



Vidya Vikas Education Trust's

# Universal College of Engineering

Approved by AICTE, DTE, Maharashtra State Government and Affiliated to Mumbai University

Accredited with B+ Grade by NAAC | Recognised as Linguistic (Gujarati) Minority Institution

## ELECTROBUZZ

**COMPILED AND DESIGNED BY:**

*Ms. Sampada Pimpale*

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### *Department Vision:*

To be recognized for practicing the best teaching-learning methods to create highly competent, resourceful and self-motivated young electronics engineers for benefit of society.

### *Department Mission:*

- To nurture engineers who can serve needs of society using new and innovative techniques in electronics.
- To improve and apply knowledge of electronics subjects through participation in different technical events.
- To enhance carrier opportunities of electronic students through industry interactions and in plant training.
- To install the passion and spirit among students to pursue higher education in electronics and entrepreneurship.

## *The New Education Policy 2020 is set to be a landmark in India's history of education*

The New Education Policy 2020, that will certainly be a landmark in the history of education in India, has been approved by the government after wide ranging consultations. The policy is comprehensive, holistic, far sighted and will certainly play a great role in the nation's future growth of the nation. I must commend the TSR Subramanian Committee in 2016 and the K Kasturirangan Committee for having done a stellar job.

The policy places a welcome emphasis on a holistic, learner centred, flexible system that seeks to transform India into a vibrant knowledge society. It rightfully balances the rootedness and pride in India as well as acceptance of the best ideas and practices in the world of learning from across the globe.

I note with great satisfaction that one of its loftier goals is to bring two crore out-of-school children into the school system and reduce dropouts. Reduction in the burdensome syllabus, focus on vocational education and environmental education are crucial aspects well covered by NEP. Students will be much more empowered and have the opportunity to choose the subjects they wish to learn.

Another welcome step is an attempt to improve governance by bringing in a single regulator to look after all institutions barring medical and law colleges. The policy gives a fillip to holistic education by envisioning the convergence of science and arts streams. The focus on ethics and human and Constitutional values will go a long way in the creation of an enlightened citizenship essential for deepening our democratic roots.

The policy also expands the scope of foundational education, increasing the school-going years from 3 to 18 instead of the prevalent 6 to 14. This will enable a more holistic development of children in the formative age group of 3-6 years. Setting up a National Mission on Foundational Literacy and



Numeracy is a much needed, timely step to improve the quality of education at the primary education level. NEP recognises the importance of nutrition to the all-round development of children and has therefore included a provision for an energy-filled breakfast, in addition to the nutritious mid-day meal, to help children achieve better learning outcomes.

A much-discussed stipulation in the new education policy stresses that the medium of instruction until at least fifth grade (preferably eight grade) will be in a regional language that is recognised as being native to India. This is a welcome step, as mother tongue plays a highly critical role in the overall development of the child. Mother tongue, which a child hears right from the moment he or she is born, provides personal identity, connects with culture and is crucial for cognitive development.

Education in mother tongues will also help children develop an interest in regional literature and culture and help them understand better the customs and traditions that are indigenous to a particular region. I am glad that the policy also places great emphasis on classical languages of India.

India is a large and diverse country with a cornucopia of languages, dialects and mother tongues. A number of developed countries in the world educate their children in mother tongues. When world leaders call on me, they prefer to speak in their mother tongues even though they are proficient in English. Great scholars prefer to write and speak in their mother tongues. There is a certain pride associated with speaking one's mother tongue and we must inculcate this sense of pride in our children.

In spite of the stress laid on regional languages, the policy states clearly and unequivocally that there would be no imposition of any language and no opposition to any language. This is indeed a welcome move.

This education policy was long overdue. Now focus needs to shift to its efficient and effective implementation. States and the Union government have to work together to make the change happen in the classrooms. I am confident that if implemented well, this policy is the way forward to make India a thriving knowledge hub.

While NEP aims to increase public investment in education from the current 4.3% to 6% of GDP, we must have a time frame for this to be implemented.

Source: <https://timesofindia.indiatimes.com/blogs/toi-edit-page/the-new-education-policy-2020-is-set-to-be-a-landmark-in-indias-history-of-education/>

## *Raising core-infrastructure performance*



Moving, managing, and analyzing data is at the heart of everything, from remote IoT endpoints capturing data to always-connected personal IoT devices, and the growing reliance on AI-centric applications for enterprise and scientific research.

Digital lifestyles and the emerging IoT are inextricably connected with the rapid growth of computing and data services in the cloud and 5G New Radio (NR) will place intense pressure on the capacity and performance of backhaul, metro, and core networks.

There is strong demand for increased data bandwidth and compute throughput across cloud data centers and in telecom and cellular-backhaul networks, touching key components including the links into and out of data centers, data centre interconnects (DCI), infrastructure interface cards, and accelerator cards.

Building new and higher performing equipment to meet these demands using discrete components will increasingly be unable to scale with performance demands. Next-generation equipment is going to have to deliver significantly increased performance within existing physical, electrical, and thermal boundaries.

In addition, design work needs to begin using the latest protocols and standards before the final specifications are agreed, in order to be market ready at the earliest possible opportunity. Waiting for specifications to mature is not an option for equipment providers, so flexibility to adapt at a hardware level as the project progresses will be required.

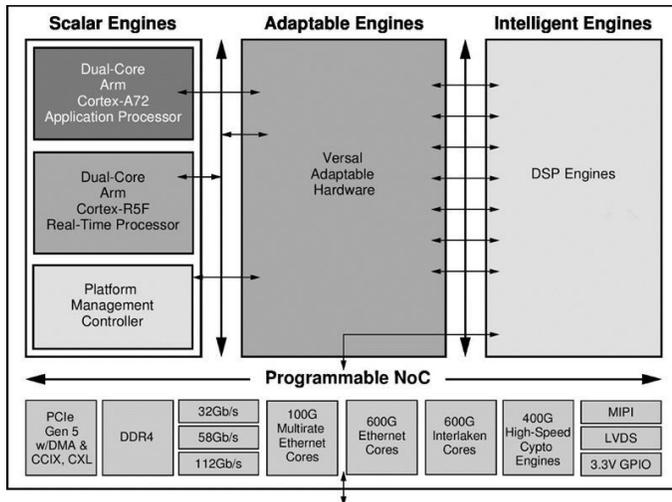
Programmable logic devices such as high-density FPGAs and programmable System-on-Chip ICs (MPSoCs) have become the accelerator of choice for workloads that cannot be executed quickly enough in conventional CPU or GPU architectures or do not satisfy power constraints. Offering a high degree of parallelism to offload specific compute challenges these also provide inherent adaptability as programmable devices.

Now, to satisfy more recent and more demanding performance, bandwidth, power, and integration targets, a new class of programmable devices called Adaptive Compute Acceleration Platform (ACAP) has emerged.

The Xilinx Versal ACAP contains an array of intelligent AI and DSP compute engines, adaptable engines equivalent to FPGA logic fabric, and application-processing and real-time scalar engines, closely coupled through a programmable Network on Chip (NoC) interconnect.

Software-controlled platform management and state-of-the-art interfaces including DDR4, 100G Ethernet, PCIe Gen 5, and multi-gigabit optical interfaces are also integrated.

The Versal DSP engines feature improved DSP blocks with native support for operands such as INT8, 32-bit floating point, and others, to increase the speed and efficiency of applications that include not only digital signal processing but also wide dynamic bus shifters, memory address generators, wide bus multiplexers, and memory-mapped I/O registers. The scalar engines comprise a dual-core Arm Cortex-A72 application processor and dual-core Arm Cortex-R5F real-time processing unit.



The ACAP's heterogeneous engines can be reprogrammed to adapt to workloads that change over time, or as algorithmic implementations or neural-network models evolve.

These high-bandwidth devices combine high compute density with additional dedicated high-speed cryptographic (HSC) engines and state-of-the-art

network interfaces.

The intensive network connectivity includes scalable optical transceivers up to 9Tb/s total bi-directional bandwidth supporting the latest Ethernet and Interlaken rates and protocols, 112Gb/s PAM4 transceivers, and cryptographic processing with up to 400Gb/s high-speed crypto engines, and adaptable hardware, (See Figure 1).

Compared to existing 58Gb/s PAM4 technology, using 112G PAM4 transceivers allows a doubling of bandwidth density per port, easing pressure on front-panel rack space and allowing a doubling of bandwidth per unit volume in Telco and data centre applications.

At the same time, the latency for transmitting a given payload of data is 50% lower, which enables applications to be more responsive and helps mitigate latency impacts when interconnecting geographically distributed data centers.

The resources integrated on-chip provide up to three-times the bandwidth and double the compute density of Xilinx's 16nm Virtex UltraScale+ FPGAs while, when compared to a dedicated application-specific OTN (optical transport network) processor, application-throughput capability is three to five times greater.

SOURCE:<https://www.newelectronics.co.uk/electronics-technology/raising-core-infrastructure-performance/229451/>

## *Our cities transformed*

Could Covid-19 be a ‘trigger moment’, accelerating the digitalization of our cities as we look to contain, monitor and suppress the pandemic?

According to research conducted by Grand View Research two years ago, the global market size of smart cities was expected to reach \$2.6tn by 2025.

Today, the disruption caused by Covid-19 is expected, albeit temporarily, to have slowed or curtailed many smart city development plans, but in the longer term growth is expected to return and accelerate. In many respects, the pandemic has seen the use of technology grow as cities have sought to contain, monitor and suppress the pandemic with a myriad of new applications and solutions.



Covid-19 is driving the need for greater urban resilience and is seen as having actually boosted digital transformation strategy agendas, despite much of what has been done being improvised and decisions having to be taken ‘on-the-fly’.

According to Dominique Bonte, vice president, end markets, at ABI Research, this has resulted in a rich “laboratory type learning experience,” as smart technologies have been deployed across cities.

According to Bonte, we can expect to see drones being used for communication and enforcement of social distancing rules, as well as for the delivery of supplies; the appearance of new and different forms of surveillance; the growing use of autonomous freight as well as the deployment of real-time dashboards and data sharing to deliver tracking solutions.

The pandemic has triggered a massive uptake in e-government services, e-health, remote working, online education, and e-commerce, all of which will have an impact on how cities operate and how we, as individuals, engage with them.

Normally bustling cosmopolitan hubs, cities have been hit hard by Covid-19 and many urban planners now think that there will need to be a major rethink on how cities operate.

Many believe that the pandemic will help to transform how technology is used in smart cities and accelerate current trends.

“It’s no secret that organizations across all industries have changed their working practices in response to Covid-19. We’ve witnessed companies being inventive in a variety of ways, but one factor that connects them all

is the rapid acceleration of digital transformation,” suggests Jamie Hayes, Mobile Network Operators Director at BT Wholesale.

“If you take the NHS, for example, it has undergone years of transformation in the space of a few months. City councils that are ultimately in charge of seeing the delivery of the smart city vision

have been exposed to this increase in digital transformation too – they will have been connecting, for example, with co-workers with new remote working tools. Therefore, it wouldn't be surprising if we see smart city timelines bought forward because we know how quickly we can embrace new technology.”

Smart cities have also been actively helping to control the pandemic, according to Hayes, and in places like Seattle and Hong Kong, thermal imaging, body scanners, and infra-red CCTV have all been added to control population risks and to help local governments contain further outbreaks.

“What the world needs is more insight,” suggests Alistair Fulton, General Manager, Wireless (LoRa) & Sensing Business at Semtech.”We need to better understand what's going on for a number of different reasons. We need to improve the efficiency of processes and there's a need to drive more efficient consumption.

“What that boils down to is how to get more from less, whether the less is energy, chemicals, water or whatever. Investment is often triggered by adversity.”

Another trigger, according to Fulton is social or societal needs. “By any measure Covid-19 has been a unique experience with a host of consequences,” he argues. “We will need more data and information about how people behave and where they are and how they're interacting with one another. Because if we don't have that information, then we can't help people do what we know works i.e. social distancing.”

Many see parallels with the 2008 global financial crisis, which helped to propel the first global wave of smart city projects.

“Then an economic crash and government budget shortfalls created an impetus for cities to collaborate with technology firms to address urban problems and generate new sources of revenue,” says Fulton. “Covid-19 will prove, like the financial crisis of ten years ago, to be a trigger moment. The next stage of the pandemic will be a massive economic shock that will, in turn, force companies and organizations to engage and embrace technology.”

### **Collective intelligence**

Damien Stephens, Associate Vice President, Mobility & IoT, Tata Communications agrees. “The pandemic has given a much required boost to connected technologies. Along with collaboration solutions that enable remote operations, sensors and IoT-enabled devices are playing a critical role in ensuring minimal human-touch during current times.”

He suggests that Covid-19 has had, and will continue to have, a significant short-term negative impact on the development of some shared mobility services.

“Smart services such as ride-hailing solutions have been impacted by the lockdowns imposed in most countries. But there are moves to change this impact. Digital technologies have already begun creating solutions to the challenges that public transport faces due to Covid-19. For instance, with smart technologies public transport providers will be able to monitor how crowded services are, and suggest alternate routes for commuters looking to avoid busy services. IoT and connectivity will play a crucial role in reassuring citizens that public transport is safe to use.”

## *Advances in user interface design*

Ian Crosby from touch screen manufacturer Zytronic, looks at the considerations that need to be taken into account when a product designer is planning a device that has a touch interface.

In a world that expects every display to be interactive, touch screens are now a natural part of everyday life – from smartphones and tablet computers to ticket machines and self-service check outs.

Despite their ubiquity, however, many product and industrial designers still opt for generic touch screens in their designs – fearing high tooling costs and lack of flexibility when it comes to prototyping. They design a product and choose a generic, rectangular touch panel when there can be distinct advantages to sometimes selecting a solution that has been precisely tailored to the application, both in terms of appearance, and performance.



There is a real challenge when it comes to finding a touch screen manufacturer that can help deliver innovation in user interface design. You will need to find a partner that can quickly produce prototypes without high upfront engineering costs or prohibitively high MOQs, and one that can work closely with you to understand the unique requirements of your project and then propose a customized touch interface, which is not only designed to enhance the user experience but also operate faultlessly in the chosen application. When it comes to designing a touch interface there are a number of considerations that need to be taken into account.

### **Environment**

When your product is made for outdoor, unsupervised use, certain elements of touch screen design become challenging. The threat of bad weather and vandalism necessitate thicker glass, which can be an issue for responsiveness, when using conventional capacitive touch panels. The overall product must be designed with the touch screen integrated as a core element of the system from the outset – ‘bolting on’ an unsuitable touch screen as an afterthought increases the risk that it won’t properly operate in your self-service device when exposed to rainwater, surface contamination, etc.

You must also consider the use your product is being designed to fulfill and how that affects the touch panel. For industrial or medical uses, for example, the touch screen must be capable of working reliably with gloved hands.

## Hygiene and cleaning



In a post pandemic world, any surface that will be touched by multiple users may be an issue – how do we ensure people continue to interact with a touch screen safely? If a touch panel is planned as part of your project, you should try to ensure that the screen is designed to be fully flat to the product with no recesses or raised areas, which could lead to dirt, dust and potentially harmful microbes being trapped and also make the screen harder to clean. A product designed with the right touch screen from the outset will instead be able to be wiped down easily. As in the above point, the screen must also be able to register input from gloved hands and be resistant to harsh disinfectants and scrubbing.

## Intended purpose

Will your product be used by a single end-user or, like an interactive whiteboard for business use, will it need to respond to multiple inputs from several users simultaneously? Again, this should be considered holistically from the project outset, as retroactively installing a multitouch overlay might not work with some types of displays. The touch sensor and underlying panel should be considered together and at the design phase and then form, fit and function tested in an integrated, working prototype model.

## Accessibility

A new challenge for designers of self-service systems, is matching the expectation of touch technology with the real challenge of providing fair accessibility for any potential user. Therefore, if a product is being designed to include a touch screen, due consideration should be made to ensure that the technology can be used by all, including disabled and visually impaired users. These additions or custom elements must be planned and tested at the design and prototyping stage rather than retrospectively, and for that reason the correct touch solution must be selected early in the product design cycle.

A designer may begin with an idea and then create a 3D rendering – but only by testing a real, physical prototype can the idea be verified and presented to a client. To all product designers: there is now no need to limit yourself to simple or unsuitable touch panels – you can give free reign to your ideas and concepts and begin exploring the limitless possibilities of the latest projected capacitive touch screen technologies.

Source: <https://www.newelectronics.co.uk/electronics-technology/advances-in-user-interface-design/229207/>

## *New contact-tracing app 'less invasive than Alexa'*

As privacy concerns grow over contact-tracing technology, a new monitoring system funded under the European Open Science Cloud initiative will launch on 10th July that allows users with strong symptoms of corona virus to take full ownership of their personal data while participating in national track-and-trace schemes.

The EOSC Secretariat– an initiative that has approved €1,235,000 in emergency funding for 32 projects to specifically tackle the COVID-19 pandemic – is supporting a new app that will improve contact tracing while simultaneously maintaining privacy.

Concerns that digital tracing systems for COVID-19 could become 'back doors' to mass surveillance have already mounted, with academics from 26 countries issuing a warning that contact-tracing apps could hamper trust. Confirming you have been infected with corona virus requires personal data to be submitted, recorded, exchanged and stored, with some apps like the UK Government's NHSX indicating that it may be stored and used for future research purposes.

But with backing as part of the European Open Science Cloud (EOSC) – an initiative changing the way European research is conducted through 'Open Science' where researchers are quickly developing instant diagnoses for major diseases and tackling climate change – a small research team has been able to respond rapidly to the pandemic and develop a contact-tracing app in the space of a few months. Described by its creators as less invasive to your personal data than Alexa, the application allows users with strong symptoms of corona virus to take full ownership of their personal data while track-and-tracing. The goal of the project is build up a picture of local infection clusters so that targeted regions can be restricted rather than having a blanket ban.

Developed by brothers Paul and Patrick Byrnes, the app invites users to participate via an 'opt-in' facility, which can be removed or deleted at any time, and will be available to download on 10th July 2020 on iOS, Android and Apple.

Source: <https://www.techmezone.com/top-10-news/new-contact-tracing-app-less-invasive-alexa/>



**VidyaVikas Education Trust's**  
**Universal College of Engineering**  
Kaman Bhiwandi Road, Survey No. 146 (Part), Village Kaman, Taluka Vasai,  
District Palghar-401208, Ph-+91 8007000755  
website- [www.ucoe.edu.in](http://www.ucoe.edu.in)/[www.universalcollegeofengineering.edu.in](http://www.universalcollegeofengineering.edu.in)