

# Yantrik Jagaran

Technical Magazine..



November 2020

Department of Mechanical Engineering



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## Chairman's Message



**Dr. N.SESHA REDDY**  
CHAIRMAN

I believe in the philosophy of thought, word and deed as eternal which made Aditya what it is today. My thought to set a high bar to the institutions I setup by rising to the challenges of the educational field and get prepared for a life dedicated to the pursuit of knowledge, my word which always reflected my vision and gained the conviction of the heads of the institutes and parents, and my deed which makes my home and workplace as extensions of each other by considering the staff and students as the members of my extended family shaped Aditya

I know the value of a good education, more so because I did not have the benefit of the facilities that make the learning process smooth. I began my career as a lecturer, giving up my desire of qualifying in the Service Commission Examination. Out of my despair was born a strong determination which took the shape of Aditya Educational Institutions. The present-day job market poses fresh challenges that need to be managed innovatively. Global business Incubation centre, Microsoft Innovation Centre, Technical Skill Development Institute, T-hub, Training and Placement Cell, GATE coaching etc., act as perfect vehicles for this.

## Vice- Chairman's Message

As a direct product of Aditya, I know how hard my father worked to put Aditya on the academic map of the country during its many stages of expansion, even in the most trying conditions. My master's degree from UTS Australia, the continent's premier university, has given me a better grasp of the educational system. Aditya technical campus in Surampalem was constructed in the aftermath to provide professional education in engineering, technology, management, and pharmacy, with the underlying principle of excellence and quality. The campus has made rapid growth since its beginning in 2001 by upholding its unwavering dedication to advance knowledge and educate students in science and technology. The campus' main goal is to make teaching and research more relevant to the real world. The ultimate aim of Aditya is to make the campus the 'first stop' for companies in the recruitment process. Keeping in view the demands of the work environment which is beyond just knowledge and marks, a lot of emphasis is laid on the overall personality development of the students.



**Dr. N SATHISH REDDY**  
VICE-CHAIRMAN



## Principal's Message



**Dr. A. Ramesh**  
Principal

The major issues we confront can't be handled at the same level of reasoning that we used to create them." Albert Einstein is credited with coining the phrase "theory of relativity." Man can only achieve immortality through knowledge. To stay relevant, knowledge must extend or grow. The road to excellence is the world's toughest, roughest, and steepest. Only quality is required and rewarded in our world. To develop new knowledge, available information must be directed by wisdom and intellect. Education's new duty is to promote creativity. The only way to address current and future problems and discover dynamic answers is to think creatively. Technology should be used to aid in the eradication of poverty around the world. In truth, India is home to 40% of the world's poor.

Miracles are the result of one's faith in oneself. At ACOE, education aims to develop character, strengthen the mind, broaden the intellect, and foster a culture of problem-solving. The student is placed through rigorous training so that when he leaves the Institute, he can stand on his own two feet.

## HOD Message



**Dr. Y K S Subba Rao**  
HOD, Dept. ME

Mechanical engineering is one of the oldest and broadest engineering discipline, and plays a significant role in enhancing safety, economic vitality, enjoyment and overall quality of life throughout the world.

Mechanical engineers develop state-of-the-art technologies and exhilarating solutions for the mankind. We attempt to provide our students with a cheerful, productive and satisfying experience at all levels of their program of studies to explore the amazing world of mechanical engineering.

Our department has a team of highly qualified and experienced faculty, good infra structure and lab facilities. We are striving hard continuously to improve upon the quality of education and to maintain its position of leadership in engineering and

**Department of Mechanical Engineering**

# VISION

To be recognized as a Centre of Excellence in Mechanical Engineering towards imparting quality education.

# MISSION

The department strives to provide the engineering foundation as well as professional, innovative and leadership, skills to the students through the following activities.

**M1:** Provide the state-of- art facilities.

**M2:** Disseminate knowledge by recruiting qualified and experienced Staff members.

**M3:** Enhance innovative activities by collaborating with industry and Research establishments.

**M4:** Encourage citizenship activities with knowledge and skills.

## PEO's

**PEO1:**The graduates will apply technical knowledge and skills as mechanical engineers to provide optimal solutions in industrial and real-life problems.

**PEO2:**The graduates of mechanical engineering will pursue advanced education, research and development and other innovative efforts in science, engineering and technology, as well as other professional careers.

**PEO3:**The graduates of the program will practice professional and ethical responsibilities including the societal impact of engineering solutions.

**PEO4:**The graduates of the program will practice as leaders in their fields of expertise and in activities that support service and economic development nationally and throughout the world.

## PSO's

**PSO1:**Apply the analytical skills of Mathematics, Basic Science and Mechanical Engineering Streams to formulate, analyze and proved solution to complex engineering problems.

**PSO2:**Design system components or process of Manufacturing, Thermal Engineering Machine Elements and inter-disciplinary fields by applying appropriate techniques to meet the needs of industry and society.



# Index

1. *The Real Life Iron Man-Elon Musk*

2. *Innovation*

3. *Current Issue*

4. *Career Guidance*

5. *Limericks*

6. *From books to Canvas*

7. *Jokes*

8. *Project Idea*

9. *Riddles*

10. *Health*

# THE REAL LIFE IRON MAN

## - ELON MUSK

Elon Musk, (born June 28, 1971, Pretoria, South Africa), South African-born American entrepreneur who cofounded the electronic-payment firm PayPal and formed SpaceX, maker of launch vehicles and spacecraft. He was also one of the first significant investors in, as well as chief executive officer of, the electric car manufacturer Tesla.

### Early Life

Musk was born to a South African father and a Canadian mother. He displayed an early talent for computers and entrepreneurship. At age 12 he created a video game and sold it to a computer magazine. In 1988, after obtaining a Canadian passport, Musk left South Africa because he was unwilling to support apartheid through compulsory military service and because he sought the greater economic opportunities available in the United States.



### PayPal And SpaceX

Musk attended Queen's University in Kingston, Ontario, and in 1992 he transferred to the University of Pennsylvania, Philadelphia, where he received bachelor's degrees in physics and economics in 1995. He enrolled in graduate school in physics at Stanford University in California, but he left after only two days because he felt that the Internet had much more potential to change society than work in physics. That year he founded Zip2, a company that provided maps and business directories to online newspapers. In 1999 Zip2 was bought by the computer manufacturer Compaq for \$307 million, and Musk then founded an online financial services company, X.com, which later became PayPal, which specialized in transferring money online. The online auction eBay bought PayPal in 2002 for \$1.5 billion.

Musk was long convinced that for life to survive, humanity has to become a multiplanet species. However, he was dissatisfied with the great expense of rocket launchers. In 2002 he founded Space Exploration Technologies (SpaceX) to make more affordable rockets. Its first two rockets were the Falcon 1 (first launched in 2006) and the larger Falcon 9 (first launched in 2010), which



were designed to cost much less than competing rockets. A third rocket, the Falcon Heavy (first launched in 2018), was designed to carry 117,000 pounds (53,000 kg) to orbit, nearly twice as much as its largest competitor, the Boeing Company's Delta IV Heavy, for one-third the cost. SpaceX has announced the successor to the Falcon 9 and the Falcon Heavy: the Super Heavy–Starship system. The Super Heavy first stage would be capable of lifting 100,000 kg (220,000 pounds) to low Earth orbit. The payload would be the Starship, a spacecraft designed for providing fast transportation between cities on Earth and building bases on the Moon and Mars. SpaceX also developed the Dragon spacecraft, which carries supplies to the International Space Station (ISS). Dragon can carry as many as seven astronauts, and it had a crewed flight carrying astronauts Doug Hurley and Robert Behnken to the ISS in 2020. Musk sought to reduce the expense of spaceflight by developing a fully reusable rocket that could lift off and return to the



pad it launched from. Beginning in 2012, SpaceX's Grasshopper rocket made several short flights to test such technology. In addition to being CEO of SpaceX, Musk was also chief designer in building the Falcon rockets, Dragon, and Grasshopper.

## Tesla

Musk had long been interested in the possibilities of electric cars, and in 2004 he became one of the major funders of Tesla Motors (later renamed Tesla), an electric car company founded by entrepreneurs Martin Eberhard and Marc Tarpénning. In 2006 Tesla introduced its first car, the Roadster, which could travel 245 miles (394 km) on a single charge. Unlike most previous electric vehicles, which Musk thought were stodgy and uninteresting, it was a sports car that

could go from 0 to 60 miles (97 km) per hour in less than four seconds. In 2010 the company's initial public offering raised about \$226 million. Two years later Tesla introduced the Model S sedan, which was acclaimed by automotive critics for its performance and design. The company won further praise for its Model X luxury SUV, which went on the market in 2015. The Model 3, a less-expensive vehicle, went into production in 2017.

Musk expressed reservations about Tesla being publicly traded, and in August 2018 he made a series of tweets about taking the company private, noting that he had "secured funding." The following month the U.S. Securities and Exchange Commission (SEC) sued Musk for securities fraud, alleging that the tweets were "false and misleading." Shortly thereafter Tesla's board rejected the SEC's proposed settlement, reportedly because Musk had threatened to resign. However, the news sent Tesla stock plummeting, and a harsher deal was ultimately accepted. Its terms included Musk stepping down as chairman for three years, though he was allowed to continue as CEO.

Dissatisfied with the projected cost (\$68 billion) of a high-speed rail system in California, Musk in 2013 proposed an alternate faster system, the Hyperloop, a pneumatic tube in which a pod carrying 28 passengers would travel the 350 miles (560 km) between Los Angeles and San Francisco in 35 minutes at a top speed of 760 miles (1,220 km) per hour, nearly the speed of sound. Musk claimed that the Hyperloop would cost only \$6 billion and that, with the pods departing every two minutes on average, the system could accommodate the six million people who travel that route every year. However, he stated that, between running SpaceX and Tesla, he could not devote time to the Hyperloop's development.

***You have to grow from the inside out. None can teach you, none can make you spiritual. There is no other teacher but your own soul.***



# INNOVATION

## A Brain Activity Measuring Device

*Brain function is known to decrease with age. But just like muscle-strength training, our brain too can maintain and improve brain function regardless of age with proper training.*

Brain training can now be performed by anyone, anywhere and anytime—from maintaining the mental health of the elderly to increasing brain power of professionals who want to improve productivity and school students who want to improve their grades. It can help increase processing speed, memory, decision-making and more.

NeU is a brain science company, founded in 2017 by fusing the cognitive brain science discoveries of Tohoku University with portable brain measurement technologies of Hitachi High Technologies Corp. The company has developed compact and wearable optical topography devices using near infrared spectroscopy (NIRS) technology to measure brain activity in a more user-friendly environment—the devices are not meant for medical use.

XB-01 is an ultra-compact brain activity measuring device weighing thirty grams and measuring 80mm x 40mm x 13mm. It can transfer brain activity data via Bluetooth in real time to any smartphone or tablet. XB-01 includes a built-in battery that lasts up to three hours, USB charging terminal, easy-to-use buttons and switches, a handy holder and designated headband. Brain activity is measured using NIRS technology, and the brain's rate of blood flow change is measured using a weak NIR light.

Six-axis acceleration sensors are built into the main body to detect the head's movement and body movement noise. Combining multiple parameters in addition to measuring brain activity allows XB-01 to create measurement indexes with improved accuracy. Its real-time measurement provides extensive usage in various scenarios, such as movement and cognitive function training, stress coping training, learning and much more.



The device can be used inside the hat of a transport driver or a worksite helmet and so forth, to help prevent accidents and improve work productivity. It enables visualising brain activity during the learning process, thus allowing the learner to objectively know the degree of his/her concentration level. The learner can then modify and make changes to the environment to better enhance concentration and memory abilities.

HOT-2000 is another portable brain activity measurement device that can be used in everyday scenarios. It has the capability to simultaneously measure cerebral blood flow change, heart rate and head acceleration in real time. It can also transmit brain activity data wirelessly through Bluetooth, to be recorded on smartphones and tablets. It is portable and lightweight, weighing only 129 grams. It can start brain activity measurement immediately, right after the individual wears the device.

HOT-2000's sensor portion features a slide mechanism that can be adjusted in the range of 60mm left-to-right. The device can be used continuously for around four hours. With six-axis acceleration sensors, detailed movement of the head can be acquired to analyse body movements. It is intended for use by companies and universities for research purposes. It is compatible with Android OS version 7.0 or higher. It has application software, Measure 3.0 and Analysis 3.0 to analyse brain activity data, including noise processing, blocking and baseline correction. It also edits and saves the measurement design function.

NeU and FOVE have developed an integrated virtual reality (VR) device that can simultaneously acquire brain activity to visualise and quantify a user's interest, concentration and attention in the virtual realm. An objective and quick analysis of data acquired from purchasing and consuming activities of multiple users ensures better products and services.



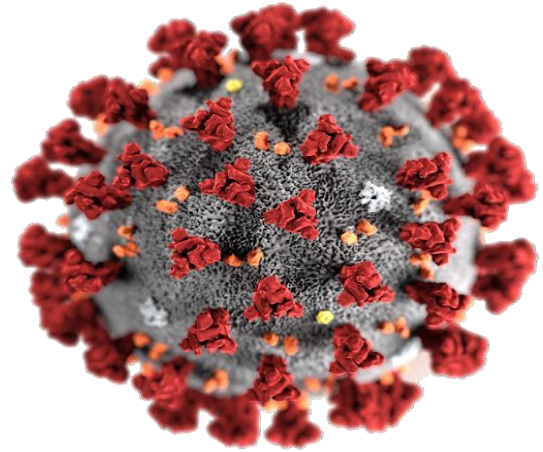
## CURRENT ISSUE

### COVID-19 pandemic in India



The COVID-19 pandemic in India is part of the worldwide pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first case of COVID-19 in India, which originated from China, was reported on 30 January 2020.

On 22 March, India observed a 14-hour voluntary public curfew at the instance of the prime minister Narendra Modi. It was followed by mandatory lockdowns in COVID-19 hotspots and all major cities. Further, on 24 March, the Prime Minister ordered a nationwide lockdown for 21 days, affecting the entire 1.3 billion-person population of India.



### **Government responses**

The outbreak has been declared an epidemic in more than a dozen states and union territories, where provisions of the Epidemic Diseases Act, 1897 have been invoked, leading to the temporary closure of educational and commercial establishments. All tourist visas have been suspended, as a majority of the confirmed cases were mainly imports.

### **January–February**

Protective measures were first applied in January. India began thermal screening of passengers arriving from China on 21 January. Initially carried out at seven airports, it was expanded to 20 airports towards the end of January. During February, the screening was extended to passengers from Thailand, Singapore, Hong Kong, Japan and South Korea. Nepal, Vietnam, Indonesia and Malaysia were added to the list towards the end of February. Very few new cases were discovered during February, The Indian Council of Medical Research (ICMR) admitted that airport screening alone was insufficient.

### **March**

Awareness poster released by the Ministry of Health and Family Welfare

By early to mid-March, the government had drawn up plans to deal with a worsening of the pandemic in the country. This included seven ministries working together to set up additional

quarantine and treatment facilities across the country. States and twenty ministries, including Home, Defence, Railways, Labour, Minority Affairs, Aviation and Tourism, were informed of the containment plan. Plans to avoid a panic-like situation were also made. The Ministry of Textiles was to ensure the availability of protective and medical materials. The Department of Pharmaceuticals was to ensure the availability of essential medicines. The Ministry of Consumer Affairs, Food and Public Distribution was asked to ensure availability of essentials.

On 17 March, the Government of India issued an advisory, urging to all Indian states to take social distancing measures as a preventive strategy for implementation till 31 March. A government directive was issued asking all Central Armed Police Forces to get into battle mode; all non-essential leave was cancelled. A COVID-19 Economic Response Task Force was also formed.

Union and state governments set up national and state helpline numbers.

### **Closedown and curfews**

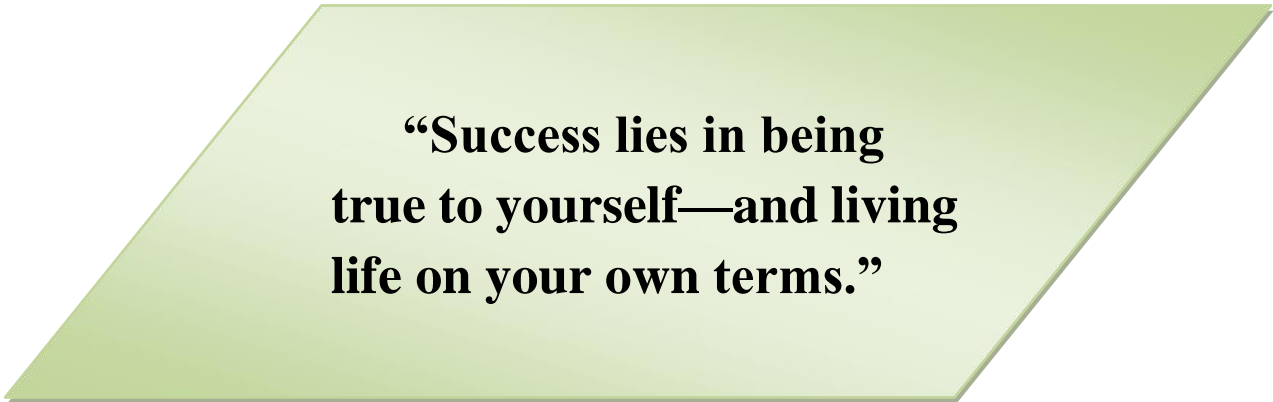
Over the month of March, multiple states across the country began shutting down schools, colleges, public facilities such as malls, gyms, cinema halls and other public places to contain the spread.

- On 15 March, Ministry of Culture closed all monuments and museums under Archaeological Survey of India.
- On 23 March, Chief Minister of Maharashtra ordered a statewide curfew and closure of state borders.

### **Lockdown**

On 22 March, the Government of India announced complete lockdown in 82 districts in 22 states and Union Territories of country where confirmed cases were reported. 80 cities including Delhi, Bengaluru, Chennai, Mumbai, Chandigarh and Kolkata were put under lockdown. Some states sealed their borders barring inter-state movement.

On 24 March, PM Narendra Modi announced a complete 21-day national lockdown to contain the pandemic. By 6 April, the doubling rate had slowed to six days from earlier figure of three day.



**“Success lies in being  
true to yourself—and living  
life on your own terms.”**

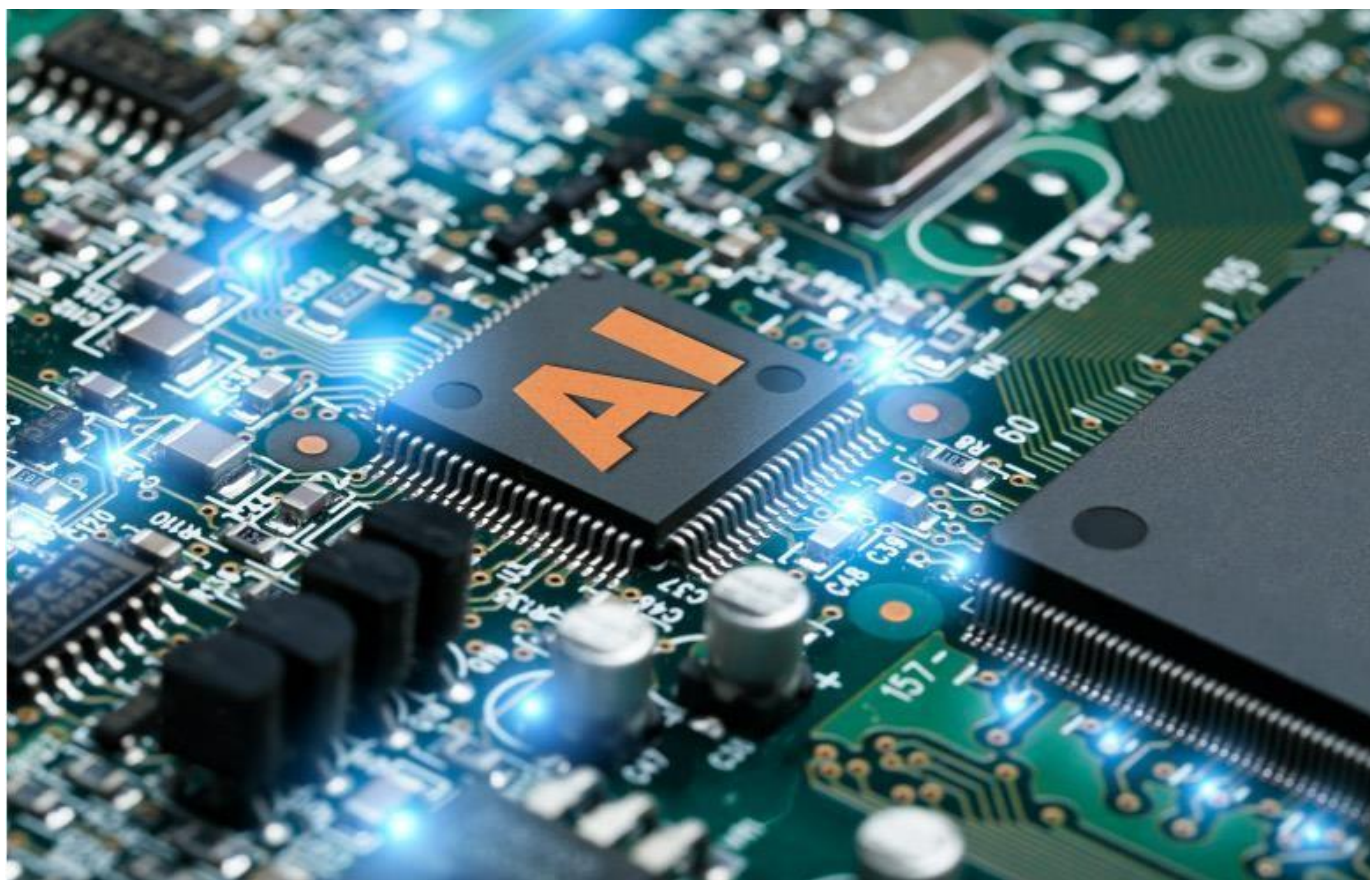


## CAREER GUIDANCE

### **AI is paving the way for the future of the electronics industry**

The electronics industry has a long-standing reputation for innovation. From advancements in computer hardware to smartphones taking over the world by storm, the industry has repeatedly proved itself to be at the forefront of tech adoption. These tech-powered improvements have not only paved the path for disruption in electronics but also turned out to be transformation catalysts for all other industries as well.

Now with the emergence of new breakthrough technologies like IoT and AI, the electronics industry is getting a reboot. Experts believe that it is on the cusp of yet another major revolution and AI is playing a huge role. Incorporating AI is becoming high on the agenda of companies of all sizes here. The technology is transforming businesses across both industrial as well as consumer electronics segment and the results are overwhelming.



## **Electronics industry embraces AI**

Executives in the industry have recognized the importance of AI and are embracing it with open arms. The same was quite evident during the Consumer Electronics Show (CES) 2019 conducted in January. From translator devices to baby monitors and televisions to vests, a number of exciting AI-powered electronics devices were showcased at the event.

*Samsung announced that artificial intelligence capabilities would be a part of every device it manufactures by 2020.*

However, companies are not just adding AI capabilities to their devices but using this futuristic technology in processors as well. AI-enabled electronics manufacturing is on the rise and industry leaders are definitely the front-runners here. Companies like Intel, Google, Apple, Samsung and many others have developed or are in the process of developing AI-powered processors and chips.

## **AI strategy and planning workshop**

Artificial intelligence is transformational, and adopting this technology will enable companies to reshape their strategic vision so that they no longer rely on what they think is true, rather, leverage factual-based decision-making capabilities.

Areas where AI is proving useful for the electronics industry

The possibilities of using AI in electronics are endless and it will be interesting to see the various areas in which companies will incorporate AI in the near future. For now, we will be discussing the three areas where it has a major impact currently:

### **R&D**

Leading electronics equipment manufacturers like Samsung, Mitsubishi, and Hitachi are using AI to carry out advanced research. These companies are making long-term investments in AI research to find commercial applications and to explore how this technology can help to improve their existing product range. The research focuses on machine vision, voice recognition, audio processing and other key areas related to AI. Through these R&D programs, organizations try to have a better understanding of the usage context, user behavior, their preference and needs.

### **Manufacturing**

We have already discussed above, how companies are manufacturing transformative AI-powered electronics devices that benefit other industries. However, the use of AI is not just limited to this area of manufacturing. The industry is also using AI to reshape product development cycles, improve product design processes, reduce defects and deliver products faster to the market.

AI-enabled electronics manufacturing helps companies to create agile workflows for the rapid development of the next line of products. They combine and collect anonymized data from various sources like sensors attached to the products, customer usage patterns, current market scenario, audio and video files, technician comments, device manuals and more. This helps to generate key insights through which electronic companies are able to improve product quality, reduce costs and answer to market demands in a more efficient manner.

## Insights

Cognitive AI - Harness the power of intelligent technologies

Modern enterprises own a huge volume of structured and unstructured data like never before. This data is gathered from emails, manuals, documents, social media posts, videos, images, audio recordings, customer feedback, industry reports and more.

## Security

As electronic companies manufacture more smart and connected devices for industry, home and consumer use, they need to ensure the security of these devices as well. More connected devices mean more opportunity for cybercriminals. With AI, manufacturers are adding in-built security options for these connected devices and making them more secure than ever.

The ability of AI to study traffic patterns, baseline performance and user behavior as well as identify anomalies in real-time, make it beneficial for use in this critical area of business. Not only AI-powered security systems, baby monitors, webcams and facial recognition systems are improving security in general, the electronics industry is also using this technology to safeguard these devices against any infiltration, vulnerability and attack.

Putting AI to work in electronics

The growth of AI is quite evident in the electronics industry. Organizations that have not begun their journey yet should immediately start to put this technology to work for their benefit. It has immense potential to improve product, processes and services in this industry and several companies are using it as well. Let's see the two major ways electronic manufacturers are using AI.

Electronic device manufactures can use AI to create smarter devices and maximize their functionalities. For example, AI-powered TVs can help to automate on/off settings, volume, picture mode and several other key parameters to ensure that viewers can operate the TV easily. Moreover, by using techniques like face recognition and personalized recommendations, it also promises to make the viewing experience more personal.

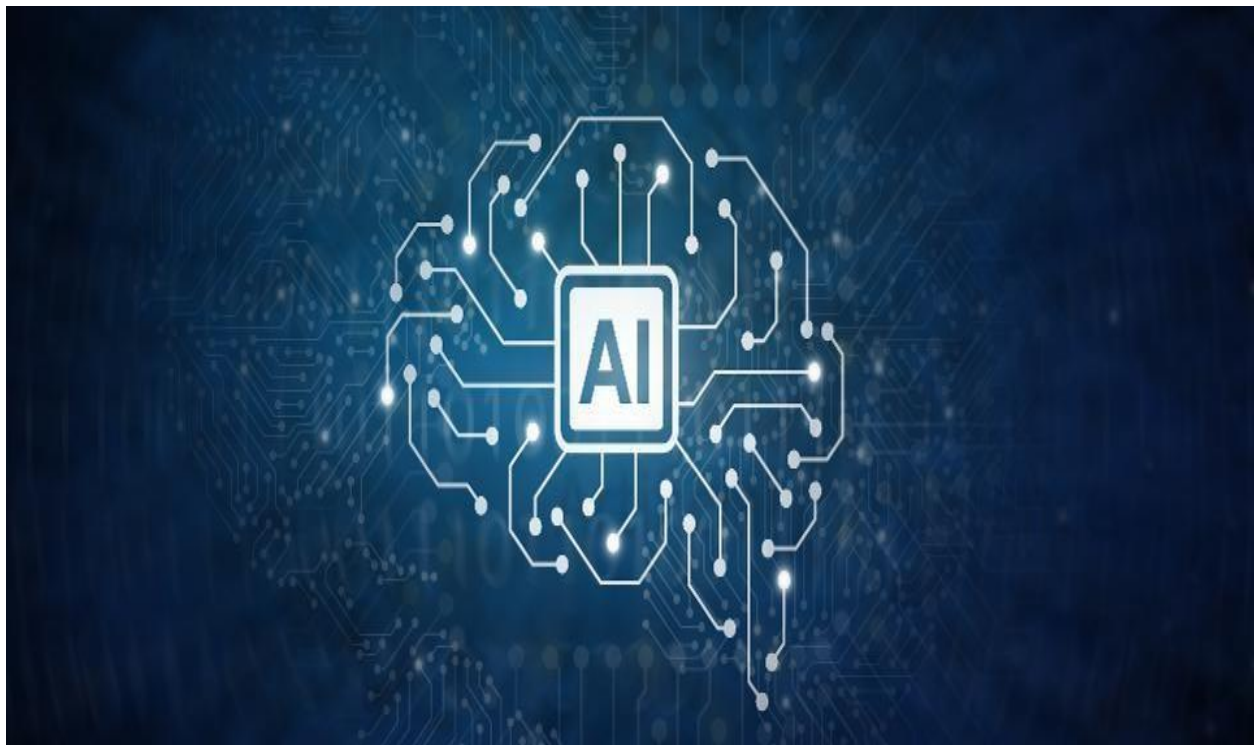
*According to IBM's research, 41% of electronics companies are launching or modifying new business models in the next two to three years. Data and AI enable this huge transition.*



The other way is to use AI in electronics operations and rethink their business processes keeping the technology in mind. Companies can develop a comprehensive AI strategy to harness its potential in making their business models more predictive and adaptive to an ever-changing business environment as well as to expand their organization's knowledge. Having an AI-powered business strategy will help electronic manufacturers in creating a strong foundation for building innovative electronic devices for the future.

### **IT IS NEVER TOO LATE TO START**

It is time for you to consider using AI-enabled electronics manufacturing and create a roadmap for it. If you have any confusion or questions around harnessing this technology, then contact our AI experts. We can accelerate your roadmap to AI and help you achieve your goals.



## LIMERICKS

1. *“Life has bigger plans for you than you can possibly know.”*
2. *“A burning sense of passion is the most potent fuel for your dreams.”*
3. *“Certain things. It comes when you think certain”*
4. *“The best antidote for fear is knowledge.”*
5. *“Remarkable people are priority-driven. This is the secret of time mastery. Build your days around your priorities and you will play in rare air.”*
6. *“It’s better to be a lion for a day than a sheep all your life.”*

# FROM BOOKS TO CANVAS



S Santhosh





“Art enables us to find ourselves  
and lose ourselves at the same  
time.”

## JOKES

“Sherlock Holmes and Dr Watson go on a camping trip. After a good dinner and a bottle of wine, they retire for the night, and go to sleep. Some hours later, Holmes wakes up and nudges his faithful friend. "Watson, look up at the sky and tell me what you see." "I see millions and millions of stars, Holmes" replies Watson. "And what do you deduce from that?" Watson ponders for a minute. "Well, Astronomically, it tells me that there are millions of galaxies and potentially billions of planets. Astrologically, I observe that Saturn is in Leo. Horologically, I deduce that the time is approximately a quarter past three. Meteorologically, I suspect that we will have a beautiful day tomorrow. Theologically, I can see that God is all powerful, and that we are a small and insignificant part of the universe." But what does it tell you, Holmes?" Holmes is silent for a moment. "Watson, you idiot!" he says. "Someone has stolen our tent!"”

**A man tells his doctor, “Doc, help me. I’m addicted to Twitter!”**

The doctor replies, “Sorry, I don’t follow you...”

## PROJECT IDEA

### KINECT WIFI ROBOT ARM

#### Absrtact:

This research work is targeted at building and analysing a robotic arm which mimics the motion of the human arm of the user. The proposed system monitors the motion of the user's arm using a Kinect. Using the "Kinect Skeletal Image" project of Kinect SDK, a skeletal image of the arm is obtained which consists of 3 joints and links connecting them. 3-D Coordinate Geometry techniques are used to compute the angles obtained between the links. This corresponds to the angles made by the different segments of the human arm. In this work we present the capturing of human hand gestures by Kinect and analysing it with suitable algorithms to identify the joints and Angles. Also the Arduino based microcontroller used for processing Kinect data is presented.

Robots are quickly becoming more integrated into our day-to-day lives. They clean our floors, make our coffee, and are even used for tele presence.

Since they are becoming so vital to society, why not give our robotic companions the gift of vision? In this Project, we will show you how to use the Microsoft Kinect to provide three-dimensional vision and depth to a robotic arm, in order to assist in the automation of basictasks.

#### Arduino Uno is a microcontroller board

Arduino Uno is a microcontroller board based on the ATmega328P . It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.





### Specifications

Microcontroller	ATmega328P
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limit)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
PWM Digital I/O Pins	6
Analog Input Pins	6
DC Current per I/O Pin	20 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328P)

	of which 0.5 KB used by bootload* <sup>r</sup>
SRAM	2 KB (ATmega328P)
EEPROM	1 KB (ATmega328P)
Clock Speed	16 MHz
Length	68.6 mm
Width	53.4 mm
Weight	25 g

### Working Principle:

The robot arms can be autonomous or controlled manually. In manual mode, a trained operator (programmer) typically uses a portable control device (a teach pendant) to teach a robot to do its task manually. Robot speeds during these programming sessions are slow. In the current work we enclosed the both modes. The control for the presented robot arm consists basically of three levels: a microcontroller, a driver, and a computer based user interface. This system has unique characteristics that allow flexibility in programming and controlling method, which was implemented using inverse kinematics; besides it could also be implemented in a full manual mode. The electronic design of control is shown in Figure 11. The microcontroller used is an Atmega 368p which comes with a development/programming board named —Arduinol, as shown in Figure 12.

The programming language is very similar to C but includes several libraries that help in the control of the I/O ports, timers, and serial communication. This microcontroller was chosen because it has a low price, it is very easy to reprogram, the programming language is simple, and interrupts are available for this particular chip. The driver used is a eight .channel for servo controller board. It supports tow control methods: Bluetooth for direct connection to an android device or direct control using variable resistors.

## **Conclusion:**

The main focus of this work was to design, and programme robotic arm the robot arm was designed with five degrees of freedom and talented to accomplish accurately simple tasks, such as light material handling the robot arm is equipped with several servo motors which do links between arms and perform arm movements. A microcontroller that drives the servo motors with the capability of modifying position The programming is done on ATMEGA-328p Microcontroller using Arduino programming.

The potentiometers are also used to detect the angle of rotation and the signals are then sent to the microcontroller. And you can control the robotic arm also using android device, in today's world, this Robotic arm has turned out very benevolent. Besides Robotics and Automation, these kinds of arms have applications in other fields also.





# RIDDLES

**1. What word would you use to describe a man who does not have all his fingers on one hand?**

A. Normal, because people usually have half their fingers on one hand.

**2. If you have one, you want to share it. But once you share it, you do not have it. What is it?**

A. secret

**3. If you have a bowl with six apples and you take away four, how many do you have?**

A. The four you took

**4. What will you actually find at the end of every rainbow?**

A. The letter 'W'

**5. Some months have 31 days, others have 30 days, but how many have 28 days?**

A. All 12

**6. Imagine you're in a room that's filling up with water quickly. There are no windows or doors. How do you get out?**

A. Stop imagining

## HEALTH

# HOW TO PROTECT YOURSELF & OTHERS

Since the December 2019 outbreak in Wuhan, China, the new coronavirus has spread rapidly. According to the Centers for Disease Control and Prevention (CDC), the virus that causes the disease known as COVID-19 seems to be spreading in the community in certain affected geographic areas. As with any virus, however, there are simple steps you can take to protect yourself.

### Know the signs

The symptoms of infection for the new coronavirus are often similar to those of other respiratory virus infections, such as influenza. Symptoms can include fever, cough, or shortness of breath. Most people will only have mild symptoms, but some can become very sick. When person-to-person spread has occurred with other novel coronaviruses that caused diseases such as Middle East Respiratory Syndrome (MERS), it is thought to have happened mainly via respiratory droplets produced when an infected person coughs or sneezes, similar to how influenza and other respiratory pathogens spread. Spread of MERS and SARS has generally occurred between people in close contact.

“The means of transmission is similar: through respiratory droplets produced when a person coughs or sneezes, or by direct physical contact with an infected person, such as shaking hands,” says Dr. David Goldberg, internist and infectious disease specialist at NewYork-Presbyterian Medical Group Westchester and an assistant professor of medicine at Columbia University Vagelos College of Physicians and Surgeons.

If you think you may have been exposed to a person with COVID-19 and have symptoms, before going to a doctor’s office or emergency room, call ahead and tell them about your symptoms and any recent travel. You can also utilize a virtual care platform, such as NewYork-Presbyterian’s NYP OnDemand, to meet with a healthcare professional by video conference. Depending on the severity of your symptoms, your doctor will determine whether or not you need to come in to be evaluated. Avoid contact with others and wear a face mask if you need to leave your home when you are sick.

How contagious is the new coronavirus? A person infected with the new coronavirus can spread the virus to 1.5 – 3.5 people. This metric, known as the R0 or R-naught, describes how



contagious a virus is. Here, we show how quickly the new coronavirus can jump from 1 infection to over 1 million.

#### Keep things clean

Preventative measures are your first line of defense. The best way to protect yourself from COVID-19 is to practice good hygiene and to make these CDC recommendations part of your routine:

- Wash your hands often with soap and water for at least 20 seconds, especially after going to the bathroom; before eating; and after blowing your nose, coughing, or sneezing.
- If soap and water are not readily available, use an alcohol-based hand sanitizer with at least 60% alcohol. Always wash hands with soap and water if hands are visibly dirty.
- Avoid touching your eyes, nose, and mouth with unwashed hands.
- Avoid close contact with people who are sick.
- Stay home when you are sick.
- Cover your cough or sneeze with a tissue, then throw the tissue in the trash and wash your hands. If you don't have a tissue, cough or sneeze into your elbow, rather than into your hands.
- Clean and disinfect frequently touched objects and surfaces.

Visit the CDC for guidelines on how to properly wash your hands and use hand sanitizer. (Yes, there's plenty of science behind this basic habit.)

#### Wear a cloth face mask

On April 3, the CDC changed its guidelines on face masks, recommending that people wear cloth face coverings in public settings. This is especially encouraged in situations where social distancing is difficult to maintain (such as in a grocery store or pharmacy) and in areas of significant community-based transmission. According to the CDC, studies have shown that individuals with the novel coronavirus could be asymptomatic or pre-symptomatic, prompting them to make this new recommendation. While this measure is intended to help mitigate the spread, it's important to note that it does not replace social distancing recommendations. In addition, surgical masks and N-95 respirators should remain reserved for healthcare workers and medical first responders.

#### Avoid close contact

Social distancing remains a key way to mitigate spread. The CDC recommends maintaining a distance of approximately 6 feet from others in public places since respiratory droplets produced

by coughing or sneezing do not travel more than 6 feet. While at home, remind everyone to practice everyday preventive actions – such as washing hands and wiping down surfaces – to help reduce the risk of getting sick. If you are symptomatic and have tested positive for COVID-19 but do not require hospitalization, you should stay in a specific “sick room” and away from other people in your home as much as possible and use a separate bathroom, if available. If your living space makes it difficult to keep a 6-foot distance, stay as far apart as you can and continue to practice good hygiene and wear a mask.

**Restrict your travel**

Traveling can help increase the spread of COVID-19 and put you at risk for contracting the disease. The CDC recommends avoiding all non-essential international travel due to the global spread of coronavirus. It also advises people to weigh the risks when it comes to domestic travel: “COVID-19 cases and deaths have been reported in all 50 states, and the situation is constantly changing,” states the CDC. “Because travel increases your chances of getting infected and spreading COVID-19, staying home is the best way to protect yourself and others from getting sick.”

“For people at risk for the complications of COVID-19, such as those with underlying medical conditions or those who are older, it’s prudent to avoid travel,” says Dr. Goldberg.

If you must travel, take safety measures, consider your mode of transportation, and stay up to date on the restrictions that are in place at your destination.



## FACULTY ARTICLE

# **To Be a Truly Effective Teacher: Learn Something that is Difficult for You**



I have been teaching various levels of reading skills and composition to native and non-native speakers, to immigrants and U.S. citizens, to people with talent and interest, and I have one thing to say:

In order to teach well, you need to learn something that does not come easy.

We need to be able to teach *all* of our students. Our students come to us with various levels of interest in actually attending our class. Some are confident about their fluency and ability in the subject matter and are ready to jump in. Usually, I find those that are eager to engage are easiest and

most enjoyable to teach. However, some of my students are not in that space of confident curiosity, and even sitting in my class arms folded, head down, is an exercise in vulnerability.

What must that feel like? Do you remember?

Many of us can understand that level of vulnerability intellectually by reading about teaching. We have read many articles on how to engage both students who are labeled, either by us or others, as “successful” students and “at-risk” students. However, in order to truly understand it, we need to experience it.

In our undergraduate experience, most of us took a class or two that was not part of our skill set. Maybe we remember those moments, and maybe we don’t. Maybe those moments were years ago.

To continue to be effective teachers, in addition to reading, writing, and researching about teaching, we also need to put ourselves in learning situations where we are not sure if we will be successful. Continually, coming in contact with our own vulnerability and failure will shape our teaching with empathy and other communication skills that we can use to reach students that are harder to engage with.

For many of us, in our classrooms, we teach a subject that comes easy to us, or at least a subject matter with which we are now some level of expert as we read, write, and research that area.

How would it be to sit in a classroom where you are not known as a teacher, an “intellectual,” or a “good student” and try to learn something that you are not sure you can?

How would that experience impact you? Your teaching?

For me, it impacts me dramatically. Because many of my students are non-native speakers of English and are learning, speaking, and communicating at a college level in a language that is not their mother tongue, I decided that I, too, would work at learning languages.

I chose Spanish for its beauty and practicality—for many of my students their first language is Spanish—and Russian because it, for me anyways, is truly difficult with its Cyrillic alphabet and culture that for many reasons has been mystified and at times vilified by American culture.

Sitting in a classroom in another country has taught me so much about the “fish out of water” feeling that I know my students must routinely have.

I had the nervousness of finding the school—is this the right corner to turn left? Is this the correct bus? I experienced being hungry but nothing that was offered tasted right, and nothing really fed me in a way that food from home did. I sat in a class and was completely mystified by what the teacher was saying and what I was supposed to do with what appeared to be instructions. I looked around and saw other students seemingly understand. What did this mean? What was I doing here? I worked for hours on homework only to be told what I did wasn’t quite the assignment. I got so hungry in the middle of a lesson that I thought I was going to faint. I couldn’t find the bathroom and was too shy to ask. I wore the wrong shoes and had blisters on my feet that made it hard to do anything but sit. I just wanted to hide.

**What I learned:**

- Things that I think are intuitive probably aren’t for some of my students. To accommodate this, I try to over explain and explain using as many mediums as possible.
- I try to be approachable. It’s scary not to know, and it’s scary to ask for help. Those two facts of living make it hard for our most vulnerable students to ask questions.
- I walk students to the bathroom, to the library, to the academic success center, to the water fountain. Students have probably been shown these things once and feel “dumb” because they have forgotten. However, being in a new situation where everything is new means you don’t retain everything because your brain is on overdrive. Yes, my hosts told me which numbered busses would get me to school, but do you think I remembered them all? No. Probably because they also showed me the grocery store, the market, and which corner to turn on to get to the school all at once. Something was going to give.

This is also true for our students, and although I knew this in my head before experiencing it; I had read the brain research that talked about retention, nerves, and new things.

But after experiencing it, there is a way I walk with my students. I understand in my bones what it is like to board a bus in an unfamiliar city, hope you are on the right one, and be too tired to form the question to ask in a new language. I know what it’s like to walk across the threshold to a classroom and be unsure if you belong, or even if you even want to be there.

From these experiences, there is now a kinder way that I tell my students something I have already told them three times. I realize that they don't remember, not because they weren't listening the first three times, but because even when they were listening, it didn't stick.

There is a way I talk to the student whose project is completely different from the expectations of the assignment. This student isn't trying to get away with something, and they were probably listening when I explained it. In other words: everyone was doing everything "right" and still here we are. There's a quality of gentleness and respect one uses with someone who you think has been doing something right and still ends up with more work to do.

And yes, I have read what new students need and what students who come from different languages and cultures need in order to be successful in a different classroom, but when *I* was the new student, and was the one who was scared, the one who still didn't quite understand after the third explanation, it lands not only in my head, but in my heart.

And truly, that's where the best teaching happens, isn't it? When the head and heart are married, and we push through our exhaustion to explain something one more time to another human being.



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