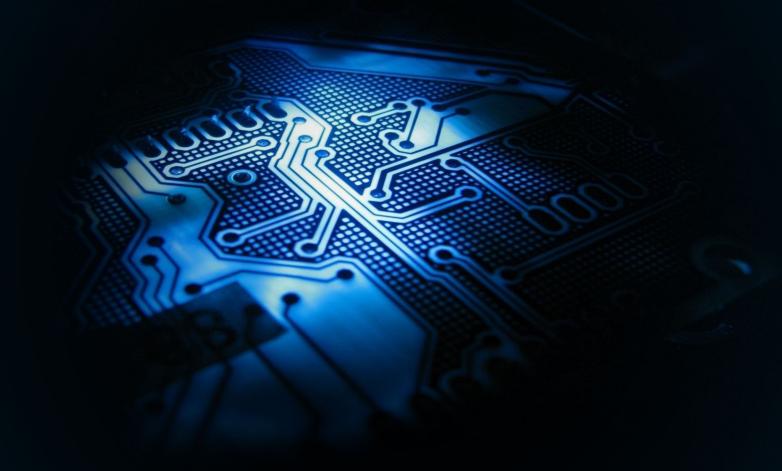




ELECTRICT



WHERE IDEAS FLOW WITHOUT

~~~=SISTANC=~~~





# Principals talk

Technical education is the backbone of every nation and being the principal of LDCE, I believe that the teachers and students have a responsibility to ensure that every individual has the opportunity to receive high quality education from technical to practical and beyond. Our motive has always been to contribute for sustainable development of nation through achieving excellence in technical education and research while facilitating transformation of students into responsible citizens and competent professionals. This exclusive departmental magazine is one such opportunity which will enable the students of electrical department to showcase their talents and exchange technical knowledge amongst themselves.

# From HODs Desk

Dear Reader,

It is rightly quoted that "A positive attitude causes a chain reaction of positive thoughts, events and outcomes. It is a catalyst and it sparks extraordinary results" I am proud to say that the dedicated team of faculties and students made it possible to publish the first issue of our departmental magazine 'Electri.ct- where ideas flow without resistance' The magazine nicely reflects that we at Electrical engineering department, are committed to continuous and constant growth in tune with the vision and mission of our institute.

The achievements of faculties and students during the recent past are nicely included in the current issue. It is evident from the contents of this magazine that the faculties and students at L D College of Engineering, Ahmedabad are really the gems in all aspects of life. I would like to congratulate Prof. N V Sinha, Prof. U L Makwana, Prof H N Raval and Prof M R Vasavada who have mentored the enthusiastic team of students. The efforts put on by Muskan Biala, Shivangi Parmar, Shivani Pandey, Balaji Sengundar, and Vignesh Sengunthar in the publication of this magazine are worth to appreciate. I extend my warm wishes for consistent publication of this magazine. We will be happy to receive feedbacks and suggestions from all the readers.



**HOD**Dr. MAHIPALSINH CHUDASAMA

# Facultys Vision

#### "Coming together is a beginning, keeping together is progress and working together is success".

ducation does not end merely with the acquisition of a degree. It is rather a continuous process which aims to nurture a student with just the right balance of academics and creative experiences in co-curricular and extra-curricular areas to produce an individual who is an asset to the society. Let no one forget that the hands which hold text books today will hold the reins of the country tomorrow.

Amidst the busy schedule of a semester, with exams, surprise tests and all those assignments that make us want to bang our head on the wall, we tend to lose track of other simple things that we are capable of, things that bring us joy and satisfaction. This is an attempt by the Department of Electrical Engineering, LDCE, to help our students unleash their intellect and creativity and present a beautiful blend of technology and arts.

The inaugural issue of **Electri.CT** also gives a brief account of the important events held up to September 2018. This magazine is intended to be published twice in an year. This is the first step - together, we have to cross numerous milestones. This maiden issue of **Electri.CT** should inspire all of us for a new beginning.....

### **BUILDERS OF ELECTRI.CT**



VIGNESH SENGUNTHAR Editor



**MUSKAN BIALA** Editor



SHIVANI PANDEY Editor



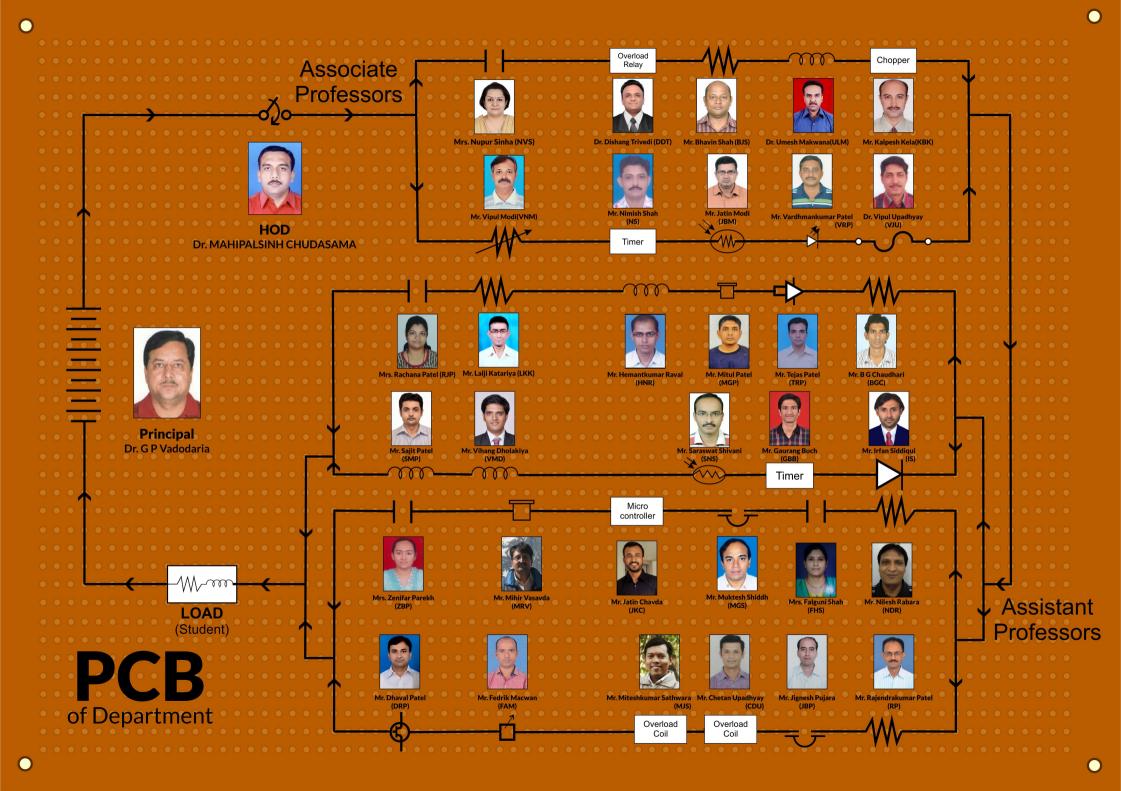
Reporter



BALAJI SENGUNDAR SHIVANGI PARMAR Reporter



**HARSH SHAH** Photographer





#### KANDARP VIRENDRA SHROFF

Monoact- Champion for 2 times at PDPU and IIM Worked at Doordarshan

MIMICRY Champion at St. Xavier's college

Led a street play team which became Champion at 7 different

universities such as Nirma, PDPU, DAIICT, IIM, etc Led college Youth Festival team which became champion at

state level for two consecutive years

Other achievements in field of theatre with team.



**DHARMIK TRIVEDI** 

2<sup>nd</sup> in Zonal & 3<sup>rd</sup> in Interzonal level in MIMICRY (Xitij 2017)

1st in ONE ACT PLAY in zonal level (Xitij 2016)

1st in MIMICRY at Annual Cultural Fest of DAIICT, NIRMA & ADANI.

1\* in STAND UP COMEDY in Annual Fest of PDPU 2016

1st in ONE ACT PLAY, 2nd in STAND UP COMEDY in Sahityasarita 2016

1st in SKIT and 2nd in SCREEN PLAY WRITING in Sahityasarita 2017





**SHIVANI PANDEY** 

3<sup>rd</sup> Position in Poetry Competition Sahityasarita 2018

#### **JEET DHORIYANI**

2016(First Year)

Zonal Winner

Represented GTU in Westzone (QUIZ)

2017 (Zonal Winner)

Interzonal Winner

Acquired 3rd in Westzone and 4th in Nationals.

3<sup>rd</sup> in AMA the Great India Quiz





#### Recipient Of Top Ranker 2018 from **Shri Dewang Mehta IT Awards**

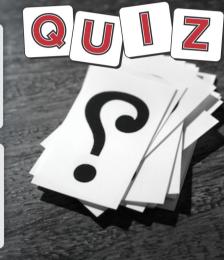
Patel Darshan Babubhai Rana Prajesh Dineshchand Prince Dadhaniya Muskan Biala













#### **PRATEEKSHA MEHTA**

District Champion 2k18 Khel Mahakumbh- Basketball



#### VIGNESH SENGUNTHAR

1st position in Badminton Zonal in 2017.

Chief Organizer of Lakshya 2018.

One of the Chief Member of Robocon Team LDCE.



Project: Applications of Solar

Team: Krupali Hakani, Namrata Motiramani,

Manan Patel, Ashit vaghela

Project Title:-Automatic Wheelchair Control Team: Alpesh L. Mali, Yogesh K. Sarvaiya

Generation of high frequency AC by Tesla Coil

Team: Vidhin Patel, Parth Patel, Sakirali Vijapura, Piyush Thakor







n the year 2018, the IEEE LD SB management was moved from EC branch to Electrical branch.Under the leadership of HOD (Electrical Department) Dr MC Chudasama, IEEE conducted a series of events successfully. A lecture by Dr Manan Thakker, a renowned Cyber Crime lawyer made the students familiar with cyber safety. He provided tips to the students to safeguard them from cyber crimes. He also provided information about various existing laws of indian constitution regarding cyber crimes. An orientation ceremony for IEEE SB LDCE was also held wherein students were made aware of the working, offerings and benefits of IEEE. It was followed by a special technological quiz session by auizmaster Jeet Dhorivani. IEEE STEP LECTURE SERIES PROGRAM at LDCE. An expert lecture program under the banner of IEEE STEP LECTURE SERIES was held on 6th October 2018 at L.D. College of Engineering, Ahmedabad. The program was divided into two sessions. Session 1:Dr. Vijay Shah, Vice-President of ABB India, was the speaker for the first session. He spoke on the topic of "ELECTRONICS IN POWER SYSTEMS: BREAKING THE MYTHS". Starting from the rudimentary developments in the electrical field, he made the audience familiar with various current and upcoming trends in the field of power systems. It was followed by debunking various myths stunting the adoption of newer technologies. Session 2:Dr Gopal Gajjar, professor at IIT Bombay and member of POWER ANSER Lab, was the expert for the second session. This session started after lunch break from 2pm to 4pm.He spoke on "Wide area Fequency measurements in Power systems".

## **Tree Plantation**

lantation Drive took place from 31.7.2018 to 4.8.2018 by Electrical Faculty members along with the students team of L D Engineering College .Plants were obtained from AMC ,free of cost .Bio diversified 35 saplings consisting of – Neem, Bargad, Gulmohar, Asopalav, Badam and other flowering plants were planted at the Electrical Engg. Department of L D College of engineering for the beautification of college. Above all ,90 first year Engineering students participated in it.







# **IOT** (Internet of things)

he internet of things, also called internet of everything is a network of physical objects or things embedded with electronics, software, sensors and connectivity to enable objects to collect and exchange data. The internet of things allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration between physical world and computer based system and resulting in improved efficiency, accuracy and economic benefit.

## **IOT Workshop**

nternet of Things (IOT) workshop is an initiative taken by the Electrical Department of LDCE to give students the confidence to build their own products by providing thorough knowledge of family of microcontrollers, sensors, software etc, enabling the innovators to convert their ideas into a "working prototype".

The 40 hour workshop covers comprehensive topics like

- 1. What is IOT?
- 2. Introduction to microcontrollers & basic electronic.
- 3. Sensors and reading real time values
- 4. Data transmission

Through lectures & practicals.

## **EVT**(Electric Vehicle Technician)

An electric vehicle, also called an EV, uses one or more electric motors or traction motors for propulsion. An electric vehicle may be powered through a collector system by electricity from off-vehicle sources, or may be self-contained with a battery, solar panels or an electric generator to convert fuel to electricity. Electric vehicle technicians service and repair electric and hybrid-electric cars, or vehicles that run on both gasoline and electricity. This job involves diagnosing, maintaining, and repairing these vehicles.

## **EVT Workshop**

he electric vehicle technician workshop is an initiative taken by the electrical department of LDCE to train the students to work on electric vehicle production, repair and maintenance. The 40 hour workshop program covers a number of comprehensive topics through lectures and practical in advanced electric car theory and practice. Topics include-

- 1. Who is an EVT?
- 2. All about the existing scenario of electric (2 wheeler) vehicle- its construction, maintenance and repair.
- 3. Information on the charging stations and discussions on ways to improve efficiency of electric vehicles.

On successful completion of these courses, the students will be awarded with a certificate after passing a test on the topics covered in the workshop.

# Kaizen 2018 Applications of Solar



#### Team:

1)Krupali Hakani 3)Manan Patel 2)Namrata Motiramani 4)Ashit vaghela

#### **About Project**

he team has prototyped a portable Solar Cooler and a Solar Heater which can be used for multiple purposes. It is viable for small scale cooling and heating in industries as well as economical for domestic as it uses solar energy directly and reduces the overall electricity consumption. It is user-friendly and environment friendly. The idea of solar cooler got recognition at national level and it won the first prize at IIT, Roorkee -2017.

### **Advantages:**

- This does not require evaporative chemicals, CFC (Chloro-Fluoro Carbon) which may be harmful to the environment.
- Long life with MTBF(mean time between failures) of around 1,00,000 hours.
- There is no need of compressor, evaporator or condenser.
- No moving parts in this module. So, maintenance is less.
- Mostly cooling and heating is needed during day time and the solar cell works best during a
  day.
- The temperature control is easy by changing the input current and temperature of the hot side
- Portable, lightweight assembly with negligible running cost.
- Works on DC supply so eliminates the need of inverter.
- Cooling is insensitive to motion or tilting.



# "uş raat"

आज फिर सूरज आया है, साँझ के अँधेरे को ढँकने, फिर क्यूँ लगता है बार बार मेरा हालात मुझपे हँसने। कुछ दरिंदोने नोचा मुझे,मैं चीखती रही चिल्लाती रही, 'उस रात' के भयानक सपने को भूलने हर रात मैं जागती रही।

'दीये' तो जले मेरे लिए,लेकिन उसमे 'राख' इंसानियत हो गयी, क्या गुनाह था मेरा जो मुझे देख हर नज़रे नीचे झुक गयी। गुनाह मेरा नही तो सज़ा मुझे क्यूँ? 'उस रात' के बाद हर सवाल मुझसे क्यूँ?

मुझे देख एक माँ ने बेटी से बोला अपने कपड़ो का ख्याल रखना। ना बोला अपने बेटे को 'लड़के' होने का ध्यान रखना। आज भी क्यूँ खड़ी ये सोच की दीवाल है? 'उस रात' के बाद भी समाज का क्यूँ ये हाल है?

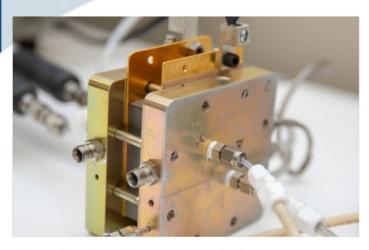
कुछ लड़को को मेरे 'लिए' खड़े देखा, तो पूछा एक सवाल, क्या मेरे 'साथ' कोई ज़िदगी बिताएगा? सन्नाटे ने दिया जवाब। आज पूरा देश बना मेरी आवाज़ है, लेकिन 'उस रात' के बाद क्या कोई बदल सकता मेरा 'आज' है?

क्या अपनी पहचान खो दि मैंने ? क्या जीने का हर हक़ खो दिया मैंने ? मैं ही नही ऐसी हज़ारो लड़कियाँ 'उस रात' से गुज़री है, एक नही हज़ारो राते 'उस रात' के न्याय में निकली है।

अब कानून ही नहीं सोच भी बदलनी होगी, हमें लड़िकयों को देखने का नज़रिया बदलना होगा, समाज में चल रही एक तरफ हवा बदलनी होगी, 'उस रात' के पीछे का हर कारण बदलना होगा।

~Shivani Pandey

## **IIINEWS**



#### New fuel cell concept brings biological design to better electricity generation

Date: October 3, 2018

Source: University of Wisconsin-Madison

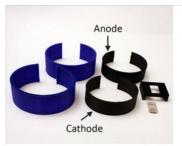
uel cells have long been viewed as a promising power source. But most fuel cells are too expensive, inefficient, or both. In a new approach, inspired by biology, a team has designed a fuel cell using cheaper materials and an organic compound that shuttles electrons and protons. The energy output of the new fuel cell design produces about 20 percent of what is possible in hydrogen fuel cells currently on the market, but the system is about 100 times more effective than biofuel cells that use related organic shuttles.



# New material, manufacturing process use sun's heat for cheaper renewable electricity

Date: October 18, 2018 Source: Purdue University

Scientists have developed a new material and manufacturing process that would make one way to use solar power -- as heat energy -- more efficient in generating electricity.



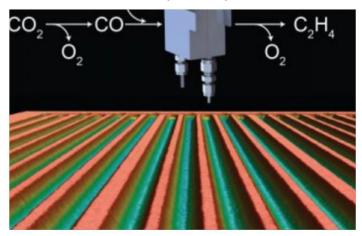


#### 3D-printed lithium-ion batteries

Date: October 17, 2018

Source: American Chemical Society

lectric vehicles and most electronic devices. such as cell phones and laptop computers, are powered by lithium-ion batteries. Until now, manufacturers have had to design their devices around the size and shape of commercially available batteries. But researchers have developed a new method to 3D print lithium-ion batteries in virtually any shape. To demonstrate the battery's potential, the team 3D printed an LED bangle bracelet with an integrated lithium-ion battery. The bangle battery could power a green LED for about 60 seconds. According to the researchers, the capacity of the first-generation 3D-printed battery is about two orders of magnitude lower than that of commercial batteries, which is too low for practical use. However, they say that they have several ideas for increasing the capacity, such as replacing the PLAbased materials with 3D-printable pastes.



# Efficient electrochemical cells for carbon dioxide conversion

Date: October 25, 2018 Source: Cell Press

cientists have developed electrochemical cells that convert carbon monoxide derived from carbon dioxide into commercially viable compounds more effectively and efficiently than existing technologies. Their research provides a new strategy for capturing carbon dioxide and converting it into chemical feedstocks.

# THE-Jetter

Today as I sit back and had a glance of my life, so far all I can recollect is the wonderful time I had when I was at my very own department "The Electrical Dept" of the prestigious institute "LDCE".

Now at the age of 24 when I have started working for a corporate company

[Which has no terminal leading to the outside world, called "virtually shorted"].

I feel what "STRESS" literally means.

This letter is not just a conjunction of words; it's an ocean of emotions, an everlasting river of memories. Memories of the most beautiful place I have been to, memories of the place which blessed me with the company of the most amazing people-the most learned teachers, most amazing friends, buddies, companions, My Constants!!

> Still in search of a permanent one Gmail address-trivedidharmik48@gmail.com

**ELECTRICAL DEPT LDCE** Ahmedabad-15

SUB:-

Dear Department,

I am fine and certain that you are in the same boat. Well this certainty is because of your peculiar habit of having a great connect with your students every passing year; you tend to make a fix, special place in the hearts of each one of us.

Well as it is rightly said, "the two most difficult things to say is "Hello" for the first time and "Goodbye" for the last time". Since the day I had said the last goodbye to you my heart has ran errands. I wonder how easy it was for each one of us to come and leave our "HUB", our "Dept" everyday .The place where we learnt to the fullest, shared our thoughts without the fear of being judged, laughed as if no one was watching, lived every moment .as it was the last one.

I thank the respected faculties as they effortlessly fed me with the inputs necessary to make self starting starter for my life or I wouldn't be wrong in saying that they made a smooth prototype for my healthy wealthy life. [IRONY-I understood the working of a starter much later"]

Dear department, how can you be so generous!! I doubt you even remember what a huge sum of the "Electrical **Loan**" you have owed to each one of us.

Yes, the Electrical Loan [sounds like circuits, ICs, boards n stuff right!!But alas you are wrong]

This loan hints towards our exclusive dept library where at any instant one could access any book, that too without a return policy!

Every time when I left the dept library I could feel a new Dharmik reborn within.

When I took admission in electrical branch, all I dreamt was me in a professional attire, repairing transformers. motors, generators in a lab with the lab assistant by my side, encouraging me to do research seeing my work. But then I woke up & went to the lab the very first day & realised why I was paying a mere amount of Rs 1500 per annum.

Jokes apart, I realised how lucky I was to have access to any machine available, in any lab at any time. [Fact-"Better late than never", Confession!!- realised this at the end of 3<sup>rd</sup> year]

#### The Classrooms!!

These mighty rooms were marginally stable because the curve between the location of lecture & related classroom was non linear.

But yes, I admit I loved my classrooms because these were the places from where the content of my much appreciated stand ups took birth!!

Dear department you have made 2 entrances for your dear students but you know what we always loved to exit through our neighbour dept, the Computer dept.

#### [Shhh...Secret Revealing Alert!!

The reason why we took that path was because we had our place of opportunities out there!! (the PWD building)

Guess it vaar....Computer dept on one side, IT on the other & rabdi at the back!

[Danger Alert-Awful staffroom of faculties out there amidst these opportunities]

The importance of the 2<sup>nd</sup> floor of Pwd building was experienced only by few & I feel blessed that I was one of them. This floor was where we practised for the cultural club of Ldce"Dhanak".

The practices, the planning, the management meetings all are missed!!!

How can I forget the only AC room of our dept!!

The **Chanakya Hall**, ahh what a gala time we had in the 3<sup>rd</sup> sem!! All the 3 divisions had combined classes due to renovation!![Believe me 3<sup>rd</sup> sem mein attendance bhi max this aur neend bi puri thi!!]

In short our dept was truly electrically grounded!!It was our very own place!!the place where we made attempts, some turned a success while many were failures, but you dear dept gave us the courage of making those mistakes, realise them, correct them and hence emerge as a better version of oneself.

Now when I see the reality, I witness a completely changed environment, an environment full of expectations. targets, deadlines & competition.

But yes as we know

"The system will take time to be stable when sudden changes are applied!! & that is called stable system" I know I will too eventually obtain my stable system i.e. no poles on right side of y axis.

But what about the ocean of memories of my dept, the cherishable moments with my people which I wish to relive.

This is the question I put forward to you to ponder upon .Do reply if by chance you get an appropriate answer for the same.

Always your student



# वक़्त

वक़्त से अपनाया था वक़्त पे ठुकराओगे, पास नही आना तो दूर जाके भी क्या पाओगे, रहोगे साथ दो पल जब तक खुश हो, फ़िर न जाने किस बीच राह पर छोड जाओगे, बंदिशो में दुनिया की रहकर मुझे खुद से दूर कर जाओगे, वादा है मेरा कहीं हज़ारो की भीड़ में भी मेरे बिन खुद को तन्हा पाओगे, रिश्ता बनाया था एक वक़्त पे जिन जरुरतों की ख़ातिर, जानता हूँ उस रिश्ते को कुछ वक़्त तक ही निभा पाओगे, आज जो कह रहे हो हर वक़्त हर जगह खुद को मेरा हमसफर तुम, कहीं यू ही मेरे सफर पर मुझे तन्हा छोड़ जाओगे, कभी वक्त मिले तो वक्त पर याद कर लेना हमें. यूँ बेवक़्त याद आके हमें कब तक तडपाओगे, जहाँ दुनिया की रंजिशो से जब हार कर आस छोड़ जाओगे, बेशक उस वक़्त में तुम हमे अपने पास पाओगे, साथ दीया था तुने एक वक़्त तक मेरा, पर यकीन कर के देखो उस वक़्त जब ये सांस छोड जाओगे, उस कब्र में भी तुम हमें अपने पास पाओगे, वक़्त से अपनाया था वक़्त पे ठुकराओगे, पर एक वक़्त तु हर वक़्त मेरे पास रह जाओगे...



# Herd Mentality

As a man was passing by the forest one evening he caught hold a very strange scene around. What he saw was something hard to believe if not seen. The mighty Elephants were held by only a small rope tied to their front leg, which obviously they could break away any time but for some unknown reason they didn't.

When the traveller was wandering around and was wondering about the rare scene he witnessed he saw a trainer nearby and approached him to ask why these huge creatures just stood there and made no attempt to get

Well, the trainer said it's all about mentality sir ".The man was still confused so he asked the trainer to elaborate.

The trainer responded "When these creatures were young enough we used the same size rope to tie them, as at that age, it was sufficient to hold them back. As they grew up, they conditioned themselves to believe that they cannot break the rope and run away and so not a single one of them tried to break the rope and set themselves free."

The man was amazed, but learnt something very weird yet true about the

The man was amazed, but learnt something very weird yet true about the mentality. Every single step that we take is influenced by others. We choose the road most travelled by people just because of this prominent 4 letter word "FEAR" - the fear of Failure, fear of Embarrassment, fear of standing Alone, fear of Rejection. But truly what one needs to fear is "fear" itself.

Live your life, live your dreams. Your efforts, your struggle, your hard work, will all be worth the risk you take to open up yourself. So wake up, buck up, inhale the air of passion. Start your journey. Grab your dreams. Enjoy your mistakes. Dance to the rhythm of your heartbeats.

SMILE.LAUGH & LIVE!!



# એ જ મારે મન મોટી વાત હતી...

ભીડમાંથી ઉભરવાની મહત્વાકંક્ષા એ સૌથી નિરાળી વાત હતી... સપના જોવા ની હિંમત એ જ મારે મન મોટી વાત હતી...

દાર કે જીત એ તો પછીની વાત દતી... પણ એક પ્રામાણિક પ્રયત્ન એ જ મારે મન મોટી વાત દતી...

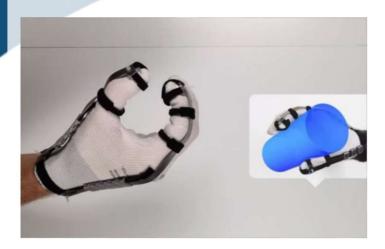
આ કપરી સફરની તો સૌને જાણ હતી... પણ એક ડગ ભરવાનું સાહસ જ મારે મન મોટી વાત હતી...

નાના મોટા વિઘ્નની ઝલકતો મનમાં સાફ હતી... પણ "લડીલઈશ" એવો જુસ્સો જ મારે મન મોટી વાત હતી...

"સફળતા સાથે આલિંગન" એ ચાદગાર પળ હતી… પણ નિષ્ફળતાના પાઠ એ જ મારે મન મોટી વાત હતી…



## **IIINEWS**

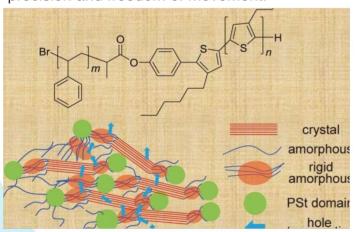


# Ultra-light gloves let users 'touch' virtual objects

Date:October 15, 2018

Source: Ecole Polytechnique Fédérale de Lausanne

Scientists have developed an ultra-light glove -- weighing less than 8 grams per finger -- that enables users to feel and manipulate virtual objects. Their system provides extremely realistic haptic feedback and could run on a battery, allowing for unparalleled freedom of movement. The glove is able to generate up to 40 Newtons of holding force on each finger with just 200 Volts and only a few milliWatts of power. It also has the potential to run on a very small battery. That, together with the glove's low form factor (only 2 mm thick), translates into an unprecedented level of precision and freedom of movement.



# Electrical enhancement: Engineers speed up electrons in semiconductors

Date: October 17, 2018

Source: Tokyo University of Agriculture and Technology

esearchers have sped up the movement of electrons in organic semiconductor films by two to three orders of magnitude. The speedier

electronics could lead to improved solar power and transistor use across the world, according to the scientists.



# Building a better battery layer by layer

Date: October 12, 2018 Source: Shinshu University

cientists are now closer to a thin, high-capacity lithium-ion battery that could open the gates to better energy storage systems for electric vehicles.Lithium-ion batteries store a lot of energy, but the force it takes to make the battery disperse the energy is too much -- so much, in fact, that the resulting damage makes the battery lose storage capacity. "We discovered... that coating the surface of the active material with a self-assembled monolayer... promoted efficient transportation within the electrodes. while also suppressing the side reactions occurring at the electrode and electrolyte interface," Zettsu said. "This coating provided improvement in both the power density and the cyclability in high-voltage lithium-ion batteries." The researchers saw that the direct contact between the cathode and the electrolyte entering the battery was minimized, and that the capacity of the battery did not degrade even after it was cycled one hundred times



# ELECTRIQUIZ

- 1. Who was the 1<sup>st</sup> Electrical Engineer?
- 2. Which is the World's Smallest Mobile?
- 3. Who invented the 1st resistor and when?
- 4. Where is the 1<sup>st</sup> Electric power transmission line in the World installed?
- 5. Which is the longest power transmission line in World?
- 6. Which is the longest power transmission line In India?
- 7. Who invented the 1<sup>st</sup> electrically powered ceiling fan and when?
- 8. Who developed the 1<sup>st</sup> incandescent light and when?
- 9. Who discovered the Integrated Circuits & Chips?
- 10. Who invented the 1<sup>st</sup> capacitor and what was its name?

10. Ewald G. Von Kleist, name-Leyden Jar (on November 4, 1745)

9. lack Kilby & Robert Noyce

8. Humphry Davy in 1802

7. Philip Diehl in 1882

6. Talcher-Kolar transmission link (1450 km long, 5th longest in the World)

5. The Rio Madeira transmission link in Brazil (overhead length of 2,385 km)

4. North America (June 3, 1889)

3. Ofis Frank Boykin, (June 16, 1959)

2. Zanco tiny T1

1. Francis Ronalds

**Answers:** 



WHAT WE CALL THE
BEGINNING IS OFTEN THE
END. AND TO MAKE AN END
IS TO MAKE A BEGINNING.
THE END IS WHERE WE
START FROM.



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