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Dept. of ECE Magazine, Volume - 6, Issue 3

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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MINDTRONICS

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Focus & Scope:

A department magazine encourages the students to think, present and draft that help them in developing their talent, technical and writing skills. Also it helps them to improve their power of thinking and strengthen their imagination. Our department magazine MINDTRONICS consists of Articles on Emerging Developments in Electronics, Cartoons, Poetry, Drawings and Review Writings on Latest Happenings collected from department students.

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Foreword

Electronics and Communication Engineering (ECE) involves researching, designing, developing, and testing electronic equipment used in several engineering systems. It gave me great satisfaction to know that the Department of Electronics and Communication Engineering has come up with its own magazine, "Mindtronics". The way they presented it was unique, very creative and hope it will serve as a motivational and technological source for the students to exhibit their inherent talents and improve their skills. I'd like to express my appreciation to the whole team members of Mindtronics including Faculty Coordinators who really made it possible.

Dr. K. Appa Rao,
Principal

Dr. Y. Amar Babu,
Proffesor & Head, ECE

The branch ELECTRONICS stands for "Ever Learning, Ever Creative Through Research Onsetting New Inventions Comforting Society". The Department of ECE's magazine, "TechConnect," recently revised as "Mindtronics," that has been a source where members of the department are invoked to share their ideas, talents which includes technical, general aspects, and I strongly believe it is a wonderful platform to showcase their creative skills. I appreciate the entire students' team of Mindtronics for their efforts and hard work that they put in to bring out this edition. I extend my sincere thanks to Faculty Coordinators for their fabulous guidance. I hope this magazine gets strengthened further in all aspects to improve the overall skillset of students.

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Category -I

EMERGING DEVELOPMENTS IN ELECTRONICS

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. FLEXPOD XCS

Cisco and NetApp offer full stack visibility and automation across environments with FlexPodXCS. Cisco and NetApp have teamed up to offer FlexPod XCS, which features new capabilities designed to keep data centers running optimally with less IT management oversight and lower costs overall. Application is Hybrid Cloud. Used technology is also a hybrid cloud.

Cisco and NetApp have teamed up to offer FlexPod XCS, which features new capabilities designed to keep data centers running optimally with less IT management oversight and lower costs overall. The system helps createautomation for modern apps and services across on-prem data centers, cloud environments and the edge.

FlexPod product marketing specialist Bruno Messina recently announced the general availability of FlexPod XCSon the NetApp blog calling it “the first installment in bothfull-stack visibility and automation and single pane of glassmanagement for FlexPod customers. ”Messina also notes that FlexPod XCS will continue to increase in value to customers over time as new features and automation building blocks are added to the development cycle. Through its integration with the Cisco Inter sight cloud opsplatform, Flex Pod XCS can catalog all FlexPod assets, including on-premises installations and those installed around the globe. This enhanced visibility allows clients to streamline planning, save time, reduce costs and increaseaccuracy.

FlexPod’s deep visibility also extends to NetApp storage. Customers can quickly survey vital information, including volumes, ONTAP versions, virtual machines, nodes, disks and ports. With these tools, admins can more quickly andefficiently assess platform health, metrics and available capacity from a single point of monitoring. Automation is a marquee

component of FlexPod XCS. Automating important tasks takes the pressure off system administrators and can bring greater efficiency to data center operations. For example, end-to-end automation can accelerate deployment times, simplify daily operations and streamline infrastructure lifecycle management .Among the many possibilities automation brings to the table, Messina notes some of the most powerful.

NetApp storage orchestration combined with VMware virtualization tasks such as setting up storage virtual machines, logical interfaces and volumes using reference workflows

Employing out-of-the-box workflows

Creating and editing customized workflows and tasks

To find out more about how the FlexPod platform can help you and your customers streamline operations and lowercosts.

By
N.Harshitha
20761A04G8

CAN YOU TRY THESE….!?

- Peter Piper picked a peck of pickled peppers

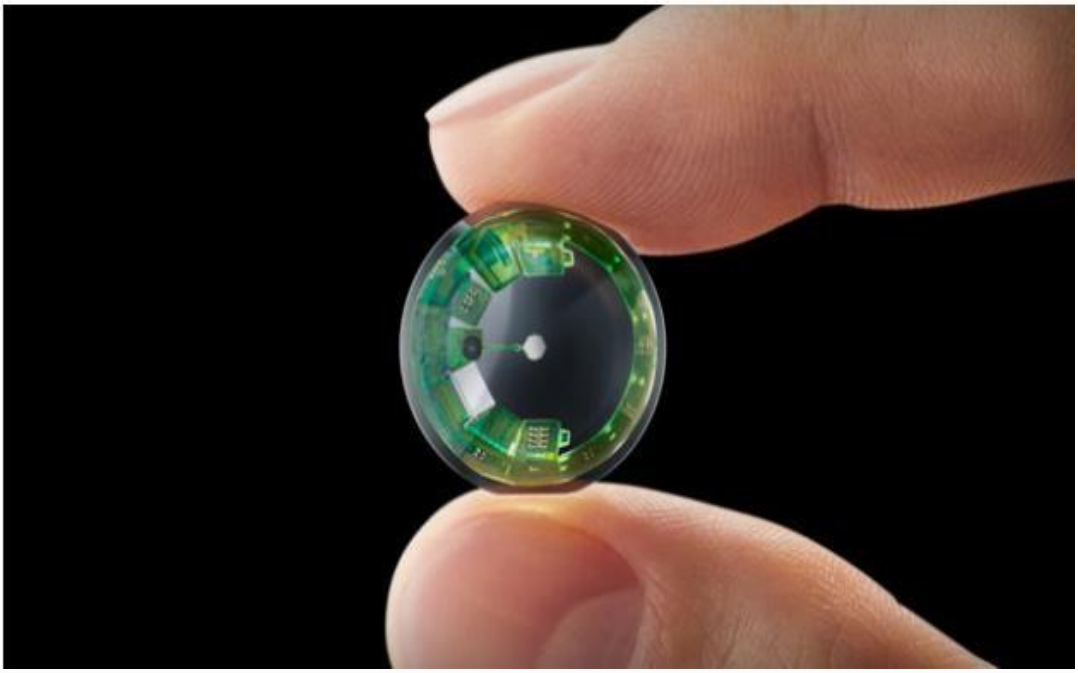
  A peck of pickled peppers Peter Piper picked

  If Peter Piper picked a peck of pickled peppers

  Where's the peck of pickled peppers Peter Piper picked?

- She sells seashells by the seashore

THE DISPLAY OF THE FUTURE MIGHT BE IN YOUR CONTACT LENS



It's been seven years for Mojo Vision to arrive where it is today: a feature-complete smart contact lens in an internal prototype that isnow ready for real-world testing and is the company's first real candidate for a releasable product.

Apparently, inventing the future isn't easy.

The vision (groaner) is huge: a smart contact lens that could eventually replace smartphones, smartwatches, augmented reality glasses, even virtual reality headsets. That's a big ask, and it's taken some serious science, engineering, and iteration to get to evena first potential product.

Currently, the Mojo smart contact lens boasts:

- A 14,000 pixels per inch Micro LED display, the world's smallest at just .5 milli meters in diameter, and densest with a pixel-pitch of just 1.8 microns, the company says)

  5GH ultra-low latency radio to stream AR content

- ARM processor
- Continuous eye tracking via custom-configuredaccelerometers, gyroscopes,
- Magnetometers
- Medical-grade in-lens batteries
- Eye-controlled user interface

The contact lens connects with an external controller that youmight wear like a necklace, where all the heavy compute happens. It uses a proprietary 5GHz radio because Bluetoothis too slow and has too high latency. And the optic includes a "teeny, tiny, reverse Cassegrain telescope like the Hubble" built into the lens. The result is eye tracking that's a 10X improvement over anything else available today, and the ability to build an eye-controlled user interface.

"Basically, it's all about giving you super powers," Mojo VP Steve Sinclair told me recently on the Tech First podcast. "We're building the world's first, true augmented reality smart contact lens. So, something that you could put on your eye, see content when you want to see it, have it disappear when you're not using it, so you look like yourself and you're engaged in the real world."

It has taken a while to get to this point.

Mojo Vision started in 2015 and has raised eight rounds funding totalling $204 million. Investors include Amazon'sventure fund, Stanford's StartX fund, Motorola, LG, KhoslaVentures, and a who's who of venture capitalists.

But the finish line might be closer than you think. Sinclair won't commit to a launch date, and there is FDA regulation and testing that will influence that as well as the company'sinternal testing and iteration. But it's not "way out in the future," he says.

"We're finally there with something we call a 'feature complete'lens," Sinclair told me. "That means, basically, that all of the technical elements are pulled together into a single system that we can wear, and try, and test with."

The seven years is simply due to the challenges involved. The micro LED display needed to be invented basically from the ground up, as did the control system and the optics that focusthe light from the display onto the back of your retina. Building a lens that doesn't twist mattered too: if the lens moves around your eye or rotates as you blink, everything yousee might end up 97 degrees off vertical, and turning your head to the side to read it wouldn't help.

As things stand, however, the company says it has solvedthose issues. "It literally is content that's floating in space around you," Sinclair says. "We can lock it. So, it could be locked in the world, so you can see some content to the right, to the left, to the bottom, up and down, wherever you want to look. And it's up to you to

decide when you bring that content up, and whenyou don't want to see it anymore, it all just disappears and you're just looking at the world."

Athletes might like it for seeing routes and performance data. Technicians might like it for seeing schemata overlaying aircraft engines or building superstructures. Anyone who usesa smartwatch or smartphone today might like it for quicker, more accessible data delivery or augmented reality experiencesthan they can get from existing devices. And those with limitedvision can use it to highlight dangers and routes, Mojo says. It does require a relay accessory, as mentioned above.

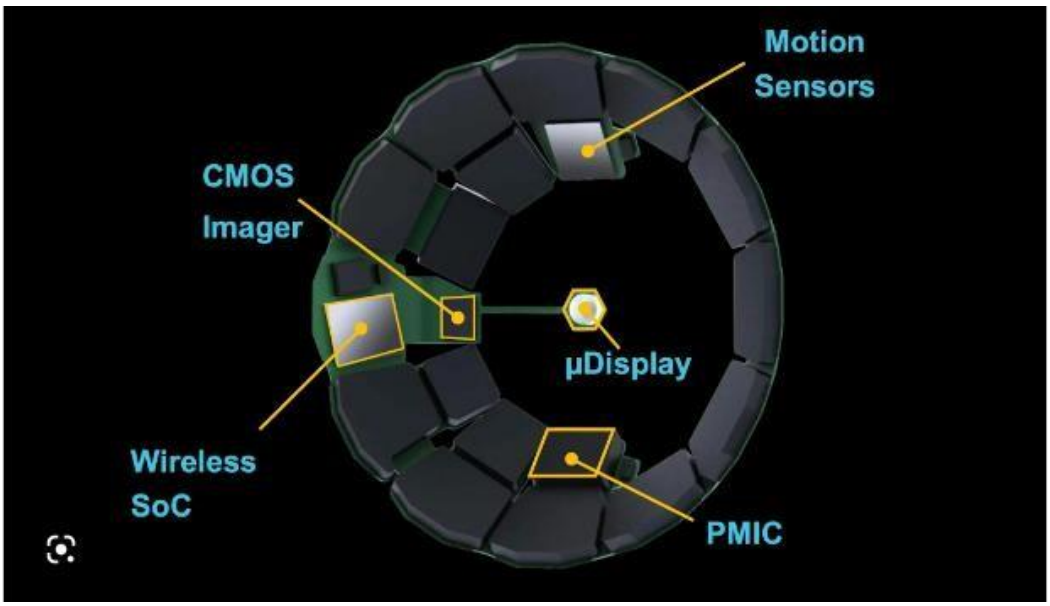
The relay has a processor, memory, a GPU to run the display,and a radio to communicate with the smart contact lenses. (Plus Bluetooth, presumably, to communicate with a phone.) The relay is what's pulling eye-tracking information off the smart lens and determining where to stream data in your visual field.

"Most of the applications that we're using are run on an accessory that you also are wearing on your body somewherenear the head," Sinclair says. "We call it a relay accessory. It could be built into a hat or a helmet, it could be built into a pair of safety goggles, it could be built into a neck band. And so, that's probably the form factor we're going to start with. Ithas to be relatively close to the eyes because the transmit power of the lenses is not particularly high."

As for charging your smart contact lenses?

They charge at night, just like a smartwatch, in thecleaning/charging case.

The lenses themselves are hard lenses, and they are scleral lenses. That means they so not sit on the cornea, the clear front part of your eye that you see through, but on the sclera, the whites of your eyes. That makes them more comfortable, Mojo says, because the cornea has plenty of nerve endings — which is why pokes in the eye are so painful — but the whitesof your eyes do not.



"We measure your eye when you come into your optometristand we get the shape of that eyeball," says Sinclair. "It's not perfectly round. It's got lots of ridges and bumps and such, and we cut the inside of the lens to match the shape of youreye so it rests very comfortably on. So, it is a little bit bigger than what people think of when they think of either corneal hard lenses or daily disposable soft lenses.

But it's quite comfortable on the eye because it's been cut like a puzzle piece to match on your eye."

Interestingly, vision is only part of the plan for this smartcontact lens. Other things Mojo is working on is checking the tear fluid on your eyes, or measuring intraocular pressure, or checking forearly onset of glaucoma. The eyes are a great platform for health sensors, Sinclair says, and that is on the menu as wellas enhanced vision and data delivery via AR.

By
DANDA.SAI VYSHNAVI
21761A0411

XENOBOT

Xenobots are a new type of biological machine or robot that are made entirely of living cells. They were created by a team of researchers at the University of Vermont and Tufts University in the United States, who used a supercomputer to design them.

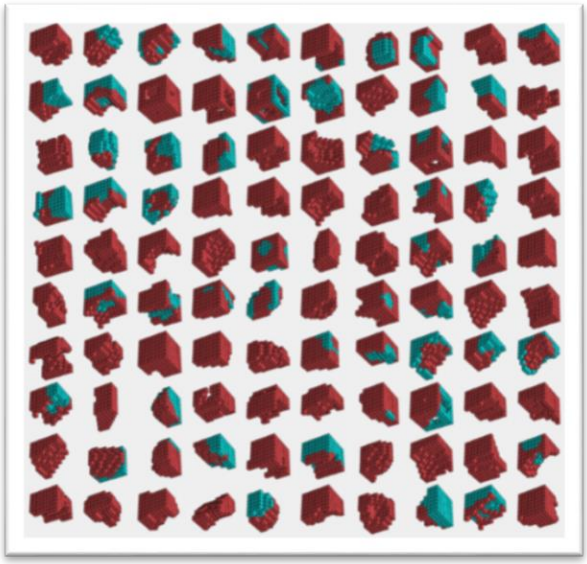


Figure: Xenobots Evolved Designs.

One hundred computer-designed blueprints for a walking organism composed ofpassive (cyan) and contractile voxels (red).

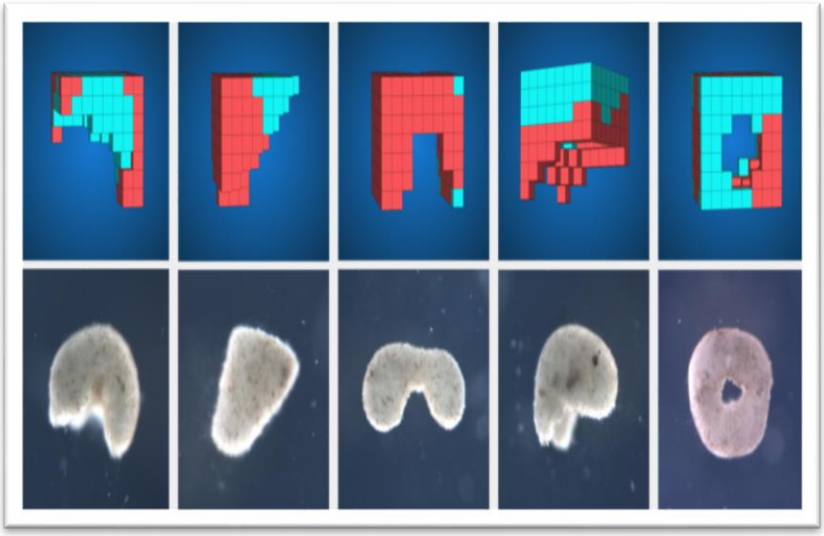


Figure: Xenobot Multiple Design Organism Pairs

AI methods automatically design diverse candidate lifeforms in simulation (top row) to perform some desired function, and transferable designs are then created using a cell-based construction toolkit to realize living systems (bottom row) with the predicted behaviors

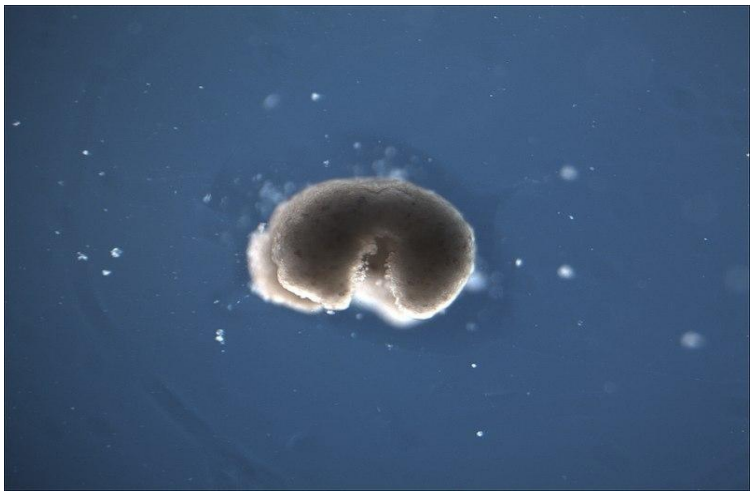


Figure: Xenobot - A tall quadruped.

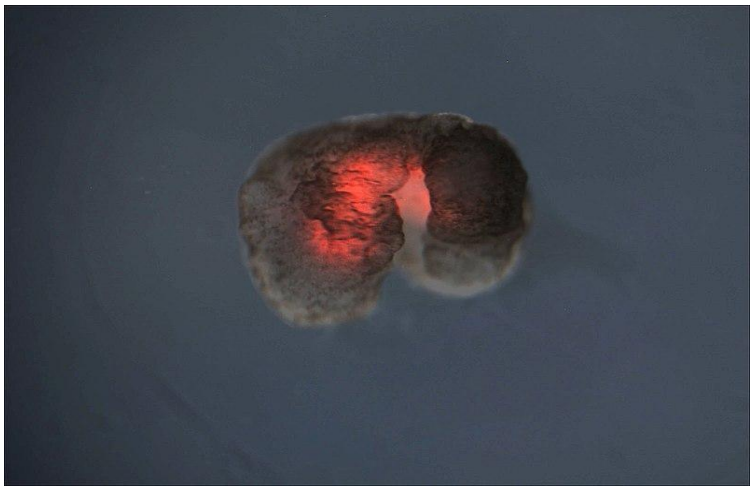


Figure: Xenobot.

The manufactured organism from just above is layered with heart muscle (now glowing red). AI determined the overall shape of the organism, as wellas the location of its muscle, to produce forward movement.

What are xenobots?

- Xenobots are a new type of biological machine or robot that are made entirelyof living cells.

How are they made?

- Researchers used a supercomputer to design different configurations of cellsthat could perform specific tasks, such as moving or carrying objects.
- Stem cells from the African clawed frog were then used to build the actual xenobots by assembling clusters of cells into specific shapes using tiny forcepsand electrodes.

What are they used for?

- Xenobots have a wide range of potential uses in various fields such as biotechnology, medicine, and environmental cleanup.
- They could be programmed to deliver drugs to specific parts of the body, cleanup pollutants in the environment, repair damaged tissues or organs, control pests in agriculture, and much more.

What are their advantages?

- Xenobots are completely biodegradable and environmentally friendly sincethey are made of living cells.
- They can be programmed to perform specific tasks, making them highly versatile and customizable.
- They could open up new possibilities for designing machines that can interactwith and adapt to their environment in ways that traditional robots cannot.

What are the ethical considerations?

- The creation and use of living machines raise ethical concerns that need to be carefully considered.
- These include questions about the status of living machines, the potential risksto the environment and human health, and the implications of using living machines for warfare.

By
Y.Adarsh Sriram
20761A04C6

THIN PAPER SOLAR POWER SOURCE

MIT engineers have developed ultra light fabric solar cells that can quickly and easily turn any surfaceinto a power source. These durable, flexible solar cells, which are much thinner than a human hair, are glued to a strong, lightweight fabric, making them easy to install on a fixed surface. They can provide energy on the go as awearable power fabric or be transported and rapidly deployed in remote locations for assistance in emergencies. They are one-hundredth the weight of conventional solar panels, generate 18 times more power-per-kilogram, and are made from semiconducting inks using printing processes that can be scaledin the future to large-area manufacturing

Because they are so thin and lightweight, these solar cells can be laminated onto many different surfaces. For instance, they could be integrated onto the sails of a boat to provide power while at sea, adhered onto tents and tarps that are deployed in disaster recovery operations, or applied onto the wings of drones to extend their flying range. This lightweight solar technology can be easily integratedinto built environments with minimal installation needs.

“The metrics used to evaluate a new solar cell technology are typically limited to their power conversion efficiency and their cost in dollars-per-watt. Just as important is integrability — the ease with which the new technology can be adapted. The lightweight solar fabrics enable integrability, providing impetus forthe current work. We strive to accelerate solar adoption, given the present urgent need to deploy new carbon-free sources of energy,” says Vladimir Bulović, the Fariborz Maseeh Chair in Emerging Technology, leader of the Organic and Nanostructure Electronics Laboratory (ONE Lab), director of MIT. Nano, and senior author of a new paper describing the work.

Slimmed down solar-

To produce the solar cells, they use nanomaterials that are in the form of a printable electronic inks. Working in the MIT. Nano clean room, they coat the solar cell structure using a slot-die coater, which deposits layers of the electronic materials onto a prepared, releasable substrate that is only 3 microns thick. Using screen printing (a technique similar to how designs are added to silkscreened T-shirts), an electrode is deposited on the structure to complete the solar module.The researchers can then peel the printed module, which is about 15 microns in thickness, off the plastic substrate, forming an ultralight solar device.

They found an ideal material — a composite fabric that weighs only 13 grams per square meter, commercially known as Dyneema. This fabric is made of fibers that are so strong they were used as ropes to lift the sunken cruise ship Costa Concordia from the bottom of the Mediterranean Sea. By adding a layer of UV-curable glue, which is only a few microns thick, they adhere the solar modules tosheets of this fabric. This forms an ultra-light and mechanically robust solar structure.

Outshining conventional solar cells-

When they tested the device, the MIT researchers found it could generate 730 watts of power per kilogram when freestanding and about 370 watts-per-kilogram if deployed on the high-strength Dyneema fabric, which is about 18 times more power-per-kilogram than conventional solar cells.

They also tested the durability of their devices and found that, even after rolling and unrolling a fabricsolar panel more than 500 times, the cells still retained more than 90 percent of their initial power generation capabilities.

While their solar cells are far lighter and much more flexible than traditional cells, they would need to be encased in another material to protect them from the environment. The carbon-based organic material used to make the cells could be modified by interacting with moisture and oxygen in the air, which could deteriorate their performance.This research is funded, in part, by Eni S.p.A. through the MIT Energy Initiative, the U.S. National Science Foundation, and the Natural Sciences and Engineering Council of Canada.

By
R.Gowtham Arun Kumar
20761A04H6

Category -II

REVIEW WRITINGS ON LATEST HAPPENINGS

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INDIA CAN BE A WINNER IN SEMICONDUCTORS

This is a review on latest article representing the latest happening that is “establishment of semiconductor industry in India”. Regarding this aspect Ajay Srivastava published an article “India can be winner in the semiconductors”. This review on that article tells about what actually India requires to establish semiconductor industry in our own mother country. The semiconductor chain has five broad segments like:

1)Chip design

2)Manufacturing of silicon wafers

3)Chip fabrication tools,

4) Chip fabrication units,

5)ATMP.

These are the main factors that India need to focus on. But the only ambiguity is “what are the five important aspects and how to implement them?”. In order to understand this, elaborated explanation about the five aspects is as follows,

Chip design:

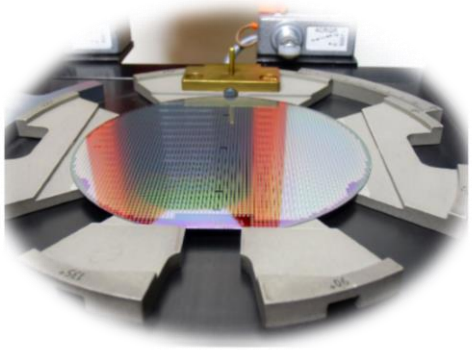
Before getting in to the chip design, designing of circuitry is important. The modern trends in chip design together with advance EDA tools have made the design of chips more scalable and more reliable than ever before. The physical size of transistors has decreased enormously over past decade. This led to both very large chip and also a low voltage chip design which means that chips consume very less power, even a few micro-watts of power. This allowed high scalability of chips in various markets and industries both in terms of chip size and market penetration.

Manufacturing of silicon wafers:

The same semiconductor itself memorizes the element named silicon. Several components are integrated on the silicon chip, which requires a basic silicon wafer. As we mentioned, silicon wafers are used as semiconductors in electronics, specifically, in the manufacturing

process of integrated circuits. Integrated circuits (ICs) are a combination of electronic components that work together to perform a specific function. ICs can hold hundreds or millions of transistors, resistors, and capacitors and are essential in the function of electronic equipment.

Chip fabrication tools:



Chip making requires specialized equipment, chemicals and gasses. Such tools convert the prototype designs into mass produce chips in the fabrication units.

Chip fabrication units:

The chip fabrication units are also known as “fabs”. Fabs mass-produce chips from a prototype. Several machines are used for testing of the manufactured chip at fabrication unit. The will verify it under each and every conditions.

ATMP:

ATMP-stands for “assembly, testing, marking and packing”. The fabricated chip need to perform the above ATMP to get rid of all defects.

This is all about what India need to focus on. The next big level of focus stays on the economy of establishing such a huge factory. With the announcement of 10 billion dollar production linked incentive (PLI) scheme for semiconductors, India has expressed its intent to become a serious player in the annual 500 billion dollar high technology semiconductor business. Due to ongoing US-China trade and technology rivalry, many countries, led by the us are setting up an alternative semiconductor supply chains. India’s window of opportunity lies in this space.

By

Tunikipati Harshitha

20761A0458

HISTORY OF VLSI

VLSI stands for Very Large Scale Integration, which refers to the technology of packing a large number of electronic components onto a single chip.The history of VLSI begins in the 1960s, when the first integrated circuits (ICs) were being developed. At that time, ICs contained only a few transistors and other components, and were used primarily in military and aerospace applications. However, as the technology improved and costs came down, ICs began to find their way into commercial applications, such as calculators, watches, and other electronic devices.

In the 1970s, advances in lithography and other manufacturing techniques enabled the development of more complex ICs with hundreds or even thousands of transistors. These early VLSI chips were still relatively expensive and difficult to manufacture, but they paved the way for the even more complex chips that would come later.

The 1980s saw the rapid growth of the semiconductor industry, as more and more companies began to develop and manufacture VLSI chips for a wide range of applications. At the same time, advances in design software and simulation tools made it easier for engineers to design and test complex chips before they were fabricated. In the 1990s, the focus of VLSI shifted from simply packing more and more transistors onto a chip to improving performance and reducing power consumption. This led to the development of new manufacturing techniques, such as silicon-on-insulator (SOI) and strained silicon, as well as new design techniques, such as clock gating and power gating.

Today, VLSI chips are ubiquitous in modern electronics, from smartphones and laptops to cars and airplanes. They contain billions of transistors and other components, and are manufactured using cutting-edge techniques such as extreme ultraviolet (EUV) lithography.

The history of VLSI is a story of constant innovation and improvement, driven by the demands of the market and the creativity of engineers and scientists. As technology continues to evolve, it's likely that the future of VLSI will be just as exciting and ground breaking as its past.

By

P Soma Sumanth

20761A04H0

Category -III

POETRY

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YOU CAN

"If you think you are beaten, you are
If you think you dare not, you don't,
If you like to win, but you think you can't
It is almost certain you won't.

If you think you'll lose, you're lost
For out of the world we find,
Success begins with a fellow's will
It's all in the state of mind.

If you think you are outclassed, you are
You've got to think high to rise,
You've got to be sure of yourself before
You can ever win a prize.

Life's battles don't always go
To the stronger or faster man,
But soon or late the man who wins
Is the man WHO THINKS HE CAN!"

By
J.Kushwanth Reddy
22761A0493

DAFFODIL

She relishes wearing gowns
Her looks are filled with infinite nouns.
Laughs as lovely as birds chirping
Pronunciation is harmonizing.
She turns a blind eye towards enmity
When baited, she leaves her humility.
Starts her day as frisky as a beam of light
Never renounces, but perpetually elects to fight.
She was nourished by alluring lineage
But was dejected due to battles in the cage.
Her conscience was probing for happiness
The affliction made her tackle the demureness.
She built a craving towards life with party
But the ache of solitude prompted self-pity.
Calmness molded her to think
By and by flourished on to pink.
She began to raise as a daffodil,
Cloned to mother nature, besides a pill.
She assured to serve love and laughter around
Delighted the significance with smiling pounds.

By
Sk.Ayeesha
20761A04H9

Category -IV

DRAWINGS

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1.LORD KRISHNA

By
Vasudha
21761A04A7

2.A BEAUTFUL FACE

3.IMPACT OF TECHNOLOGY ON SOCIETY

By
M.Kiranmai
20761A04G4

4.CRYING LIKE A MELTING ICE BERG

Category -V

PUZZLES

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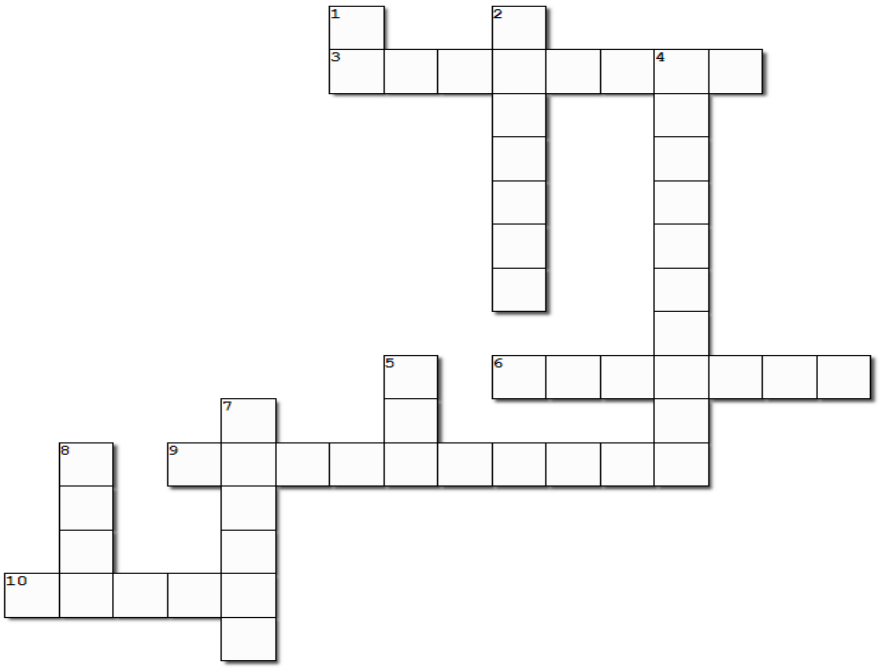
CROSSWORD PUZZLE



Across

3. These are typically used for communication purposes, such as transmitting audio or video signals, data, or control signals.

6. It is used to measure the current flowing through a component/circuit.

9. A digital circuit that can perform logic operations.

10. Two-terminal electronic component that conducts current primarily in one direction.

Down

1. A logic gate that outputs a high voltage if any of its inputs are high.

2. It used in construction materials, making transistors, in computer chips and solar cells.

4. A circuit that can amplify a signal.

5. A device that can convert a digital signal to an analog signal.

7. The electronic device used to switch or amplify voltages in circuits. It is a voltage controlled device.

8. The process of creating an integrated circuit by combining millions or billions of MOS transistors onto a single chip.

By
M.S.V.BALA VARDHAN
20761A04G7

What I am…?

1. I am a basic logic gate that has two inputs and one output. I output a high voltage if and only if both of my inputs are high. What am I?
2. I am a device that can amplify a signal, but I also introduce noise into the signal. What am I?
3. I am a device that can store one bit of data. I have two stable states, and I can be set to either state by applying a voltage. What am I?
4. I am a device used to amplify or switch electrical signals and power. I am one of the basic building blocks of modern electronics. What am I?
5. I am a device that can convert analog signals to digital signals. I sample the analog signal at regular intervals and assign a digital value to each sample. What am I?
6. I am a circuit that can generate a clock signal with a specific frequency. What am I?
7. I am a type of filter that can attenuate signals above a certain frequency. What am I?
8. I am device that provides accurate time and amplitude measurements of voltage signals over a wide range of frequencies. What am I?
9. I am device that selects between several analog or digital input signals and forwards the selected input to a single output line. What am I?
10. I am a device that can measure electric potential difference between two points in an electric circuit and I am connected in parallel. What am I?

By
P SOMA SUMANTH
20761A04H0

E – Resources

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