



Vidya Vikas Education Trust's
UNIVERSAL COLLEGE OF ENGINEERING

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NAAC B+

#ASHTAG

THE CATERPILLAR HAS TO
SUFFER SILENTLY IN A COCOON
IN ORDER TO BECOME A
BUTTERFLY

CHANGE IS PAINFUL IN THE
BEGINNING BUT WORTH IT IN
THE END

JAYKARAN SAGAR

APPLIED SCIENCE AND HUMANITIES DEPARTMENT

VISION

The Department of Applied Science and Humanities is committed to dynamically integrate the components of Science, Humanities and Engineering to groom students to transform them as globally acknowledged professionals.

MISSION

The department is carrying a mission to create and disseminate the knowledge and techniques in intellectual areas of Engineering and other core areas of Applied Science and Humanities for betterment of Eco system.

To inculcate the importance of Applied Science and develop a natural flair for Engineering and Technology which in turn shall mold students into a competent professional.

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

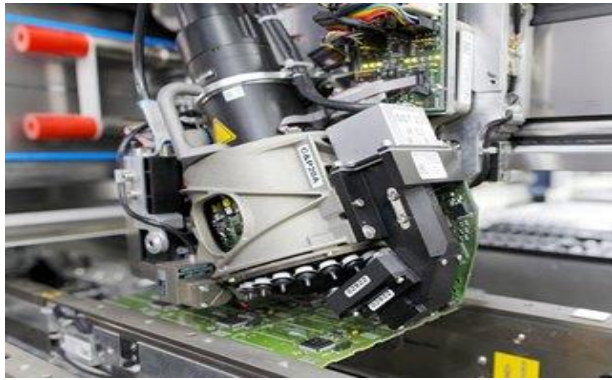
7 Biggest Trends for in the 2020s

In February 2020 the world celebrated the first Engineering Week of the 2020s and looked at this new decade as an opportunity to look forward. But instead of focusing on individual technologies—robots, additive manufacturing, Industry 4.0, and artificial intelligence—the top seven implications of some of these advances over the next ten years has been considered in this article.

In the field of Engineering

1. Autonomy Everywhere

Artificial intelligence is likely to define the coming decade. It has already begun to increase its footprint in engineering software, where generative design applications automatically optimize CAD designs to best fit the



functional definition of a part—including how it will be manufactured.

AI shows up increasingly in autonomous systems. These include vehicles and drones, as well as robots that route parts in factories and warehouses (and which may one day replace conveyor belts), and robots that deliver drugs and supplies in hospitals. AI makes possible a vast range of sophisticated products that respond autonomously to their environment or spoken commands.

2. More and Better Big Data

Everyone has heard the term “big data” by now, but most applications run on a relative trickle of data limited to a machine, a factory, or feedback from a fleet of products in the field. That is changing rapidly, thanks to the growing proliferation of internet of things (IoT) sensors that make it easier and easier to collect real-time information. Add to those 5G wireless networks, which promise to not only boost data transmission speeds by factors of five to hundred but have much lower latency rates than existing 4G networks.

Higher speeds and low latency make it possible to do things in real time that are unthinkable now. They could enable applications to track the location of autonomous vehicles and control their speed and location to optimize citywide traffic. Or they could optimize the utilization of factory equipment and tasks over a wireless network.

3. Plug-and-Play World

Today, technologies like AI, IoT, big data, 5G, autonomous robots, and blockchain are stand-alone solutions. It is no small task to ensure a variety of IoT sensors can speak with a manufacturing execution system, which is in turn able to talk with a cloud-based data analytics package. That leaves producers with two choices: They can either find a vendor who packages all these capabilities together, though this may lock them into a single and often expensive proprietary system. Or, if they want to mix and match best-of-class applications, they must pay programmers to integrate devices and software, so data formats are compatible up and down the system.



4. More Complex Products

People want more out of their products and information technology delivers those capabilities. Automobiles are the best example of this trend. Look beyond consumer features, such as voice-controlled phones and music systems or internet hubs, and consider safety systems.

This trend to automate will spread to other products—robots, manufacturing equipment, design software, consumer products—as we create systems to translate human intent into action. Such intuitively obvious systems will seem simple to users, but present steep challenges for engineers. Those who build them must ensure they are safe for all use cases, and then find ways to test these increasingly complex products.

5. Old Industries Are New Again

“Disruption” is an overused term that can cause brain shutdown, but information technology gives engineers a way to make once-staid products new again. Take, for example, automotive. Ten years ago, who would have imagined that an upstart company like Tesla would be selling upwards of 100,000 cars per quarter and have a stock valuation higher than Toyota, Daimler, or GM? Or that fast-moving private companies like Space X, Blue Origin, Relativity Space and others would challenge established giants like Lockheed, Orbital, and Arianespace in launch vehicles?

Today, startups can start with a shopping cart full of off-the-shelf sensors and mechanical parts, add drop-in AI robot operating system (ROS), sensing, and

mapping software, and they are ready to begin development. This explains why there are now literally hundreds of companies launching autonomous robots for niche applications ranging from heat exchanger cleaning to hospital drug dispensing. Look for even more disruption—and opportunities—in other fields as AI gets cheaper and more standardized.

6. Resilient Systems

Complexity is inherently unstable. That makes sense, because the more degrees of freedom in a system, the greater the chance that something will go wrong. This applies equally to global supply chains, factory complexes, telecommunications systems, and the electrical grid, which is growing even more complicated as it stretches to accommodate such intermittent sources of green power as solar and wind.

Two factors compound these inherent instabilities. The first is a changing climate that makes severe weather events more likely. This puts infrastructure and all types of facilities at risk from flooding and wind damage. The second is the breakdown of the trade treaties and alliances that threatens global supply chains. Engineers will increasingly have to take the potential for disruption into their plans.

7. A Changing Profession

Mechanical engineers must collaborate with electrical and electronic engineers to add embedded capabilities, manufacturing engineers to optimize product design, and professionals in purchasing and marketing to ensure the product meets cost, service, and functional goals. This is making the design more democratic, but it may also erode an engineer's sense of personal responsibility.

All this is taking place against a backdrop of post-recession companies still running very lean engineering teams. During the recession, companies reduced staff and many moved engineering work to less costly nations overseas. That is not likely to reverse. Instead, during the new decade, corporations are likely to supplement their engineers with AI-driven software tools to seek greater productivity. While today's engineers are increasingly pressed, younger engineers are also in a position to take big strides in responsibilities and salaries as the Baby Boomers retire.

by Alan S. Brown

Source: <https://www.asme.org/topics-resources/content/7-biggest-trends-for-engineering-in-the-2020s>

In the Field of Transportation

Here are seven examples of these recent engineering innovations:

1. Smart Bicycles

The first bicycle was built in 1817. Although the base design is still fairly standard, engineers continue to experiment with new designs and materials, including high-tech electronic controls.

Researchers in China have developed an autonomous bicycle that can respond to voice commands due to a neuromorphic chip. This chip includes hundreds of thousands of sensors that help the bike recognize voice commands, avoid obstacles, and maintain balance.



2. Maglev Trains

Top news for trains is China's new maglev train that is designed to carry passengers at speeds up to 370 mph, more than 150 mph faster than the world's fastest passenger trains now in operation.

These maglevs (short for "magnetic levitation") also produce less noise and vibration, making life easier for people living near train tracks, as well as passengers and crew members.

3. Multi-Directional Elevators

German elevator manufacturer Thyssen Krupp is developing the world's first rope-less and sideways-moving elevator system.

Instead of the traditional cabin moving up and down a vertical shaft, the new system consists of multiple cabins that operate on an electromagnetic track. Using the principles of magnetic levitation, the cabins move up one shaft, travel horizontally, and descend another shaft, creating a continuous loop.

4. Next-Generation Lithium-Ion Batteries

Many, if not most, major automobile manufacturers have invested in electric-powered or hybrid vehicles. Even with the higher cost and limited range, consumers buy electric vehicles because they are less expensive to operate and better for the environment.

However, the limitations of lithium-ion batteries (energy density, safety) must be overcome before electric cars gain significant market share. So, researchers are looking at ways to improve battery structure and electrode chemistry for batteries to hold more charge for a longer time.

5. Safer Autonomous Navigation

Rapid advances in computer technologies have accelerated the design and production of autonomous cars. Safety remains a top concern—most of these vehicles can navigate and monitor the environment on their own, but still require a human driver.

A new study at the University of Cambridge found that when driverless cars communicate with each other on the road and drive cooperatively, they create safer driving conditions by sharing obstacles alerts with each other and creating openings for other cars that need to switch lanes, improving traffic flow by up to 45 percent.

6. Enhanced Drones

Drone technology continues to advance rapidly, especially research and development on durable and lightweight materials, payload capacities, battery power, quieter operation, georeferencing tools, and sophisticated yet easy-to-use software that monitor flights in real-time and analyzes flight data. These enhanced capabilities expand the ways drones can be used.



7. Hypersonic Air Travel

It has been 16 years since the Concorde Supersonic airliner took its last flight, flying faster than the speed of sound (Mach 1, or 770 mph). Now, a new generation of aviation companies hopes to be flying passengers at hypersonic speeds of Mach 5 (3,800 mph), or even higher, sometime in the near future. Such aircraft would complete the transatlantic New York City to London journey in about two hours.

by Mark Crawford

Source: <https://www.asme.org/topics-resources/content/7-top-trends-in-transportation-technology>

Contributed by Mr. Aniket Patil

The most useful tools every programmer should have

Every trade has its tools and software development is no different. A BTech computer science programmer or software developer generally know their tools better than others. They also have access to more powerful and advanced tools than an average programmer. But there are certain tools that individuals expect every software developer should know.

Git and Github In today's world, Git and Github have become synonymous with the source control repository and version control tool. This is the single most significant tool for a programmer now and that is why every programmer learns Git and Github truly well.

SQL This is another essential tool or Programming Language every programmer should learn. SQL stands for Standard Query language and used to work with the database.

Python Students Engineering Colleges might be surprised to know that every programmer learns Python. Python is a powerful high-level, object-oriented programming language which is very versatile. They can create big applications like Java and Python to create useful scripts to automate stuff.

Excel Microsoft Excel is another essential tool for programmers and software developers. The biggest reason to learn Microsoft Excel is that individuals will find it everywhere. Everybody uses it, starting from business to BA, QA and project managers. They can use it to generate reports, automate and reconcile stuff and a lot more.

Word Microsoft Word is not as popular as Microsoft Excel but still, it is one of the essential tools for programmers and software engineers of Engineering Colleges.. As a developer, students often need to create documents. For instance, software design documents, requirement documents etc and Microsoft Word is the best tool for

that. It provides sophisticated formatting options to create good looking documentation.

In conclusion, there are some essential tools for every programmer. Good knowledge of these tools goes a long way in your software development career. Individuals will use these tools every day and appreciate the time and effort they put initially to learn them.

Contributed by Mr. Aniket Patil

Congratulations !!!



Kudos to Ms Marina Thomas for clearing the National Eligibility Test(NET), an exam conducted to determine the eligibility for the post of Assistant professor and/or Junior Research fellowship award in Indian universities and colleges. The First Year faculty members wish her a Hearty Congratulations and a bright future ahead.

Edited and Compiled by Marina Thomas

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