## Eyeball controlled by phone

In an effort to make eye tracking cheap, compact, and accurate enough to be included in smartphones, a group of researchers is crowdsourcing the collection of gaze information and using it to teach mobile software how to figure out where you're looking in real time.

Researchers at MIT, the University of Georgia, and Germany's Max Planck Institute for Informatics are working on the project, and they say that so far they've been able to train software to identify where a person is looking with an accuracy of about a centimeter on a mobile phone and 1.7 centimeters on a tablet.

The new generation of smart phones has been revolutionised with the introduction of technologies like touch screen, gyroscope, photo camera, etc. These innovations in conjunction with the increase in hardware performance, allows a different approach in the use of these devices improving user experience and interaction. Several recent research projects demonstrate how the interaction with mobile phone technologies improved.

As Smartphones evolve researchers are studying new techniques to ease the human-mobile interaction. The Eye Phone, is a "hand-free" interfacing system capable of driving mobile applications/functions using only the user's eyes movement and actions like winking.

Eye Phone tracks the user's eye movement across the phone's display using the camera mounted on the front of the phone; to track the eye and infer its position on the mobile phone display as the user views a particular application.
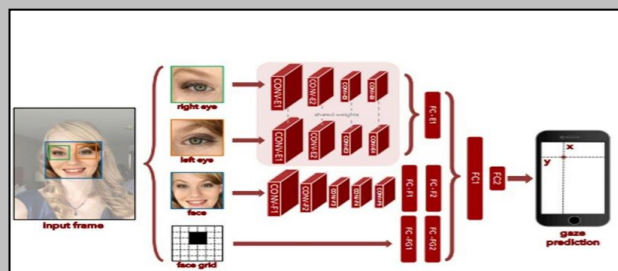
Eye Phone Design:

The eye tracking and blink detection mechanisms was originally designed for desktop machines using USB cameras. The Eye Phone design breaks down into the following phases:

- An Eye Detection Phase;
- An Open Eye Template Creation Phase;
- An Eye Tracking Phase;
- A Blink Detection Phase.

Various systems have been implemented that integrate eye tracking capabilities into a mobile phone. In a system capable of driving mobile applications using only the user's eye movements and actions is described, while in, different approaches, in particular dwell-time method and gaze gestures, are compared in order to investigate how gaze interaction can be used to control applications on mobile phone.

- Vaishnavi Arun Pawar (SYCO) Student

Mass production of revolutionary computer memory moves closer with ULTRARAM™ on silicon wafers for the first time

A pioneering type of patented computer memory known as ULTRARAM™ has been demonstrated on silicon wafers in what is a major step towards its large-scale manufacture.

ULTRARAM™ is a novel type of memory with extraordinary properties. It combines the non-volatility of a data storage memory, like flash, with the speed, energy-efficiency and endurance of a working memory, like DRAM. To do this it utilises the unique properties of compound semiconductors, commonly used in photonic devices such as LEDS, laser diodes and infrared detectors, but not in digital electronics, which is the preserve of silicon.

Initially patented in the US, further patents on the technology are currently being progressed in key technology markets around the world.

Now, in a collaboration between the Physics and Engineering Departments at Lancaster University and the Department of Physics at Warwick, ULTRARAM™ has been implemented on silicon wafers for the very first time.

Professor Manus Hayne of the Department of Physics at Lancaster, who leads the work said, "ULTRARAM™ on silicon is a huge advance for our research, overcoming very significant materials challenges of large crystalline lattice mismatch, the change from elemental to compound semiconductor and differences in thermal contraction."

Digital electronics, which is the core of all gadgetry from smart watches and smart phones through to personal computers and datacentres, uses processor and memory chips made from the semiconductor element silicon.

Due to the maturity of the silicon chip-making industry and the multi-billion dollar cost of building chip factories, implementation of any digital electronic technology on silicon wafers is essential for its commercialisation.

Remarkably, the ULTRARAM™ on silicon devices actually outperform previous incarnations of the technology on GaAs compound semiconductor wafers, demonstrating (extrapolated) data storage times of at least 1000 years, fast switching speed (for device size) and program-erase cycling endurance of at least 10 million, which is one hundred to one thousand times better than flash.

-Tanushree Pandurang Velapure (TYCO) (Student)

SVERI's College of Engineering (Polytechnic), Pandharpur

Department of Computer Engineering

Complit

In touch with tomorrow

Date: 26 Jan 2022

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Department Vision

To be recognized as one of the best computer engineering department in Maharashtra providing core knowledge and skills along with professional ethics enabling students to reach higher goals.

Department Mission

To impart value based Technical Education in Computer Engineering.

To support for technical knowledge of students in the field of Computer Engineering.

To make the students efficient in various skill Sets in Computer Engineering.

To encourage students for lifelong learning.

AI-designed self-replicating living robots created

Scientists at the University of Vermont (UVM), in collaboration with Tufts University and Harvard University, have
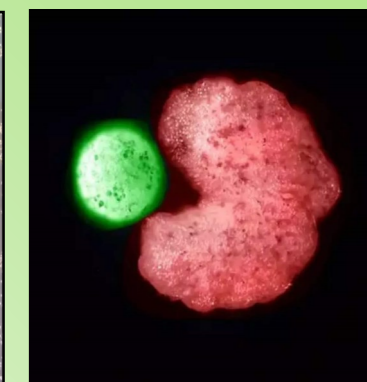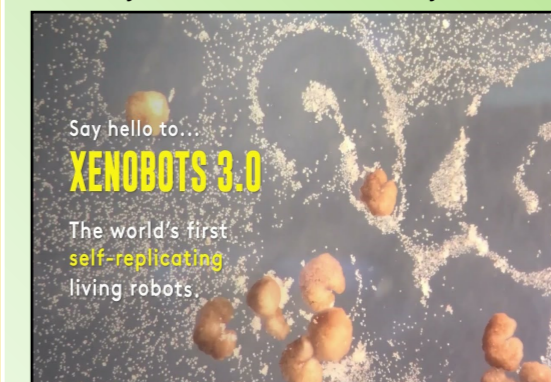
Made from frog cells, these computer designed organisms gather single cells inside a Pac-Man-shaped mouth-and release Xenobot 'babies' that look and move like themselves. Then the offspring go and do the same-over and over (Credit: www.wm.edu/news)

discovered an entirely new form of biological reproduction and applied their discovery to create the first-ever, selfreplicating living robots called Xenobots. These computerdesigned and hand-assembled organisms, inspired by Xenopus frog cells, can swim out into their tiny dish, find single cells, gather hundreds of them together, and assemble 'baby' Xenobots inside their Pac-Man-shaped mouth that, a few days later, become new Xenobots that look and move just like themselves. Scientists believe the development will help them create new technological solutions like deploying living machines to pull microplastics out of waterways or build new medicines.

-Akshay S. Jadhav (TYCO) (Student)

HOD Message

It is our pleasure to present quarterly Newsletter "CompLit" of our Computer Department. This Newsletter helps to disseminate the information about department. Even though pandemic situation of COVID 19 is not over, Computer Department had scheduled lectures and other activities very smoothly and successfully using online teaching mode. Our 180 students are undergone Microsoft Certification. As you go through pages of CompLit, you will realize our students have succeed in academics also. Our department's staff members are not only focuses on our student's academic performance but also contributed towards society by providing proper career guidance to students at high schools, by donating technical books to the library as well as by distributing clothes at old age home. I appreciate efforts of our students and staff members to bring this Newsletter in existence. I wish you all Happy Republic Day...

-Ms. B.M. Deokar

Metaverse and it's Limitless Possibilities

Abstract

In July 2021, Mark Zuckerberg announced how Facebook plans to make metaverse a reality in the future. On 28th October 2021, he announced that Facebook Inc. would rename itself as Meta Platforms Inc. and Meta in short. The gaming industry is gung-ho about it and is betting big. According to the market research firm Strategy Analytics Inc., the global metaverse market could grow to $280 Bn. by 2025 from $46 Bn. in 2020. This artefact attempts to provide a glimpse of this technology.

Introduction to Metaverse

There are several schools of thought on what a 'metaverse' means. In simple words, it will effectively change the way we communicate and will shape our experiences by merging the physical and the virtual worlds more realistically. At the same time, it will also allow us to port this world across environments, wherever we go. Let us assume I usually work at my office desk on a computer or a laptop. In the metaverse, I could step outside my workplace and continue to work without carrying these gadgets. I could call in my colleague, who would virtually get teleported to where I am, to show the artefacts I have created, seek feedback, bid adieu, and continue with my work.

Metaverse in Action

Metaverse is an environment where one can transport themselves into a virtual world using a VR device or any other emerging mechanisms and carry out specific tasks like attending meetings, playing multiplayer games, engaging and interacting with others, etc.
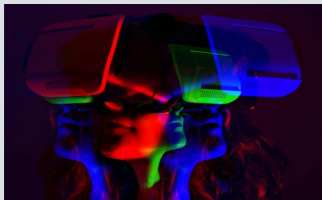
Consensus 2021, one of the biggest Crypto and Blockchain events related, held in May 2021, hosted half an hour roundtable talks every day using metaverse.

Gaming is one of the pioneer industries of building metaverse alongside crypto, fashion, and Hollywood movie industries. Metaverse has already made rapid strides in many multiplayer games, the most notable ones being Fortnite: Battle Royale, Roblox, and Minecraft. Top players are keen on building inter-operability among these games, like migrating their costumes/avatars from one game to another

the world economy will grow

to elevate the end user's experience to the next level. Close to 100 companies are creating metaverse ranging from programming engines, hardware interfaces, products, avatars, marketplaces, etc. Let's see a couple of more cases to get a better view.

NVIDIA and BMW are building a Factory of the Future, an amalgamation of reality, virtual reality, robotics, and artificial intelligence (AI). BMW will replicate virtual operations of its manufacturing plant using this future factory, allowing humans and robots to collaborate.

Nike has already filed for seven trademark applications and is looking to make and sell virtual branded sneakers and apparel. Sotheby had launched a digital art platform and will act as a marketplace to sell Non – Fungible Tokens (NFT).

Opportunities

There are numerous opportunities for all, a few of which are:

- Individuals, groups and organizations can create and sell NFTs
- One can escape into the virtual world, get immersive experiences hitherto seen in dreams and movies
- Get an afterlife/marine world experience from a different perspective
- Flaunt NFTs, attain stardom, grow the network and net worth
- Organizations can mimic real-world assets and processes for an immersive experience and make humans and systems collaborate
- Fear Of Missing Out (FOMO) will force more and more organizations to embrace this and provide service opportunities for service providers
- Hardware manufacturers will produce new devices and strategies to make existing devices obsolete
- Devices might become micro/nano and easier to carry
- Introduction of state-of-the-art technologies for better revenue opportunities and business models
- New jobs will get added, and thereby

- Raise fresh investment avenues to explore
- Organizations can add a new twist to their business and roll out new offerings

Challenges

It is exciting to note that there are limitless opportunities for individuals and companies to create, access, experience, buy and sell products/services/virtual environments but on the other hand, it comes with its challenges and threats:

- It will be addictive and become quite pervasive. The mental well-being of people needs to be guarded against addiction, and care of the affected who will be unable to distinguish between a real and virtual world
- A lot has to be considered if interoperability must become a reality in terms of persistence across various virtual worlds with real and virtual world interactions
- Many new technologies can spring up, and we will have to catch up by testing multiple devices/applications that provide numerous uses
- Data privacy laws are still an afterthought for any digital transformation undertaken by companies. What sort of policies, within and outside geographical borders, laws would be needed to provide a level playing field
- What sort of regulations would be needed to ensure fairness to all involved and safeguard the environment at the same time
- How to keep consumers continuously educated about the new possibilities
- How to ensure a smooth transition from currently bulky devices owned (by consumers) to probably micro/nano ones that might emerge soon

In short, the metaverse is evolving and providing captivating experiences in various ways. Use cases are getting added daily, and we see many companies joining the bandwagon to be a part of this revolutionary technology both – as a provider and as a consumer. It is a long way before the ecosystem can make the metaverse a thriving reality, and the future seems exciting towards this endeavour. Get ready to wear different virtual avatars, buy an exclusive piece of land on Mars, own crazy NFTs, flaunt stylish dresses, etc., to have the most fulfilling immersive experience!

-Arbaj Naushad Jamadar (TYCO)

Department Activities

As human being it is our moral responsibility to contribute towards society in order to address somebody's needs. So, from Department of Computer Engineering of SVERI's College of Engineering Polytechnic, Pandharpur Mr. A. S. Bhatlavande along with fellow colleague have visited old age home "Matoshree Vrudhashram", at Gopalpur. They have distributed clothes and performs contributions towards society sincerely.

Career guidance for students at certain age is very important. It will help to them for identifying career opportunities to achieve professional goals. Ms. B. M. Deokar is guiding and presenting career openings for students in one of the school.

AI and ML will inlock the next level in chip design game

The rules for what can and cannot be manufactured are also extremely complex. Common IC processes of 2015 have more than 500 rules. Furthermore, since the manufacturing process itself is not completely predictable, designers must account for its statistical nature, The complexity of modern IC design, as well as market pressure to produce designs rapidly, has led to the extensive use of automated design tools in the IC design process. In short, the design of an IC using EDA software is the design, test, and verification of the instructions that the IC is to carry out.

Cadence Design Systems, Inc announced the delivery of the Cadence Cerebrus Intelligent Chip Explorer, a new machine learning (ML) based tool that automates and scales digital chip design, enabling customers to efficiently achieve demanding chip design goals. The combination of Cerebrus and the Cadence RTL to-signoff flow offers advanced chip designers, CAD teams and IP developers the ability to improve engineering productivity by up to 10X versus a manual approach while also realizing up to a 20% better power, performance and area (PPA). With the addition of Cerebrus to the broader digital product portfolio, Cadence offers the industry's most advanced ML enabled digital full flow, from synthesis through implementation and signoff. The new tool is cloud enabled on Amazon Web Services (AWS) and other leading cloud platforms and utilizes highly scalable compute resources to rapidly meet design requirements across a wide range of markets including consumer, hyperscale computing, 5G communications, automotive and mobile.

ELE Times correspondent Mayank Vashisht spoke With Venkat Thanvantri, VP of Research & Development, AI/ML for Digital and Signoff, Cadence on how automated processes can be useful in chip design cycle and how they directly befits the designers. We also talked about Cadence's latest ace in the hole 'Cerebrus', Excerpts.

-Dipali Bapu Anpat (TYCO) (Student)

Our Achievements A.Y. 2020–21

SR. NO	Name Of the Student	Marks	Class	Rank
1	TENDULKAR RUHI GANESH	99.60%	FYCO	First
2	DHARMADHIKARI RASIKA MAHESH	98.60%	FYCO	Second
3	JAGTAP SNEHAL SUBHASH	98.20%	FYCO	Third
4	SALUNKHE SAURABH SATISH	95.33%	SYCO	First
5	KASHID NILESH DHANAJI	94.67%	SYCO	Second
6	KULKARNI SHRAVANI GOPALKRISHNA	92.93%	SYCO	Third
7	PAWAR NUPUR NILESH	95.89%	TYCO	First
8	SOLGE BAJRANG SURYAKANT	94.29%	TYCO	Second
9	GHODAKE RAJESHWARI DHARMRAJ	92.97%	TYCO	Third

Editorial

It gives me great pride to present to you this issue of our departmental Newsletter. Newsletter is an amalgamation of all the events held in the department and it has an instrumental role in providing a greater exposure of the achievements accomplished by the students and the faulty.

Thank You all.

Faculty Co-coordinator: Ms. Pawar M.P.
Student Co-coordinator: Mr. Gawali S.L.
(TYCO)