

# The Zenith

*Volume 1*

*Year - 2018*

“The Zenith” is a Technical newsletter of Electronics and Telecommunication Department. The objective of newsletter is to make students aware about current technologies in an industry. The volume 1 also includes details of expert talk, industrial visits, workshops, student placement, conference, industrial training and various activities under entrepreneurship development cell and career development cell organized in the department. The information regarding placement and research papers is also provided for readers.

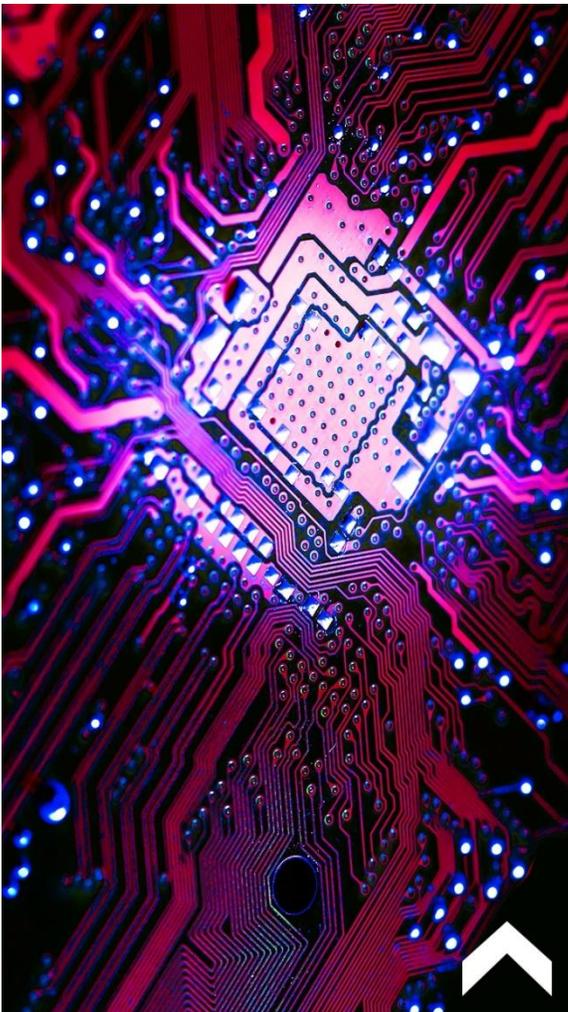


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# The Zenith

*January 01, 2018*  
*Volume 1, Issue 1*



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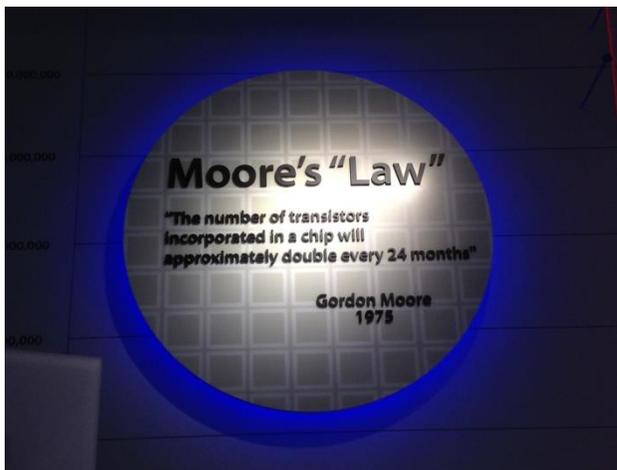
## Walmart News

The fear of robots taking jobs from people is nothing new, but now and then it rears its head anew. This past month, Walmart announced plans to begin using robots that roll through the aisles to perform tasks like scanning the shelves for items that are out of stock or mislabeled.

Walmart has assured worried employees that the robots won't be replacing humans – they claim they're just to make human jobs

more efficient. But if there's less to do, it just makes sense that fewer people will be needed. This is only one small move in the direction of human work being handed over to robots, but it is a move in that direction nonetheless.

*Source: [www.hostgator.com](http://www.hostgator.com)*



## Moore's Law Still Refuses to Call it Quits

The end of CMOS scaling has been expected for quite some time, but the engine that is Moore's Law refuses to call it quits. There's an obvious reason for scaling to stop: the Laws of Physics – a brick wall of substantial construction. Yet the industry continues to push towards it, even though the rate of progress has slowed somewhat.

TSMC gave some insight into the future during its latest investor meeting. Co CEO Mark Liu said

that now its 7nm process technology was ready for production, most of the team that developed the process were now working on 3nm technology. "We also have a big pathfinding team," he added, "developing technology to see if we can go beyond that."

*Source: [Graham Pitcher](http://Graham Pitcher)  
[Newelectronics.uk](http://Newelectronics.uk)*

## Enabling Robust Data Communications within a High Voltage BMS

The primary purpose of the battery management system (BMS) is achieving reliability, performance and longevity of battery packs. As part of this, the battery management electronics measures each cell voltage and transmits this information to a central processor. For high voltage battery strings – such as is typical for automotive drivetrains – a modular distributed pack is an attractive choice. Battery modules can serve as the basic building block for multiple pack designs. Modules also allow for optimal weight distribution and maximum use of available space. The biggest challenge is the datalink required to operate the pack as a single unit.

An electrically noisy environment, such as within automobiles, is a big challenge for data communication links. Although a CANbus link, combined with isolation, can provide sufficient noise-rejection, it is a complex, costly solution. For this reason, Linear Technology developed isoSPI, a two-wire adaptation of the standard Serial Peripheral Interface (SPI).

## Robotics and AI...

**“...could help to boost productivity down on the farm when EU subsidies end”**



The continuing Brexit negotiations have yet to bring certainty to any industries. While New Electronics has already highlighted the concerns of the scientific research community, another group is waiting anxiously for progress.

That group is the UK's farmers. Currently, the UK's agriculture sector receives some £3billion a year in EU subsidies. That money will stop when the UK leaves the EU. While the Government has said it will match that funding, it will only do so until 2022. What happens after that is open to conjecture, but the suggestion is that just as

Clark said the £90m funding will make the Government's Transforming Food Production Challenge a reality and enable the creation of 'Translation Hubs', helping to apply the latest research to farming practice.

Is it also a coincidence that the announcement should fall back on robotics and AI – currently the two 'go to' phrases for politicians who want to look on the ball?

The potential for both technologies is huge, but each carries with it a significant downside. In the case of robotics, the downside is the perception that the technology is taking

industry has been urged to boost its productivity, so too should farmers.

There's little chance that farmers will be left to their own devices, though. The sector contributes more than £14billion a year to the UK's economy and supports some 500,000 jobs, so the political consequences would be fairly unpleasant.

Is it more than a coincidence that at the recent National Farmers Union conference, industry secretary Greg Clark announced a £90million investment in robotics, AI and earth observation technologies.

people's jobs away from them. The downside of AI is that it might actually be too clever for its – and our – good.

Robotics will have a place in the industry of tomorrow – whatever the sector – but it won't be to the exclusion of humans. While some captains of industry will see the opportunity to replace workers with automation, others see collaborative robots – or cobots – as having the potential to augment our abilities.

*Source: Graham Pitcher  
Newelectronics.uk*

## Expert Lecture/Seminars/Courses/Industrial Visits Organized

- Expert talk on "Soft skills and communication basics" was conducted by Dr. Medha Saykhedkar on 27<sup>th</sup> December 2017.
- A presentation on "Improving Employability of Our Students in association with Siemens, Nashik was conducted by Mr. Sachin Bhanushali and Mr. Madhukar Dubey on 18<sup>th</sup> December 2017.
- Industrial visit to Balaji powertronics (MICROTEK) at Parwanoo, Himachal Pradesh was organized for TE & BE students on 18<sup>th</sup> December 2017.



## Papers in National/International in Journals/Conference

Prof. Dr. Manisha P. Satone presented paper on "KKWETC" Indian Face Database in International Journal of Engineering Trends and Technology (IJETT) – Volume 54 on 1<sup>st</sup> December 2017.

### **Abstract:**

*To test face recognition algorithm developed by researchers, it is needed to have proper database. This paper describes an Indian face database 'KKWETC' of visual and thermal static images of human faces. Images were taken in uncontrolled indoor environment. Database contains 816 static visible images of 68 subjects and 150 thermal images of 50 subjects. A baseline Principal Component Analysis (PCA) face recognition algorithm was tested on both databases. Researchers can use these databases to test algorithm and compare results. Database is available to research community through the procedure described at [http://engg.kkwagh.edu.in/media/post\\_image/database\\_info\\_website.pdf](http://engg.kkwagh.edu.in/media/post_image/database_info_website.pdf).*

**Keywords:** Face recognition, database, thermal images.

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## **Vision**

Provide quality education to create engineering professionals of global standards by keeping pace with rapidly changing technologies to serve the society.

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M1: To educate the students with the state-of-the-art technologies and value based education to meet the growing challenges of industry.

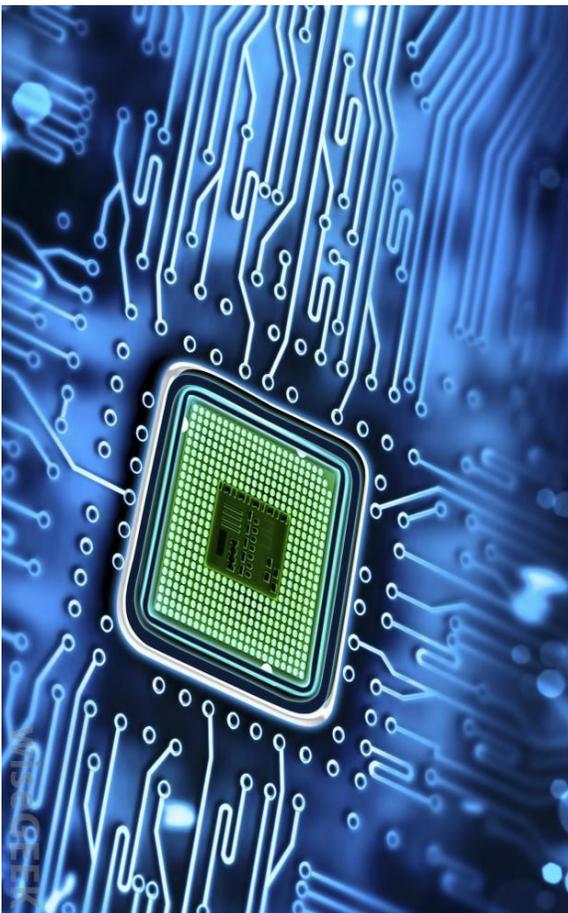
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M3: To inculcate awareness towards societal needs.

# The Zenith

*March 01, 2018*

*Volume 1, Issue 2*



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# Prediction for the design industry in 2018

**1. Smart Metering:** An adjustment to the Smart meter roll-out. It is looking unlikely that the SMETS2 rollout, which is the installation of smart meters that can be switched between utility providers, will be met as planned by 2020 – there has simply been too little done so far and there is a groundswell of opposition. Something has to give.

**2. Smart Home Systems:** IoT will become even more inclusive, with new and existing products integrating into smart home systems such as Google Home, Amazon Alexa and Apple Homekit. As well as exposing APIs to give other developers the ability to use more open technologies, for example Samsung Smart things, IFTTT and Deutsche Telekom's QIVICON. Instead of having a myriad of standalone IoT home devices – each with their own proprietary communications protocol – we anticipate the growth of a more cohesive, standardized approach in this space using the above technologies.

**3. Bluetooth:** Bluetooth 5 and Bluetooth Mesh are separate technologies but both have been recently approved by the Bluetooth SIG. Expect to see a rapid increase in the number of Bluetooth 5 devices over the next year. Advantages are meshing ability, increased data rate or range and an increase in advertising capacity. The addition of meshing in particular is interesting in relation to the impact this could have on Thread and ZigBee. For end users, this should remove one of the bigger flaws in Bluetooth; its limited range.

**4. Constricted Component Supply:** Problems with manufacturing of electronics due to constricted component supply. Standard lead times have gone out as lots of parts are on allocation (with buyers allocated limited quantity from suppliers) due to continuing growth in markets, including mobile and automotive, pushing up component demand. Semiconductor mergers and acquisitions have also had an impact on availability, and memory prices have rocketed. This will cause problems for everyone but the tier one companies, who are limiting their exposure to supply issues by swallowing the stock.

**5. Automotive Communication:** Standards will develop for self-driving vehicles to adapt driving styles and routes based on shared information. Together with this, we expect growth in the automotive semiconductor sector - occupied by giants including NXP Semiconductor, Renesas Electronics and Osram - as the insatiable demand for infotainment from drivers shows little sign of abating.

Author  
Dunstan Power

# Another achievement for EUV

I asked in January, with a degree of uncertainty, whether EUV lithography had finally come of age. I based the question on a number of developments that, together, pointed to EUV making it into mainstream semiconductor production in the next year or so.

Now, another affirmation of EUV's worth has come from a joint announcement by Samsung Electronics and Qualcomm that the latter's Snapdragon 5G chipsets will be made on Samsung's 7nm LPP process, of which EUV plays a part. According to the foundry, it has run more than 200,000 test wafers using EUV, with yields of 256Mbit memories – the test chips – reaching 80%.

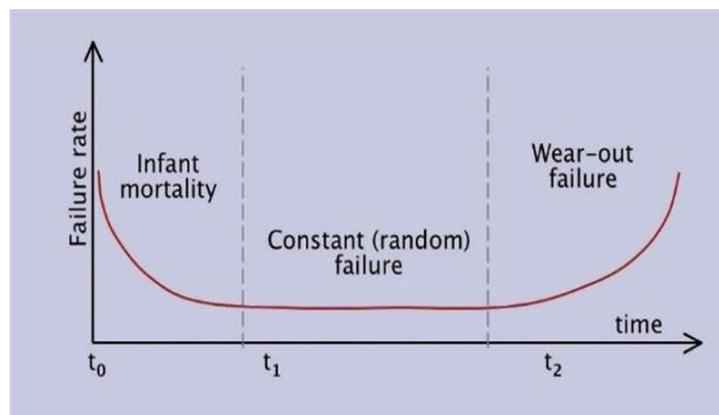
7LPP – apparently the first process at Samsung to use EUV – could enter production later this year, but how much of the lithography process relies upon EUV remains to be seen. Samsung claims 7LPP has fewer process steps than are used in its 10nm FinFET process, which suggests EUV is making a contribution.

*Source: Graham Pitcher*

*Newelectronics.uk*

# How to Improve Power MTBF & Reliability

Power supply reliability is important - no one wants their production line, measurement instrument, communications system or electronic product to stop working prematurely due to a failure. How is reliability defined, what methods can designers use to improve reliability and how do you ensure that a selected product will meet expectations?



Author  
TDK-Lambda UK

## Expert Lecture/Seminars/Courses/Industrial Visits Organized

- A Seminar on "Avionics Navigation" was conducted by Mr. K. Shankar Narayan, HAL on 2nd February 2018.
- Workshop on "Web designing and mobile app development " was conducted by Mr. Ajay Avadh, Senior software developer, Snapwork Technologies on 17th & 18th February 2018.
- A Seminar on "Applications of control systems in Indian Railways" was conducted by Mr. V. N. Bodade on 17th February 2018.
- A Seminar on "Group Discussion" was conducted by Dr. Shalmali Gadge, MBA dept., KKWIEER on 20th February 2018.
- Industrial visit to Caprihans India Limited, Satpur, Nashik was organized for TE students on 22nd February 2018.
- Industrial visit to ISRO at Bangalore, Karnataka was organized for SE students on 23<sup>rd</sup> February 2018.



## Campus Placement

Sr. No.	Name of the Company	No. of students Placed
1.	TCS	5
2.	Qspider	6

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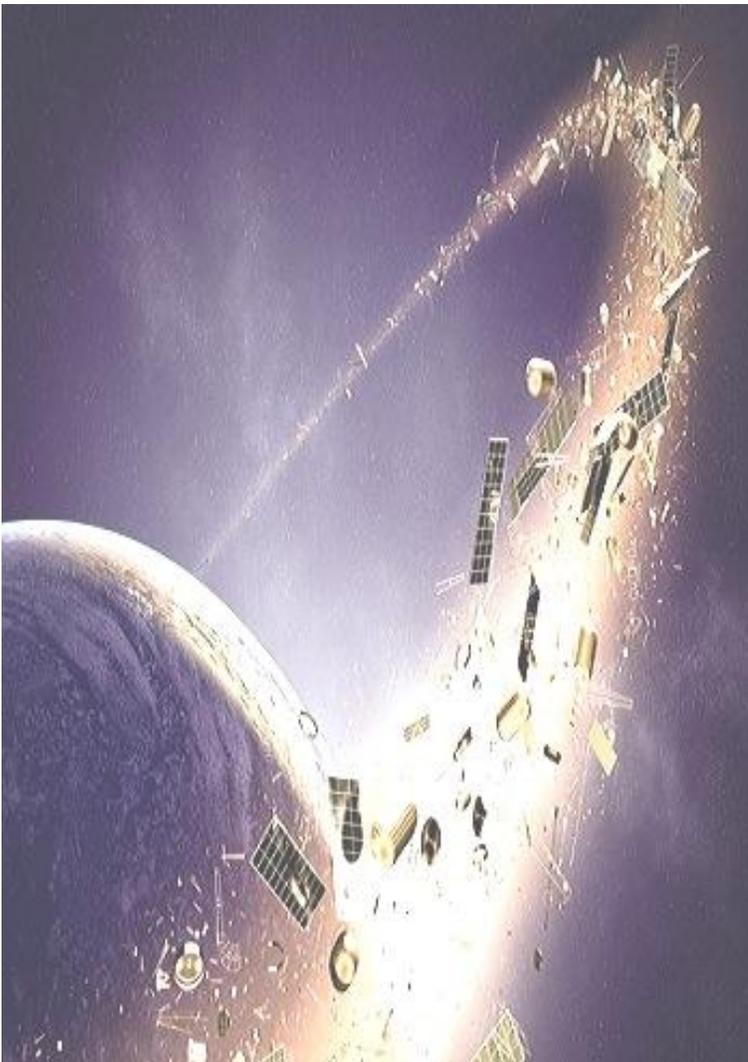
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# The Zenith

*May 01, 2018*

*Volume 1, Issue 3*



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# Space junk: The cluttered frontier

Hundreds of millions of pieces of space junk orbit the Earth daily, from chips of old rocket paint, to shards of solar panels, and entire dead satellites. This cloud of high-tech detritus whirls around the planet at about 17,500 miles per hour. At these speeds, even trash as small as a pebble can torpedo a passing spacecraft.

NASA and the U.S. Department of Defense are using ground-based telescopes and laser radars (ladars) to track more than 17,000 orbital debris objects to help prevent collisions with operating missions. Such ladars shine high-powered lasers at target objects, measuring the time it takes for the laser pulse to return to Earth, to pinpoint debris in the sky.

Now aerospace engineers from MIT have developed a laser sensing technique that can decipher not only where but what kind of space junk may be passing overhead. For example, the technique, called laser polarimetry, may be used to discern whether a piece of debris is bare metal or covered with paint. The difference, the engineers say, could help determine an object's mass, momentum, and potential for destruction.

"In space, things just tend to break up over time, and there have been two major collisions over the last 10 years that have caused pretty significant spikes in debris," says Michael Pasqual, a former graduate student in MIT's Department of Aeronautics and Astronautics. "If you can figure out what a piece of debris is made of, you can know how heavy it is and how quickly it could deorbit over time or hit something else."

Kerri Cahoy, the Rockwell International Career Development Associate Professor of aeronautics and astronautics, and an associate professor in the Department of Earth, Atmospheric, and Planetary Sciences at MIT, says the technique can easily be implemented on existing groundbased systems that currently monitor orbital debris.

"[Government agencies] want to know where these chunks of debris are, so they can call the International Space Station and say, 'Big chunk of debris coming your way, fire your thrusters and move yourself up so you're clear,'" Cahoy says. "Mike came up with a way where, with a few modifications to the optics, they could use the same tools to get more information about what these materials are made of." Pasqual and Cahoy have published their results in the journal *IEEE Transactions on Aerospace and Electronic Systems*.

*This research was supported, in part, by the MIT Lincoln Scholars Program.*

# New technique allows analysis of clouds around exoplanets

Meteorologists sometimes struggle to accurately predict the weather here on Earth, but now we can find out how cloudy it is on planets outside our solar system, thanks to researchers at MIT.

In a paper to be published in the *Astrophysical Journal*, researchers in the Department of Earth, Atmospheric, and Planetary Sciences (EAPS) at MIT describe a technique that analyzes data from NASA's Kepler space observatory to determine the types of clouds on planets that orbit other stars, known as exoplanets. The team, led by Kerri Cahoy, an assistant professor of aeronautics and astronautics at MIT, has already used the method to determine the properties of clouds on the exoplanet Kepler-7b. The planet is known as a "hot Jupiter," as temperatures in its atmosphere hover at around 1,700 kelvins.

NASA's Kepler spacecraft was designed to search for Earth-like planets orbiting other stars. It was pointed at a fixed patch of space, constantly monitoring the brightness of 145,000 stars. An orbiting exoplanet crossing in front of one of these stars causes a temporary dimming of this brightness, allowing researchers to detect its presence.

Researchers have previously shown that by studying the variations in the amount of light coming from these star systems as a planet transits, or crosses in front or behind them, they can detect the presence of clouds in that planet's atmosphere. That is because particles within the clouds will scatter different wavelengths of light. Modeling cloud formation

To find out if this data could be used to determine the composition of these clouds, the MIT researchers studied the light signal from Kepler-7b. They used models of the temperature and pressure of the planet's atmosphere to determine how different types of clouds would form within it, says lead author Matthew Webber, a graduate student in Cahoy's group at MIT.

"We then used those cloud models to determine how light would reflect off the atmosphere of the planet [for each type of cloud], and tried to match these possibilities to the actual observations from the Kepler mission itself," Webber says. "So we ran a large set of models, to see which models fit best statistically to the observations."

By working backward in this way, they were able to match the Kepler spacecraft data to a type of cloud made out of vaporized silicates and magnesium. The extremely high temperatures in the Kepler-7b atmosphere mean that some minerals that commonly exist as rocks on Earth's surface instead exist as vapors high up in the planet's atmosphere. These mineral vapors form small cloud particles as they cool and condense.

Kepler-7b is a tidally locked planet, meaning it always shows the same face to its star — just as the moon does to Earth. As a result, around half of the planet's day side — that which constantly faces the star — is covered by these magnesium silicate clouds, the team found.

"We are really doing nothing more complicated than putting a telescope into space and staring at a star with a camera," Cahoy says. "Then we can use what we know about the universe, in terms of temperatures and pressures, how things mix, how they stratify in an atmosphere, to try to figure out what mix of things would be causing the observations that we're seeing from these very basic instruments," she says.

*Helen Knight | MIT News correspondent*

## Expert Lecture/Seminars/Courses/Industrial Visits Organized

- State level workshop on "Hands on Training in VLSI Design and Verification" was conducted by Mr. Shrikant Atkarne from NI Logic, Pvt ,Ltd, Pune and Mr Mayur Deshmukh from CoreEL Technology, Pune on 5<sup>th</sup> March to 7<sup>th</sup> march 2018.
- A seminar on "Technology advancements - Bring autonomy further into reality" was conducted by Mr.Prasanna Deshpande and Mr.Amit Doshi,senior application engineer, MathWorks on 16<sup>th</sup> March 2018.



- A seminar on "Product Development Cycle in industry" was conducted by Mr.Uday Karlekar, Chief faculty, Technocrafts on 24<sup>th</sup> March 2018.
- A seminar on "Wireless Networks" was conducted by Dr.R.S.Tiwari, Director, Cognifront on 28<sup>th</sup> March 2018.
- Expert Lecture on "Interview skills and Resume writing" was conducted by Mr. Vishal Jategaokar on 28<sup>th</sup> March 2018.

- Industrial visit to MyFM, Nashik was organized for SE students on 27<sup>th</sup> March 2018.



- Industrial Visit to Signaling Department, Nashik Road (NK) Railway Station for SE students on 4<sup>th</sup> April 2018.



- Industrial Visit to DEN Cable Network for BE students on 5<sup>th</sup> April 2018.



## Campus Placement

Sr. No.	Name of the Company	No. of students Placed
1.	CMS info Solutions	8
2.	Ramkrishna IT	4
3.	Shriram Transport Finance Company Ltd.	1

## National Conference on Recent explorations & Advancements in Technology and Engineering (NCREATE-2018)

A one day National Conference on Recent explorations & Advancements in Technology and Engineering (NCREATE 2018) was held at department of Electronic and Communications Engineering of KKWIEE&R, Nashik, Maharashtra on 16<sup>th</sup> March 2018.



[NCREATE-2018 Decoration in the E & TC Department]

The objective of the conference was to provide a common platform for researchers, engineers and scientists to share their innovative ideas and original research and to motivate them. The conference was inaugurated by the chief guests Mr. Amit Doshi, senior application engineer, Mathworks and Mr. Prasanna Deshpande, Head, Control Design Application Engineering team, Mathworks.



[Inauguration function of NCREATE-2018]

Prof. Dr. D. M. Chandwadkar, Head of E & TC department welcomed all guests, participants, all other staff members and students. He emphasized on need of updation of knowledge by Engineers for their personal growth & for the growth of the country. In this era of interdisciplinary culture science & Engineering streams should be linked to create more real time applications. He also extended his heartfelt gratitude to all the resource persons, participating researchers, students and organizers for making this attempt of holding national conference. In the inaugural session, chief guests Mr. Amit Doshi and Mr. Prasanna Deshpande urged to create awareness among the upcoming student community and researchers by showcasing the potential of innovative trends.



[Inauguration function of NCREATE-2018]

Prof. Rupali V. Chothe, Assistant Professor, E & TC Department and Prof. Swanand S. Dongare, Assistant Professor, E & TC Department were organizers of the national conference. Dr. S. S. Morade, Professor, E&TC Department, Dr. M. R. Admane (Satone), Professor, E&TC Department, Mrs. S. P. Munot (Bhabad), Associate Professor, E&TC Department, Dr. S. A. Patil (Ugale), Associate Professor, E&TC Department and all other staff members of E & TC department were prominently present in the conference. All the participants were provided conference kits which include the document folder, writing pad, pen, conference schedule along with a lunch coupons. Finally, Dr. D. M. Chandwadkar announced the event open.

Mr. Amit Doshi, senior application engineer, Mathworks delivered the keynote address of the conference on “Technology advancements - Bring autonomy further into reality”.



[Keynote Address by Mr. Amit Doshi, senior application engineer,

Mathworks on “Technology advancements - Bring autonomy further into reality”]

The papers from all Engineering branches were invited and presented during the conference. Participation categories were Diploma students, Undergraduate and Post graduate students, Faculty members and research scholars.



[Technical session on “Simulation and Control of Multi-domain Systems Using MATLAB and Simulink” by Mr. Prasanna Deshpande, Head, Control Design Application Engineering team, Mathworks]

Total papers were divided in two tracks: Hard branches and soft branches. Separate technical sessions were organized during the conference. The technical session on “Use Big data and machine learning to solve real world problems” by Mr. Amit Doshi for soft branches and “Simulation and Control of Multi-domain Systems Using MATLAB and Simulink” by Mr. Prasanna Deshpande for hard branches were much appreciated.



[Prize distribution ceremony of NCREATE-2018]

The conference received the huge response from Diploma/UG/PG/Ph.D. students and staff members from many colleges across India. The conference was attended by more than 130 participants and 300 attendees. Total of 42 technical papers on various topics supported by recent

innovative trends in engineering Technology were presented by the authors. Many participants also presented their papers through skype.

Best papers were awarded in prize distribution ceremony of the conference. Selected papers will be published in IJCA journal.

## TELEKINESIS 2K18

Department of Electronics and Telecommunication Engineering had organized State level Symposium “TELEKINESIS 2K18”, during 21st and 22nd March 2018. Event’s Chief Guests were Mr.Nitin Mahajan, General Manager, BSNL, Nashik and Mr. Pradeep Shenoy, Senior Divisional Manager, LIC, Nashik. In the event various competitions were organized like Project Competition, Recruitment Spark, Poster Competition, Circuit Building, Technical Quiz Competition, C-Programming, etc. under **TELEKINESIS 2K18**. As a result for the event we have received overwhelming response of 700+ participants from various Places across Maharashtra like Pune, Nashik, Jalgaon, Dhule, Chandwad, and Ahmednagar. Eminent Judges from various Industries and Colleges judged competition and many sponsors like Shivananda electronics pvt ltd - Nashik, LIC- Nashik, Shree Ganesh Enterprises- Nashik, JMJ Machine tools-Nashik, GATI-Jalgaon, TIMES- Nashik, etc.assisted **TELEKINESIS 2K18**.

First copy of Departmental magazine was also released in the inaugural function of Telekinesis 2K18 by Chief Guests and Dr. D.M. Chandwadkar, HOD E&TC/ELTX.



Inauguration function of Telekinesis 2K18



Dr. D. M. Chandwadkar felicitating Chief Guests Mr. Nitin Mahajan and Mr. Pradeep Shenoy



At Project Competition Participants from Sandip Foundation College are explaining their Project



Departmental Magazine first copy released in the inaugural function of Telekinesis 2K18

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July 01, 2018

Volume 1, Issue 4



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# Sustainable Healthcare

Health, social care and medical research are all witnessing profound change at the hands of technology. Could digitalized healthcare help to transform the provision of services?

With the National Health turning 70 in July it will provide an opportunity to celebrate one of the most enduring institutions to have been created by the UK since 1945, but it is also likely to highlight growing concerns that an increasing number of key services are being overwhelmed in the face of rising demand from an ageing population.

Wearable technology could provide a vital component in solving many of these problems, reducing the demands on family doctors and other primary care providers. Wearable technology has the potential to reduce hospital admissions and bed stays and could end up being placed right at the front of the patient 'pathway' into the NHS.

*Source: Neil Tyler  
([www.newelectronics.co.uk](http://www.newelectronics.co.uk))*

## Robotics and AI

Beyond the use of data, many technologists are focused on the role of robots and artificial intelligence (AI) in providing key services in the NHS. Could we see robots being deployed to help patients eat their meals, or diagnose a serious illness or help patients recovering from operations?

In a new report looking at the possible impact of AI on the NHS, it was suggested that machines could take over a wide range of tasks currently done by doctors, nurses, healthcare assistants and administrative staff. "Given the scale of productivity savings required in health and care - and the shortage of frontline staff - automation presents a significant opportunity to improve both the efficiency and the quality of care in the NHS," said the report from the Institute for Public Policy Research (IPPR).

The report stipulated that widespread adoption of AI and the NHS embracing "full automation" could free up as much as £12.5bn worth of staff time for them to spend interacting with patients each year.

The challenge for health providers is to ensure that new opportunities can be grasped, that NHS staff have the right digital skills and the right technology is in place to improve care.

More than a third (36%) said that they would have no issue with a robot carrying out minor, non-invasive surgery on them, while 26% said that they would be happy for a robot carrying out major, invasive procedures.



# AI Spies Could Change Nuclear Politics

Two recent developments surrounding AI and geopolitics point to seismic shifts on the horizon. Facial recognition is making it more difficult for human assets to remain under the radar in foreign missions for the U.S. CIA. As a result, the agency is delegating more responsibility to AI and creating more AI-focused agents.

Second, the RAND Corp. has proposed that AI will be able to monitor an adversary's nuclear infrastructure and military, identifying more vulnerability in ways that human analysts can't. This could give one nuclear power a major advantage over another, breaking the mutually-assured destruction doctrine that has guided the world for decades. While separate developments, they are connected by a singular theme: AI surveillance and any advantage this could give to countries.

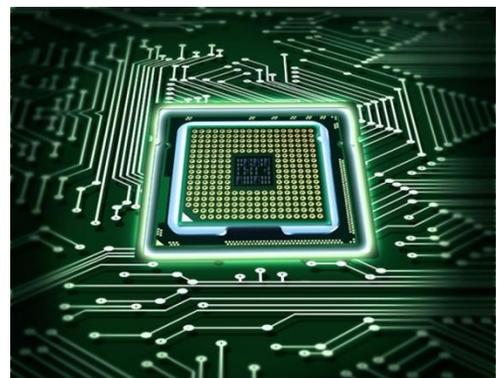
Source: [www.roboticsbusinessreview.com](http://www.roboticsbusinessreview.com)

## Cadence System Design Enablement

Sophisticated SoC, packaging, and board design tools. Over the years, we have extended our expertise and portfolio into the system design space, delivering IP, hardware/software convergence platforms, software content, and services along with the foundational EDA tools. Taking a holistic design approach from an end-product viewpoint forms the basis of our System Design Enablement strategy. In the automotive realm, Cadence has been amassing a depth of knowledge and experience through years of working closely with customers to meet their challenges of designing and verifying automotive components, subsystems, and the entire system.

We work not just with automotive semiconductor suppliers, but also with Tier 1 vendors and OEMs to deepen our understanding of their requirements, obstacles, and opportunities. We strive to ensure that our solutions are relevant for each level of the supply chain. Our technologies and methodologies, including offerings from our ecosystem partners, make Cadence ideally suited to enable automotive designers to succeed with system integration, package, board, and chip design and verification challenges.

***“The cloud will fundamentally influence silicon design by giving semiconductor companies the ability to optimize their capital versus operational expenses for computing infrastructure.”***



## Expert Lecture/Seminars/Courses/Industrial Visits Organized

- A seminar on "Innovative Teaching Methods" was conducted by Prof. D. C. Shimpi, Prof. S. V. Shelke & Prof. S. V. Bhokare for faculty on 22nd June 2018.
- A seminar on "Innovative Teaching Learning Tools" was conducted by Prof. Dr. M. R. Admane & Prof. K. S. Navale for faculty on 22nd June 2018.
- Demonstration of "How to Use Active Presenter Tool" to faculty was conducted by Prof. K. S. Navale on 23rd June 2018.
- Presentation on "Blended Learning Tool" to faculty was conducted by Prof. Dr. S. A. Patil on 25th June 2018.
- Expert Lecture on "Selection of Final Year Projects" was conducted by Mr. Nikhil Jain, Siemens, Nashik fo BE students on 30th June 2018.

***Published By***

***Department of E&TC***

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***Hirabai Haridas Vidyanagari,***

***Amrutdham, Panchavati***

***Nashik-422003***

***Editor: Prof. Dipankar D. Khartad***

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## **Vision**

Provide quality education to create engineering professionals of global standards by keeping pace with rapidly changing technologies to serve the society.

## **Mission**

M1: To educate the students with the state-of-the-art technologies and value based education to meet the growing challenges of industry.

M2: To provide scholarly ambience & environment for creating competent professionals.

M3: To inculcate awareness towards societal needs.

# The Zenith

September 01, 2018

Volume 1, Issue 5



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# iPhone Xs

APPLE has got fan bois hot under the collar with the unveiling of the iPhone XS, iPhone XS Max and iPhone XR.

The iDevice trio had few surprises in store thanks to the huge number of leaks building up to Apple's launch event; the iPhone XS and XS Max pack 5.8in and 6.5in OLED screens, respectively, while the "low-end" XR features a 6.1in LCD 'Liquid Retina' screen.

All three models are the first to feature Apple's homegrown A12

Bionic CPU, the first commercially available 7nm processor, and all come adorned with the notched display that first debuted on last year's iPhone X.

Source: [www.apple.com](http://www.apple.com)



## A12 Bionic Chip

The Apple A12 Bionic is a 64-bit ARM-based system on a chip (SoC) designed by Apple Inc. It first appeared in the iPhone XS, XS Max and XR which were introduced on September 12, 2018. It has two high-performance cores which are claimed to be 15% faster than the Apple A11 and four high-efficiency cores which are claimed to use 50% less power than the energy-efficient cores in the A11. The A12 features an Apple-designed 64-bit ARMv8.3-

A six-core CPU, with two high-performance cores running at 2.49 GHz called Vortex and four energy-efficient cores called Tempest. The A12 also integrates an Apple-designed four-core graphics processing unit (GPU) with 50% faster graphics performance than the A11. The A12 includes dedicated neural network hardware that Apple calls a "Next-generation Neural Engine". This neural network hardware has eight cores and can perform up to 5 trillion operations per second.

## Specification of model iPhone Xs

Capacity: 64GB, 256GB, 512GB

Size:

Height: 5.65 inches

Width: 2.79 inches

Depth: 0.30 inches

Weight: 177grams

Display: 5.8"

Super Retina HD display

All-screen OLED

2436x1125 pixel resolution

3D Touch

Fingerprint-resistant

oleophobic coating

Chip: A12 Bionic

Camera: Dual 12-MP wide-angle and telephoto cameras and Six-Element lens

Image format:

HEIF and JPEG

Video Recording:

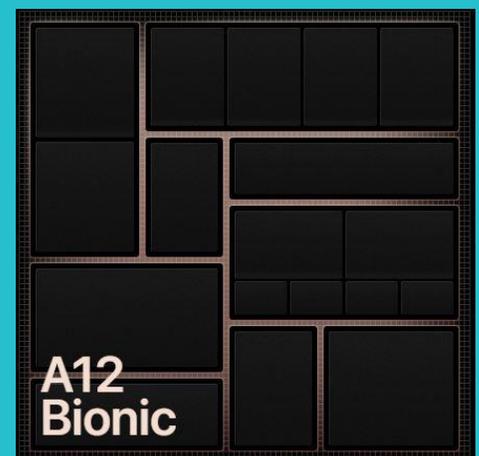
4K video at 24fps, 30fps or 60fps

Slow motion video for 1080p at 120fps or 240fps

Face ID: TrueDepth camera for facial recognition

OS: iOS 12

SIM Card: Dual SIM( nano-sim, eSIM )



# TI's mmWave Sensors

*“The world’s most precise millimeter wave sensor available today on a single chip.”*



Texas Instruments (TI) (NASDAQ: TXN) is bringing an unprecedented degree of precision and intelligence to a range of applications spanning the automotive, factory and building automation, and medical markets. TI's new millimeter wave (mmWave) single-chip complementary metal-oxide semiconductor (CMOS) portfolio includes five solutions across two families of 76- to 81-GHz sensors with a complete end-to-end development platform. Available for sampling today, the AWR1x and IWR1x sensor portfolio delivers up to three times more accurate sensing than current

mmWave solutions on the market. The combination of sophisticated analog design techniques paired with digital signal processing enables designers to implement intelligent and contactless sensing in their systems.

## mmWave sensor to Industrial application

Servicing the need for improved efficiency in factory, building automation systems and smart infrastructure, developers are now able to leverage TI's intelligent and robust portfolio of mmWave sensors. In addition, this sensing technology can be used to transform existing capabilities in growing areas such as medical equipment, tank-level sensing, robotic vision and drones. TI's IWR1x mmWave contactless sensors can be used in environments without interference from lighting, rain, dust, fog or frost, making them

uniquely robust indoors or outdoors. By determining the range, velocity and angle of objects around the equipment, the sensors can adapt to dynamic scenarios instantaneously.

The TI mmWave sensor portfolio for industrial applications includes two single-chip devices. "The IWR1443 mmWave sensors integrate a hardware accelerator for radar signal processing," explains Delagi, "while the IWR1642 sensors use a DSP to perform the required processing."

According to Delagi, the DSP provides users with more flexibility and allows for further software integration of other higher-level algorithms, such as tracking and classification.

TI believes these single-chip devices will provide simple access to high-accuracy object data, including range, velocity and angle. That, it contends, will enable advanced sensing in a

range of new applications that demand performance and efficiency, including smart infrastructure and Industry 4.0 in factory and building automation products.

The mmWave sensor portfolio has been designed so that it can adapt dynamically to changing conditions, bringing multi modal functionality to avoid false positives and delivering a broad

range of sensing to multiple applications.

*Source:* Neil Tyler  
([www.newelectronics.co.uk](http://www.newelectronics.co.uk))  
([www.ti.com](http://www.ti.com))

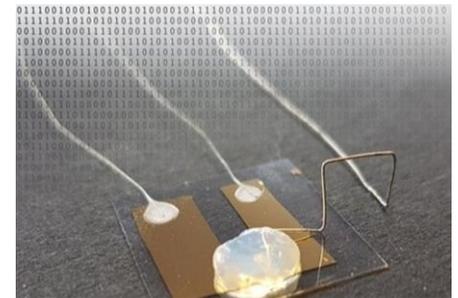
## Smallest transistor switch with single atom

Researchers have developed a single-atom transistor, the world's smallest. This quantum electronics component switches electrical current by controlled repositioning of a single atom, now also in the solid state in a gel electrolyte. The single-atom transistor works at room temperature and consumes very little energy, which opens up

entirely new perspectives for information technology.

The transistor exclusively consists of metal, no semiconductors are used. This results in extremely low electric voltages and, hence, an extremely low energy consumption.

*Source:* Karlsruhe Institute for Technologie(KIT)



## 3D print prototype for 'bionic eye'

A team of researchers has, for the first time, fully 3D printed an array of light receptors on a hemispherical surface. This discovery marks a significant step toward creating a 'bionic eye' that could someday help blind people see or sighted people see better.

"Bionic eyes are usually thought of as science fiction, but now

we are closer than ever using a multimaterial 3D printer," said Michael McAlpine, a co-author of the study and University of Minnesota Benjamin Mayhugh Associate Professor of Mechanical Engineering.

*Source:* University of Minnesota



## Expert Lecture/Seminars/Courses/Industrial Visits Organized

- An expert talk on “How to become an Entrepreneur” was conducted by Mr. Akshay Jalgaonkar, alumni and Director of Yash Electro Atrs, Nashik on 3<sup>rd</sup> July 2018.



Felicitation of Mr. Akshay Jalgaonkar (Director- Yash Electro Arts) by Prof. Dr. D.M.Chandwadkar



Mr. Akshay Jalgaonkar interacting with B.E.(E&TC and Electronics) students

- An expert talk on “Different funding agencies for start-up” was conducted by Rohit Bagad, Founder & CEO Inuxu Digital Media Technologies Pvt Ltd., Pune on 5<sup>th</sup> July 2018.



Felicitation of Mr. Rohit Bagad (CEO- Inuxu Technologies) by Prof. Dr. D. M. Chandwadkar



Mr. Rohit Bagad (CEO- Inuxu Technologies) interacting with B.E.(E&TC and Electronics) students

- An expert talk on “Competitive Exam (UPSC-IES)” was conducted by Dhiraj Gurale, Indian Railways on 7<sup>th</sup> July 2018.



Felicitation of Mr. Dhiraj Gurale (IES-Indian Railways) by Prof. Dr. D. M. Chandwadkar under Career Development Cell of E&TC Department



Delivering expert lecture on "Competitive exam UPSC-IES" by Mr. Dhiraj Gurale(UPSC-AIR-18)

- An expert lecture on “Importance of Entrepreneurship” was conducted by Mr. Varun Dabke (Director- Suntech Consulting), Nashik on 9<sup>th</sup> July 2018.



Mr. Varun Dabke (Director- Suntech Consulting) interacting with B.E.(E&TC and Electronics) students

- A session on “C-programming revision for KPIT interview ” was conducted by Ms.Kanchan Naik on 10<sup>th</sup> July 2018.
- Orientation program was conducted for SE students to get familiar with department and facilities on 10<sup>th</sup> July.



SE (E&TC ELTX) Orientation Program for AY 2018-19 Organized on 10th July 2018



SE (E&TC ELTX) Orientation Program for AY 2018-19 Organized on 10th July 2018

- An expert talk on “Different modules and activities performed in an organization” was conducted by Mr. Archan Oke, Director- Craft Tech, Nashik on 11<sup>th</sup> July 2018.



Mr. Archan Oke (Director - Wave Systems) Guided T.E. & B.E.(E&TC) students



Mr. Archan Oke (Director- Wave Systems) Interacting with T.E. & B.E.(E&TC) students

- Workshop on seminar on “Introduction to measuring instruments and calibration process ” conducted by Mr. Asim Kumar Saha from Aplab, Mumbai on 11<sup>th</sup> July 2018.
- Expert Lecture on "Recent Trends in Microwave Engineering" conducted by K. P. Singh, Technical Director, Anant Ultralab Industries on 14<sup>th</sup> July 2018.
- Mock interviews conducted for BE students for campus readiness of KPIT conducted by Mr. Sanket Karlekar and Mr. Sohan Desale from Crompton Greaves, Ltd, Nashik on 21<sup>st</sup> July 2018.



- Expert talk on “GATE-Competitive Exam” conducted by Mr. Sushil Kumar Suman, 136<sup>th</sup> Rank in DRDO exam on 16<sup>th</sup> August 2018.



- Expert talk on “Life Management” was conducted by Mr. Swami Shrikanthanand on 17<sup>th</sup> August 2018.



- Expert talk on “UPSC-IAS Exam” was conducted by Mr. Harshad Dhananjay Bele Director, Connect India IAS Academy on 30<sup>th</sup> August 2018.



- Industrial visit to TRACTION Machine Workshop, Nashik was organized for SE students on 18<sup>th</sup> August 2018.



## Campus Placement

Sr. No.	Name of the Company	No. of students Placed
1.	KPIT	15
2.	FINIQ	1

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# The Zenith

November 01, 2018

Volume 1, Issue 6



## Contents:

Google Pixel-3 XL (2)

Lithium Coin Cell Range (2)

MediaTek Helio P70 SoC (3)

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Electro-optic laser Pulse(4)

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dustrial Visits Organized (5)

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Exhibition (8)

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# Google Pixel-3 XL

Google Pixel 3 XL smartphone was launched in October 2018. The phone comes with a 6.30-inch touchscreen display with a resolution of 1440 pixels by 2960 pixels.

The Google Pixel 3 XL is powered by 2.5GHz octa-core (4x2.5GHz + 4x1.6GHz) processor and it comes with 4GB of RAM. The phone packs 64GB of internal storage that cannot be expanded. As far as the cameras are concerned, the Google Pixel

3 XL packs a 12.2-megapixel (f/1.8, 1.4-micron) primary camera on the rear. On the front, it packs an 8-megapixel (f/2.2) primary camera and a 8-megapixel (f/1.8) secondary camera.

Source: <https://store.google.com>

## Specification of model Google Pixel-3 XL

Capacity: 64GB

Size:

Height: 158 mm

Width: 76 mm

Depth: 7.9 mm

Weight: 184 grams

Display: 6.30"

1440x2960 pixel resolution

Gorilla glass

Aspect ratio 18.5:9

oleophobic coating

Processor: Snapdragon 845

RAM: 4GB

Sensors:

3D face recognition, Fingerprint

sensor, Compass/

Magnetometer, Proximity

sensor, Accelerometer,

Ambient light sensor,

Gyroscope, Barometer



## High drain and extended temperature models for its lithium coin cell range

Murata has announced the development of two high drain and extended temperature additional ranges for its offering of lithium coin cell batteries.

Building on Murata's standard and heat-resistant ranges of 'CR' battery sizes, the high current type, designated suffix 'R', has twice the maximum pulsed discharge rating of conventional models at 50mA (three seconds at 2V or higher, at 50 % nominal capacity, 23°C) and three times the discharge time (45mA pulsed for three seconds, 23°C). These

characteristics make the parts suitable for Low-Power Wide-Area (LPWA) communications devices, including LoRa and SIGFOX with their high peak current requirements.

New extended temperature types designated suffix 'X' are available in package sizes CR2032, CR2450, CR2477 and CR3677 and have an extended operating temperature range of -40°C to +85°C compared with standard types rated at -30°C to +70°C.

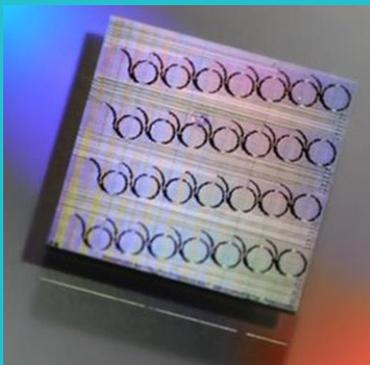
Source:

[www.newelectronics.co.uk](http://www.newelectronics.co.uk)



# MediaTek Helio P70 SoC

**“The Fast, fluid and Fun Gaming Multi- Threaded Processor”**



The MediaTek Helio P70 builds on the P60's global success and critically acclaimed mix of class-leading hardware to provide even better experience for users, while brands can build powerful devices with great diversity.

It achieves this through deep power efficiency improvements, further feature upgrades and clock-speed enhancements. For the user it means longer battery life, a more sustainable, higher performance and up to 4.5°C lower temperature versus competitor alternatives.

The MediaTek Helio P70 incorporates a powerful Arm

Cortex-A73/A53 octa-core CPU complex with an impressive Arm Mali-G72 class GPU. Versus the prior P60, the faster clock speeds generate up to 13% more performance. In-hand, there's support for 20:9 displays at Full HD+ resolution that allow users to enjoy the most beautiful and modern smartphone designs with full fascia coverage.

*Source:*

<https://www.mediatek.com>

## Power-efficient generation of ultrashort pulses on a chip

Ultrashort optical pulses are useful for a wide range of applications such as processing materials via strong light-matter interaction. In the frequency domain, a train of pulses represents an equidistant grid of frequency lines, known as an “optical frequency comb”, which is essential for timing, metrology and spectroscopy.

Though frequency combs were first demonstrated in complex mode-locked laser setups, it was demonstrated more than a

decade ago that they can also be generated in microresonators with sufficiently high quality (Q) factor. This technology, known as “soliton microcomb”, has been rapidly evolving in the past years, yielding new techniques in compact forms and simplified structures, such as frequency synthesis and dual comb spectroscopy.

A key goal in the field is to build high-Q microresonators on a microphotonic chip that can be integrated into electronic devices for portable applications. To this end, modern CMOS-compatible.

fabrication techniques must be utilized, which have been developed for decades and used in the semiconductor industry. Silicon nitride (SiN), widely used as diffusion barriers in integrated circuits, is the most promising material to construct microresonators based on integrated waveguides. Yet, currently the Q factor of SiN microresonators is still

comparatively low. Therefore, to generate soliton microcombs in SiN microresonators, complicated and power-hungry setups including optical fiber amplifiers are still needed, which makes the target – “building a soliton microcomb on a chip” – extremely challenging. With the SiN microphotonic chip, which is only 0.5 mm \* 0.5 mm, the LPQM team demonstrated

soliton microcomb generation with only 10 mW laser power, and a train of coherent pulses with less than 100 GHz repetition rate.

*Source:*

J. Liu, A. S. Raja, M. Karpov, B. Ghadiani, M. H. Pfeiffer, B. Du, N. J. Engelsen, H. Guo, M. Zervas, and T. J. Kippenberg, “Ultralow-power chip-based soliton microcomb for photonic integration

## How to mass produce cell-sized robots

Tiny robots no bigger than a cell could be mass-produced using a new method developed by researchers at MIT. The microscopic devices, which the team calls "syncells" (short for synthetic cells), might eventually be used to monitor conditions inside an oil or gas pipeline, or to search out disease while floating through the bloodstream.

This photo shows circles on a graphene sheet where the sheet is draped over an array of round posts, creating stresses that will cause these discs to separate from the sheet. The gray bar across the sheet is liquid being used to lift the discs from the surface.

*Source:* Massachusetts Institute for Technologie(MIT)



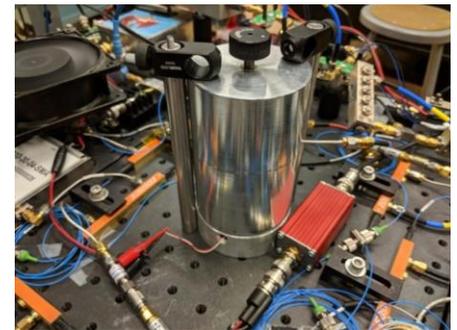
## New electro-optic laser pulses 100 times faster than usual ultrafast light

Physicists at the National Institute of Standards and Technology (NIST) have used common electronics to build a laser that pulses 100 times more often than conventional ultrafast lasers. The advance could extend the benefits of ultrafast science to new applications such as imaging of biological materials in real time.

NIST's ultrafast electro-optic laser relies on this aluminum "can" to

stabilize and filter the electronic signals, which bounce back and forth inside until fixed waves emerge at the strongest frequencies and block or filter out other frequencies.

*Source:* National Institute of Standards and Technology (NIST)



## Expert Lecture/Seminars/Courses/Industrial Visits Organized

- An expert talk on “Application of Transformers and Motors in Indian Railways” was conducted by Mr. V. N. Bodade Sr. Section Engineer, Nasik Road Railway Station on 20<sup>th</sup> September 2018.



- An expert talk on “Linux Operating System” was conducted by Prof. Lalit Patil, Assistant Professor, KKWIEER, 24<sup>th</sup> September 2018.
- A workshop on “Internet of things” was organized for BE students. The workshop was conducted by Mr. R. S. Tiwari on 26<sup>th</sup> September 2018.



- An expert lecture on “What do you need to be an Entrepreneur” was conducted by Mr. Sanjeev Mishra, Founder & CEO, Staenz Solutions, Nashik, 27<sup>th</sup> September 2018.



- An expert talk on “Sacrifices Made by Armed Forces in Protecting the Borders” was conducted by Mr. J. B. Singh Ex. HFO on 29<sup>th</sup> September 2018.



- Industrial visit to Caprihans India Ltd. Nashik was organized for TE students on 20<sup>th</sup> September 2018.



- Industrial visit to Reliance Electronics, Nashik was organized for BE students on 21<sup>st</sup> September 2018.



## Campus Placement

Sr. No.	Name of the Company	No. of students Placed
1.	TCS	10

## e-Ganesh Competition

The E-Ganesha Competition was held in E & TC department of K. K. Wagh Institute of Engineering Education & Research, Nashik in collaboration with IETE on 24th September 2018. The theme was to combine advanced Electronics with spirituality, to decorate our Bappa using Electronics.

The objective of the competition was to show usage of electronics in Ganesha decoration & enhancement of students' interest in electronics field. The creativity was encouraged and innovativeness was judged. The responsibilities relevant to the professional engineering practice were developed among the students. They worked effectively as an individual, and as member in diverse teams, and in multidisciplinary settings.

The program was inaugurated by Dr. D. M. Chandwadkar, Head of Dept, E & TC and Dr. S.P. Ugale. The competition was judged by Ms. Poonam Deshmukh & Ms. Deepali Gangurde, Emerson, Nashik who are also alumni of the department. Prof. Rupali V. Chothe and Prof. S. S. Ansari organized the event. SAAE(Students' Association of Electronics Engineering) students took great efforts to organize the same.

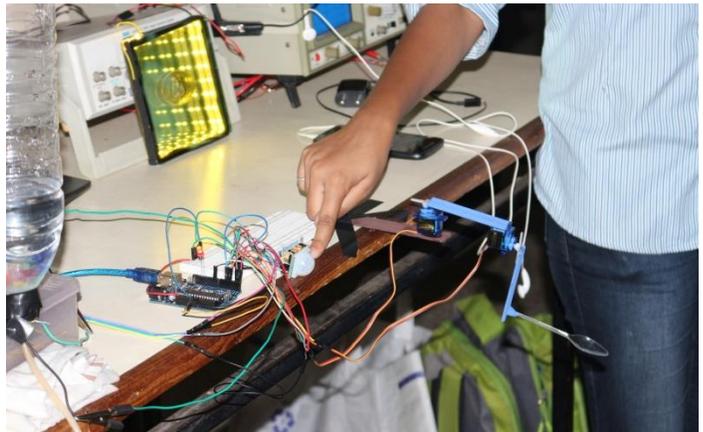
Many groups, each consisting of 3 to 4 students, enthusiastically participated in the competition, out of which 3 groups were declared winners. The participants used electronic concepts very innovatively for the decoration purpose. All projects were very nicely designed and developed by the students.

The winners of the competition are:

First Prize: Rs. 2500 (Vaibhav Jaipurkar, Tushar Joshi, Gaurav Biyani, Tanmay Pathak)

Second Prize: Rs. 2000 (Ruchita Yadav)

Third Prize: Rs. 1500 (Nupoor Patil, Vaishanavi Dusane, Tanvi Purohit, Pranal Kolhe)



## Project Based Learning Exhibition

Project based learning exhibition is organized by Electronics & Telecommunication department on 13<sup>th</sup> Oct 2018 from 11.00 am to 2.00 pm.

Objectives of project based learning are

1. To improve technical skills in students like Circuit Designing, Circuit testing (Hardware, software), troubleshooting and Programming etc.
2. To improve soft skills in students like Communication skills, Presentation, Report writing etc
3. This approach gives students a relevant learning experience and encourages the transfer of knowledge to new situations.
4. To improve following abilities in students like critical thinking, communication and cooperation in students

Around 50 micro and mini projects done by second, third and fourth year students were presented in exhibition. Second year students have done projects under subject digital electronics and electronics test and measuring instruments. Third year students have done projects under subject electronics system design , project done by fourth year students are form the subject VLSI design and technology. Electronics hobby projects done by students were presented in open category. Major projects done by PG students are also kept in exhibition, there were 8 such projects.

Mr. Akshay Kulkarni from Crompton Greaves, Nashik ,Ms. Dipika Pawar from Motwane Pvt.Ltd, Ms. Surbhi Jalori from Emerson, Nashik and Mr. Rahul Patil are the experts from industry who was invited for inauguration and evaluation of projects. Dr. D.M. Chandwadkar H.O.D. E&TC and ELTX motivated students to design more innovative and application specific projects.

### Photographs of event





## Industrial Training / Seminar/Workshop done by Staff

Sr. No.	Type of Event	Name Of Staff	Duration
1	NPTEL course on "Stress Management"	Prof. D. C. Shimpi	4 Week
2	NPTEL course on "Introduction to Machine Learning"	Prof. Dr. M. R. Admane	8 Week
3	NPTEL course on "Introduction to Machine Learning"	Prof. P. J. Mondhe	8 Week



**Elite**

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(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to  
**DEEPALI CHETAN SHIMPI**  
 for successfully completing the course  
**Stress Management**  
 with a consolidated score of **70 %**

Online Assignments	23.33/25	Proctored Exam	46.5/75
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 Prof. Anupam Basu  
 NPTEL Coordinator  
 IIT Kharagpur

Total number of candidates certified in this course: **1082**  
  
**Aug-Sep 2018**  
 (4 week course)

  
 Prof. Adrijit Goswami  
 Dean  
 Continuing Education, IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL18GE18S11630154

To validate and check scores: <http://nptel.ac.in/noc>

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