



Vidya Vikas Education Trust's

Universal College of Engineering

Accredited with B+ Grade by NAAC

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

Current Wave

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College Profile:

Everything you need to know about us:

Embraced by lush greenery and scenic beauty, Universal College of Engineering is a treasured place for aspiring engineers to leave their imprints on success.

As a college within the wider network frame, we are one of the fastest-growing institutions in India. Our institute has been accredited by the National Assessment and Accreditation Council (NAAC) with a B+ grade in the first cycle of accreditation. Times of India Survey Ranked No.1 in India among Top Emerging Private Engineering Institutes for 6 consecutive years 2015, 2016, 2017, 2018, 2019, and 2020 and the saga of accolades continues.

In response to the expectations of quality technical education, our college is approved by the All-India Council for Technical Education (AICTE), New Delhi; Recognized by the Directorate of Technical Education (DTE), Government of Maharashtra; affiliated to Mumbai University. Our college is also associated with professional bodies like IEEE, IETE, ISA, and CSI to update the revolutionary technological advancements.



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We offer 4 years of full-time Bachelor of engineering programs in Computer Engineering, Civil Engineering, Artificial Intelligence & Machine Learning, Information Technology and Data Engineering.

The unique state-of-the-art facility of the institute has been carefully designed to accommodate the needs of the students. Laboratories are equipped with world-class facilities based on the latest technology of different sectors. Our smart classrooms are well ventilated, spacious, and equipped with overhead and LCD projectors along with the public address system. The College library provides arich collection of specialist library resources and services to support student's academic work and enrich their research skills.



We are obliged to equip our students to get placed in highly reputed companies by mentoring their necessary skill set for cutting-edge technologies. The core highlighted areas are helping students with their technical competency, communication skills along with career guidance and counseling.

Universal College of Engineering has produced many successful alumni who are working in reputed organizations in India and abroad and have contributed immensely to the cause of nation- building and society. We welcome all engineering aspirants to create an incredible legacy in the field of engineering.





Diamond wafers in marketing re-jig

DIAMFAB, the three-year-old diamond semiconductor wafer supplier, is moving to a new dual business model strategy. DIAMFAB will sell its technology both directly and through application-oriented strategic partnerships and alliances. The strategy is designed to achieve a scalable go-to-market model implemented through a mix of in-house capabilities and an extended partner ecosystem based on co-development.

“Over the past two years, we have made significant progress working with R&D teams to process high value-added diamond wafers. Our application-oriented approach based on a dual business model will now allow us to work with a broader set of industrial partners, to develop and sell high value-added diamond wafers and our patented diamond devices manufacturing processes, while also selling directly to end users with a fab-light model,” said Gauthier Chicot, CEO of DIAMFAB.

DIAMFAB has already started to work with partners on the design and fabrication of high-performance devices including diodes, transistors, capacitors, quantum sensors, and high-energy detectors. The company’s first market is capacitors for electrical vehicles, where the advantages of diamond semiconductors over actual capacitor technologies show tremendous potential for improving compactness and performance over the lifetime of a vehicle. “We have already filed a patent on an all-diamond capacitor and are collaborating with a leading player in this field,” continued Chicot. Among other parameters, we have achieved our targets: a high current density of over 1000A/cm² and a breakdown electric field larger than 7.7MV/cm. These are key parameters for the performances of future devices and are already superior to what existing materials like SiC can provide for power electronics. Moreover, we have a clear roadmap to reach 4-inch wafers by 2025 as a key enabler for mass production.”

Diamond has the potential to be the ultimate semiconductor due to its superlative electrical properties (5000 higher current density and 30 times higher voltage compared to silicon) and its ability to operate in harsh environments (high temperature and radiation). DIAMFAB’s patented approach to growing synthetic diamond material ranging from a few nanometres in thickness to tens of micrometres is unique in the industry. DIAMFAB diamond wafers can be used for insulator, semiconductor, metallic, and superconductive conduction applications.

In automotive applications, DIAMFAB wafers could allow the fabrication of 80% lighter and more compact power converters. In power grid applications, DIAMFAB wafers could also more easily handle higher voltage and reduce energy losses by a factor of 10 compared to silicon. Applications range from electric vehicles with diamond power electronics devices to IoT with 20 years long life battery, to nuclear and spatial applications with hardened electronics components or detectors in healthcare, and even ultraprecise quantum sensors for autonomous vehicles. DIAMFAB provides a unique control know-how that consists of synthesizing and doping diamond epitaxial layers representing, the only one of its kind in the world. In microwave-generated plasma and under controlled temperature and pressure conditions, the company cracks methane molecules into carbon which are then rearranged on the surface of a diamond seed. At the same time, a precise and controlled amount of boron or nitrogen is added to grow diamond-doped layers and form a high value-added wafer ready for device fabrication.



Next generation Digitizer cards smash transfer speed barriers



The release of two new PCIe Digitizer cards from Spectrum Instrumentation brings next-generation performance to PC-based instrumentation. Using 16-lane, Gen 3, PCIe technology, the cards are capable of streaming acquired data over the bus at a staggering 12.8 GB/s. That is nearly twice as fast as any other PCIe Digitizer currently on the market. Furthermore, it allows the cards to continuously run at their maximum sampling rate of 6.4 GS/s, with 12-bit resolution, and transfer the acquired data directly to PC memory for storage, or even to CPUs and CUDA-based GPUs for processing and analysis.

The new products include the model M5i.3330-x16, a single channel card that can sample at rates up to 6.4 GS/s, and the M5i.3337-x16 (pictured), a dual channel card that offers synchronous 3.2 GS/s sampling on both channels, or the full 6.4 GS/s on a single channel. With 12-bit resolution, these fast digitizers offer exceptional dynamic range. It is up to sixteen times better than most digital oscilloscopes or comparable 8-bit digitizers. The extra resolution improves voltage measurement precision and allows users to capture and characterize fine signal details that are often missed by lower-resolution devices. Timing measurements are also exceptional thanks to a PLL-based internal clock that has better than 1 ppm accuracy. Designed to handle a wide variety of signals, the cards feature fully functional front-end electronics with over 2 GHz bandwidth, programmable full-scale ranges from ± 200 mV to ± 2.5 V, and variable offset. Large onboard memories make the capture of long and complex waveforms easy. A generous 4 GB (2 GSamples) of memory is provided as standard and can be optioned up to a massive 16 GB (8 GSamples) if necessary. Single-shot and multiple-waveform recording modes are supported, together with trigger time stamping. Multiple recording divides the onboard memory into segments and allows the acquisition of numerous events, even at very high trigger rates. It is perfect for situations like those encountered in serial bus testing, or in systems using stimulus-response processes, such as those found in LIDAR and RADAR systems. For added flexibility, the onboard memory can be used as a ring buffer, working much like a conventional oscilloscope, or as a FIFO-buffer, for the continuous streaming of data to the PC environment.



Integration into almost any test system is simple as the front panel boasts SMA connectors for the channel inputs, clock, and trigger inputs and outputs, as well as four multi-functional digital I/O lines. The extra clock and trigger connections make it possible to synchronize the cards with additional digitizers or other measurement devices.

Oliver Rovini, Chief Technical Officer at Spectrum, said “We’re excited by the release of these first products in our new M5i high-performance digitizer family. They bring to market a unique feature set that makes them ideal for situations that require high-frequency signal acquisition and analysis. For example, they’re perfect for capturing the signals found in fiber optics, mass spectrometry, semiconductor testing, RF recording, and quantum technology, just to name a few applications. We’re also delighted by the data transfer speed these cards achieve. Shifting data at rates up to 12.8 GB/s to the latest processor (CPU and GPU) technologies opens up new applications where intensive signal processing is required. For instance, artificial intelligence (AI) systems are now using radio and microwave sensor technology for object detection and identification. This involves the capture and analysis of signals in the MHz and GHz ranges, and it results in the processing of vast amounts of information. Similarly, astronomers scan the skies to collect light or radio waves from distant celestial objects. The data volumes they collect are enormous and analyzing it, to reveal the secrets of the universe, requires a huge amount of processing power. That is where the faster bus on the M5i products is a game changer. It allows continuous streaming of all the data directly to very advanced processing systems. No data is missed, and it can be processed as fast as it arrives. Faster data transfer also provides users with improved measurement speeds and that leads to better productivity, particularly for those running automated testing processes. And finally, there’s the enhanced resolution. This increases measurement precision and that allows test engineers to run trials with tighter tolerances. In turn that enables better quality control!”

To verify the transfer speed of the new digitizers, the company ran the products on a variety of different PC platforms. The maximum transfer speeds were obtained using an AMD EPYC Model 7252 server processor. The company also tested, at full speed, direct RDMA data transfers from the digitizer cards to an Nvidia model P2000 GPU. The capability to stream data directly to a CUDA GPU with up to 5000 processing cores is possible using the company’s SCAPP (Spectrum’s CUDA Access for Parallel Processing) package, which is available as a low-cost option. SCAPP includes the necessary drivers for CUDA GPU support and allows users to develop their own processing routines. Working examples are also included for common functions like continuous averaging for noise reduction or FFTs for spectral analysis.

Installed in a PC, running a Windows or Linux operating system, the cards can be programmed using almost any popular language. This includes C, C++, C#, Delphi, VB.NET, J#, Python, Julia, Java, LabVIEW, and MATLAB. Each card comes with a software development kit that contains all the necessary driver libraries and programming examples. Alternatively, if customers don’t want to write their own code, the company has SBench 6. This powerful GUI provides full card control, along with a host of data display, analysis, storage, and documentation capabilities.



AI & ML Applications for Robotics



Huge algorithms and datasets go into the process of evolving the robotics potential into a human-like vision. The technology revolution in twentieth century changed the outlook of world forever. Technology is now accessible to people sitting at homes and not just limited to laboratories and research institutes. The new realms of electronics, telecommunications, automation, and computation are the driving forces, rather than the mechanical systems of the previous century. In the early 1900s there were almost no telephones, but at the dawn of the millennium mobile phones were an everyday sight; computers were almost unheard of one hundred years ago but have become universal. We are now at the cusp of a new technological

shift of equal significance: the Robotics Revolution. This revolution will place the 21st century at a pivotal position in history. More importantly it will irrevocably impact all our lives and the lives of future generations. When we think of robots, we think of it to be humanoid, to have limbs, to walk, or to talk. But there is a much wider interpretation of what a robot is. Robots are seen increasingly as the interface between AI and humans by the big tech companies. A growing number of businesses worldwide are using transformative capabilities of machine learning, mainly when applied to robotic systems in the place of work. The boundaries between smart materials, artificial intelligence, embodiment, biology, and robotics are blurring. The goal of using artificial intelligence and machine learning for robotics is to produce machines with abilities that go beyond human.

The effective aggregate of robotics, Artificial Intelligence and Machine Learning is establishing the door to entirely new automation possibilities. The evolution of robotic intelligence shows a wide range of hierarchy since the time it was first created. Introduced to be deployed in factories for industrial use, it is not easy to find a sector where robotics is not used today. In the initial days of its advent, robots were merely designed for performing a trained set of repetitive tasks. By then, robotics was operating exclusively on Artificial Intelligence and Machine Learning. The 2000s trace the utilization of Artificial Intelligence in digitally programmed industrial robots. The global scenario has widely changed since then. Skilful integration of Machine Learning (AI) and robotics has been developed to advance the alleged ambit of robotic intelligence, enabling it to attain a sound human vision to detect potent stimuli. Precise machine learning processes are being used to train robots and improve accuracy. Artificial intelligence teaches functions like spatial relations, grasping objects, computer vision, motion control, etc., in robots to make them understand and work on unseen data and situations. The current generation of blending machine learning and robotics allegedly seems to be the most powerful combination in the history of technological innovations. A completely new era of automation is set to disrupt every possible institution of human civilization. AI-driven robots are considered more efficient than the ones without this technology. For instance, the industrial sector stands as the biggest consumer of functions like robotics and further automation, saving time and human effort and ensuring validity, accuracy, and minor errors. AI provides robots with adequate computer vision and motion control to better understand the environment and act accordingly. Similarly, machine learning conditions the robots in such a way that with timely evolution, they learn from their own mistakes, thus preventing constant human intervention and parallel effort. This ensures adaptability in robotics. Along with these implications, AI and ML certainly make manufacturing activities more efficient, especially for big labor-intensive companies; it also improves the available potential of robots.



APPLYING MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE IN ROBOTICS IN VARIOUS SECTORS-

Health & medicine-

AI robotics is transforming the healthcare market. ML-driven robotics is already a massive part of the healthcare chain, including function testing, surgery, research, data integration, etc. AI robotics is widely used to track patients' health status, form a continuous supply chain of medication and other essentials around the hospital, and design custom health tasks for patients. AI and robotics are aiding the healthcare sector by providing assisting robots, precise diagnosis, and remote treatment. Robots' proactive analysis allows them to detect minute and complex patterns in a patient's health graph. Robots driven by machine learning are actively used in hospitals for micro-surgeries such as unclogging blood vessels. One of the biggest gifts of AI robotics to the healthcare industry is its operation in remote areas. Treatment in remote areas has been a major loophole in the medical sector for a long time. Robots can solitarily undergo several clinical tasks.

Agriculture-

Integrating AI, ML, and Robotics provides the farmers with useful insights to help improve their farm productivity. By attaining this information, farmers ensure high yields and low operational costs, thus, stepping towards farm success. The primary fundamental of introducing robotics in farms is cutting down labour efforts by automating farm activities like irrigation, seed distribution, pest control, and harvesting. This renders the growers with much more time to focus on productive tasks. Emphasizing a major advantage of robotics of ensuring precision, it helps mitigate wastage of land potential, thus making a place for effective land use. Robotization of the green economy can help monitor quality enhancement, environmental conservation, and so on. The agricultural colony is gradually shifting towards these technologies, ensuring huge farm success in the wider picture. This creates a need for constant growth in AI-generated robots to improve the global agriculture scenario.

Warehouses-

Big companies with even larger warehouses are big consumers of robotics as it cuts operational time and intermediate costs. High-tech sensors allow these automated devices to operate independently in these huge warehouses. The sensors include visual, auditory, thermal sensors. These sensors are the decision-making body of the robots. Automated guided vehicles (AGVs) are utilized for transporting stock from one place to another in a warehouse. The corporate world today works day and night, and therefore the presence of systems like AGVs sustains 24*7 working with similar costs. Aerial drones are another innovation used in warehouses that sustain quick scanning and optimization of the current inventory within no time and with minimal effort. There are some clear benefits of adopting robotics- minimal errors, adaptability, safety, etc. robots are trained human-like figures which operate on acquired algorithms, thus, avoiding mistakes. An example of machine learning involves picking and placing over 90,000 different part types in a warehouse. This volume of part types would not be profitable to automate without machine learning, but now engineers can regularly feed robots images of new parts and the robot can then successfully grasp these part types.

Automobiles-

The role of robotics has a whole network of applications in the automotive industry ranging from designing, supply chain, and production activities to an entire set of management activities. Systems like driver assistance, autonomous driving, and driver risk assistance are being implemented in transportation for automobile industries. The automobile industry has been using robotic intelligence for more than 50 years. The only change from then to now is the advancement of AI and ML in this branch, which is a drastic one.



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Happy Hour: Mental Health Awareness

On the significant day of Mental Health Awareness, which is celebrated on 10th October every year, the Rotaract Club of Universal College of Engineering decided to pay our special attention to our mental health. Mental health has always been neglected by everyone we know, having inadequate knowledge about how to take care of our own mental health and nourish it we face many shocking results.

We fail to understand that our own mental health is far more important than any materialistic thing in the world.

Keeping this in mind, we welcomed our honourable speaker Ms. Suman Maheshwari, taking her precious time for this important cause and teaching us on the most important topic we don't have any literacy on.



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