October in "an appropriate manner and disseminate the message of non-violence, including through education and public awareness."



International Day of the Girl Child



International Day of the Girl Child is celebrated annually on **11 October** to highlight and draw attention towards the challenges that girls' face. It is also necessary to focus on their human rights and empowerment.

Since 2012, International Day of the Girl Child is being celebrated every year. Its main objective is to empower women and help them to get their rights so that they can face the challenges all over the world and meet their needs. At the same time, spreading awareness about eliminating gender abnormalities against girls around the world.

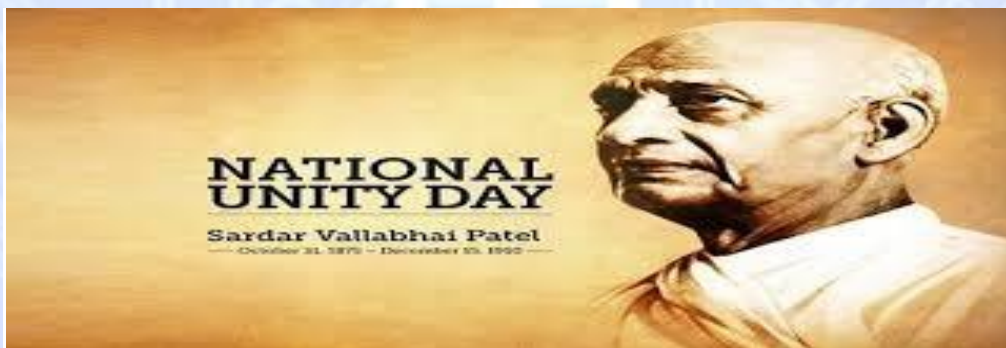


13 OCTOBER

INTERNATIONAL DAY FOR DISASTER RISK REDUCTION



The **International Day for Disaster Reduction (IDDR)** an international day encourages every citizen and government to take part in building more disaster-resilient communities and nations. The United Nations General Assembly designated October 13 as the International Day for Natural Disaster Reduction as part of its proclamation of the International Decade for Natural Disaster Reduction.



Rashtriya Ekta Diwas (National Unity Day) (31 October) was introduced by the Government of India in 2014. The official statement for Rashtriya Ekta Diwas by the Home Ministry of India cites that the National Unity Day "will provide an opportunity to re-affirm the inherent strength and resilience of our nation to withstand the actual and potential threats to the unity, integrity and security of our country."

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