TARANG

2022

What is considered
a wearable

Attire 2.0
Never Offline

Applications and
Challenges

W E A R A B L E
T E C H N O L O G Y

Contents

Message from the Head of Department

It makes me immensely proud to see yet another remarkable edition of our department magazine "Tarang 2022". This magazine is a glimpse into the wide ranging interests of the students and the teachers of our department. Despite the sharp transition to the offline mode, our students and faculty have made a remarkable comeback with the same level of energy and enthusiasm as pre-covid times. As we have re-entered our offline routines, we carry with us the lessons learnt during our online mode, utilizing them to further enhance our offline teaching-learning experience.

It felt very uplifting to see the college teeming with life once again and interacting with my students and colleagues on a personal level. As usual, our students have yet again excelled in academic and co-curricular activities. With that said, I would like to congratulate the editorial team for their efforts in bringing out this year's issue centered on Wearable Technology, which is one of the most thought-provoking topics of discussion today. I hope the readers enjoy the articles and relate to the content.

Wishing all the best....

Dr. Prachi Mukherji

HoD, E&TC Department.

Meet the editorial team

From science fiction to reality, wearable gadgets have already made the leap forward. The number of connected wearable devices worldwide has more than doubled in the span of three years, increasing from 325 million in 2016 to 722 million in 2019. The number of devices is predicted to reach more than one billion by 2022. The main question is; are wearable technologies just a passing fad or are they the next big step in modern devices?

Tarang's 2022 edition, "The Future with Wearable Technology", brings together such charged pieces about how new technologies alter parts of our world. It also touches upon the opportunities and challenges they entail. As engineers, we need to look at the topic from multiple angles, and we believe we have a fair collection of different perspectives on the topic. Along with the students' views, we have included some words of wisdom from a senior faculty member. Also included is a glimpse of the achievements made by our students and faculty in the academic year 2020-2021. We sincerely hope that it proves to be an insightful read and sparks new ideas in the reader's mind.

Welcome Wearables!

It will be completely normal to have electronics on you at all times, indoors and out. We're on the lookout for innovative technology and approaches to self-awareness. Garments can do everything our skin does, they just have a bit more awareness of what's going on in the cyber world. It's difficult to know where to start, but it'll be an interesting adventure. Wearable technology enhances your awareness of things without interfering with your daily activities. Back in the early 1990s, we looked at the idea of wearable technology, and one of my students, Dad, was one of the first to develop Google Glass. Why should you disrupt social interactions when you can just have ambient awareness?

Consider the history of the pocket watch. Originally watches were just these things that you had on the wall or the big clock tower and then people began making them small and putting them in their pockets. That idea spread and that's how the wristwatch was born. It was nice to just have ambient awareness. It's not something that interferes with social connection, But these things can add a little to it all right they can annotate it they can augment it really it's a very social technology anything you wear on your body as a second skin today wearable technology is embedded into something whereas a term we really have to think about how do you make the fabric itself smart for example think about a garment you don't have to wash they can change the shape their colour fabrics with a metallic coating or conductive yarns We can get a textile that can detect your presence. Imagine everything we wear becomes a part of a digital world since clothing is the burden of a digital system. The design community is flocking to healthcare to create better products, according to the Digital Network. Better sensors and wearables that can track, sense, and measure our current state of being able to look at actual numbers . Wearable technology is extremely different from what we are used to. Instead of just buying we are looking for the most up-to-date version. We are trying to come up with our own features and figuring out how to make them a reality. The entire society is made up of humans and computers interacting with one another, which is referred to as cyborgs.

That's the current business model of tech companies as they try to be your one-stop shop for everything. Take a look at what tech companies have been up to: Amazon started as a bookstore, turned to online retail, then expanded their business with hardware: tablets, phones, Alexa, and pretty soon their digital assistant was in millions of households. Now with their doorbell systems and Amazon delivery they're slowly infiltrating everything.

The best example of this methodology is the Windows Phone for many it was hardware that held on for far too long after all why would Microsoft keep developing a product that was losing money and clearly losing to the competition because it got their software into your hands the directive of essentially every major tech company is to win the battle to control most of our lives do that and you win the profit this isn't inherent Industry leaders understand that cellphones have become commonplace. Wearables, on the other hand, are new and exciting. We're not just talking about Apple watches or the failed Google Glass here; we're talking about how tech will be further integrated into our daily lives.

Wearable tech is already surpassing smartphones as the fastest growing tech innovation consumers can't get enough of. Many wearables are gimmicky, which is why the Apple watch sits on the bathroom counter and why that activity tracker you bought is probably never used. We buy wearables because we want them to alter our lives.Our lives are made easier, but there are drawbacks like as frequent charging or bulky design that often get in the way of the actual advantage, so what's next in the wearables sector is the prevalence of versatility and energy efficiency.

Anyone who has used a wearable device knows that consumers want a device that can do it all, integrates with everything, and most importantly, doesn't require charging every five minutes. Smartwatches, belts, earbuds, accessories, implants, patches tattoos, and more could gradually augment how we use our smartphones and help tech more passively improve our daily lives after smartwatches smart earbuds are the most popular wearable tech as of late what used to mean hours of pairing and endless Wirelessly connected earbuds that effortlessly manage other tech and fit into our schedule have replaced the need for hours of pairing and endless charging. Apple's heart monitor has already saved lives thanks to its tracking technology, and these wearables are becoming more like second nature to use. Google's Juh Quartz project is working on yarns that incorporate touch and gesture controls, allowing wearable garments or textiles to operate gadgets. Companies are even developing patches that track our bodily states as well as health statistics such as hydration and temperature.

Breaking the industry into two areas, input and solution, is the best way to understand the future of wearable tech. All wearables must take some input and use it in some way. Wearables are constantly improving, and machine learning algorithms are allowing the transformation of simple sensor input into more actionable health or activity data. In essence, they're helping wearable tech grasp the concept of their use. Integrated circuits are getting smaller, and understanding how wearables can and will be used is improving. At first, Apple's engineers had little market research of how or why the average person might buy their watch today. Better information leads to better personal solutions.Wearables will enable better personal monitoring, whether for health purposes or simply learning your routine, which means better scheduling, better health knowledge, and unfortunately, if we're not careful, better ads being delivered to us on digital platforms. Wearables are the next step in fully integrating digital infrastructure with a very analogue life that we've retained for thousands of years. If you want to foresee what's next in tech, the easiest way to do it is to put yourself in the mindset of a tech business.

For the most part, this means hardware, and most tech companies are ready to lose money on hardware and wearables in order to further integrate a few more individuals into their buying funnel and sell them additional services or products. There are three main areas that the future of wearables and the tech industry in general are focusing on as they develop the next generation of products: performance, sustainability and resilience. For much of tech's history, engineers have struggled to make durable devices that can be updated on a regular basis. This is a side effect of the rapid advancement of technology, but companies are being forced to rethink their approach as we deal with more permanent tech like clothing and implants in the next evaluation of the requirement to build long-lasting products. Companies need better ways to assess how and if their products will affect our lives. Wearables aimed at health augmentation will need to go through clinical trials of some sort, and algorithms to aid our scheduling or digital experience will need to be improved and formatted quickly.

Finally, when wearables first hit the market, it seemed like there was a wearable for everything. Companies took a shotgun approach to market research, resulting in a plethora of mediocre products. These new focused areas in wearable technology, as well as lessons learned in the previous Wearables have gotten less gimmicky and more amazing in recent years. Whether you believe in it or not, the future of technology appears to be heavily focused on the advancement of wearable technology.

Look Smart - The Story of Smartglasses

Manasi Mujumdar, Final year Entc

There is a popular phrase that says one should always 'look smart'. With the commencement of the second decade of the 21st century, this phrase is taking its literal form!

If you thought the only things that can be smart are our mobiles and laptops then you are in for a surprise as the advent of eyeglasses merging with wireless technology comes about in its full glory.

Smart glasses are an attempt at bringing about technological modification into lenses by merging wireless connectivity and imaging into glasses. To say, you would be able to make verbal requests akin to Siri and Alexa, swipe controls enabled in the glass frame by tapping or touching, and even have body gestures used for recognition such as head and eye moments. It would almost be your thoughts and emotions that would be controlling the way you look at the world!

There are four main features that distinguish these glasses from the usual ones. Its portable central processing unit, that handles all the smart functions. It is small and located on the arm of one of the ear rests. Most smart glasses nowadays pair microphones for instant mobile messaging and for listening to podcasts and music. All this with just one gesture from your eyes or head!

Another really cool feature of these smart glasses is an inbuilt projector that is located at the top of the lens. This enables a digital view of images and text on our glass lens, somewhat like a makeshift laptop screen!

But will smart glasses overlook the main purpose of glasses? Of course not! Developers have been wary enough of the obvious role of any glass i.e to see better. Many models have incorporated liquid crystal technology to filter out brightness and ensure the technological addition doesn't tamper with vision in any sort of way.

So what's the future of these glasses? Big multinational corporations have dived into the market of smart glasses. Facebook along with Ray-Ban is looking to launch augmented-reality-based smart glasses that could have voice control and also live-stream digital images. Amazon has also launched echo frames that are like the addition of Alexa to your normal glass frames.

With the big players of the market stepping into the wearable technology market, we sure can expect a lot more of these surprising and exciting technological additions to our life!

Smart Clothing
Sakshi Dighade, Final year Entc

Wearables are being considered the most likely technologies to transform future health care and lifestyles. The future of wearables is so much more than just providing intelligent assistance. I think that this revolution began with the smartphone and now, wearables are equipped with sophisticated sensors blending with technology and advanced analytics, are being explored to develop functionalities of truly portable medical laboratories. Soon, we will leave our beloved smartphones behind. With screens all around us, the urge to transform our daily devices into smart devices is increasing. To achieve real-time monitoring, technologies like the Internet of Things, Embedded Systems, Machine Learning, Nanotechnology are widely used to enable required electronic communication.

Seamless integration with smartphone apps permits for targeted information to be delivered in real-time by using the concept of the Internet of Things (IoT). It also enables us to calculate and monitor precisely and thus has the most significant influence on the fitness and healthcare industries. Wearables emerged hugely from biomedical industries. From health-monitoring watches and bands like 'Fitbit' to Siren's smart socks to detect foot ulcers in diabetic patients; we surely are moving with great pace into the Future of Wearable Technology.

"Any sufficiently advanced technology is indistinguishable from magic." This statement just seems so true now. Electronic clothing is already gearing up towards sustainable fashion. Furthermore, the growth of mobile networks enabled the development of wearable technology. It becomes essential to perfect the balance between upcoming fashion trends and high tech.

While clothing at its base, electronic circuits, LEDs, conductors, sensors, microcircuits, and software are incorporated; along with the electronic thread embroidery techniques. To add such amazing functionalities into textiles, material science and nanotechnology are getting more and more advanced. Metallics, optical fibers, and conductive polymers are being added to textiles to allow sensory capabilities, electrical conductivity, and data transmission on clothes. Also, we require sensors that can withstand multiple washes and still perform accurately and effectively. One of the foldable and machine-washable outfits is Ballantine's TshirtOS.

Also,3D printing enables you to make patterns and draw pictures and letters on silk, giving it the ability to transform movement into energy. Most smart clothing currently uses lithium-ion batteries, which demand frequent charging. Some Research and Development Units of related fields are working on textiles that can harvest the user's body heat to power electronics.

Along with so many pros associated with this tech, one cannot ignore the underlying cons. There lies a huge dilemma of flexibility, power supply, e-waste, data breaches and personal data access storage. Yet, technology gets fascinating day by day and all we can hope is to try these cool wearables as soon as possible.

Faculty interview - Dr. Anita Patil

If you were given a chance to design any wearable, what would be your area of interest or domain?

Given a choice and chance, I will be happy to develop the wearables which will be useful in case of senior citizens who are confined to bed due to age and some health issues. In the present scenario, being in nuclear families, it is difficult to continuously monitor the health parameters of elderly people. So I will be happy if I could contribute to develop some such device that gives an alarm to nearest relative and doctor in case of some emergency. In fact, I am working on this along with my project students and I hope we will come up with some outcome which will be useful for patients in post-hospitalization care.

We are sure you have been witness to a drastic growth in technology from the 1990s to now in 2022 where technology in terms of electronic wearables is now used to track A-Z of your health without visiting any clinic. Do you feel any apprehension while trying out such technology that is so well integrated with our lives?

Yes, the revolution and development in this field is amazing. However, I feel such devices should be used based on your need and not just for the sake of using/exploring new gadgets. If the need is justified, definitely one should try the wearable devices.

Though not for the medical/ health reasons, there are justified applications of such devices in the other fields also, like education, entertainment and recreation. If you imagine the development of smart gadgets applicable to these fields, then sky is the limit.

With reference to the previous question, how much would you encourage the use of technology such as Fitbit, or in near future even the use of smart glasses (although not yet popular in India) to students? In general to what extent do you think it is beneficial to rely on technology for assisting us in our day to day life?

Smart gadgets are helpful in education and entertainment and the advancement in this domain will give an amazing user experience. But one should not get carried away and should not be addicted to smart gadgets. As we experienced in the pandemic, we tried to keep the pace with time and completed the academics to ensure that students will not lag behind and lose the placement opportunities. But we all know how much we missed that classroom teaching-learning experience.

Of course, there is going to be a paradigm shift in the field of education as well as in our day to day lives. I feel there should be a nice blend of technology and conventional methods in all aspects of life and we should take benefits of both to make world better place to live and also make our lives beautiful.

Do you use any of the popular smart watches like Fitbit, or an Apple watch? If yes, have their health monitoring features helped you in any way? If no, do you prefer not to use these smart devices and if so why?

Honestly speaking, I don't use any of such smart device for health monitoring.

Our body communicates to us silently and continuously, which we should be able to listen to and take actions accordingly. For simple tasks like drinking water, we need not rely on gadgets. But for vitals that we cannot directly feel, like blood pressure, it may be good to use wearable gadgets to monitor our health. Of course, if anyone is going through some disorder and suggested by a doctor to monitor some health parameters, then it is fine to use such device. It's my personal opinion that the smart gadgets' use should be justified.

Wearable gadgets, or any technology for that matter, should be used as to enhance our lives, not to control it.

All the best students for your future endeavors!

They know you better!
Gayatri Savarkar, SY Entc

Generally, when we speak about wearable devices, we think of smartwatches, fitness trackers, and futuristic gizmos. However, wearable gadgets are actually not that new. Look around, wristwatches and hearing aids have been around for decades now. These are gadgets - pieces of technology - and can be worn on our body. What makes a wristwatch different from a smartwatch? Would a watch that displays time on an LCD screen be considered a smartwatch? Not really. All it does is display time, and doesn't offer anything much better than a watch with a dial and hands. What makes a smart gadget "smart" is its ability to collect, store, manipulate and share the new gold - data! Now on, whenever you see the terms wearable gadget, wearable device or something of that sort in this article - remember that we are discussing gadgets which can store, process and share data and can be worn on our body.

Wearable gadgets are apparently the next big revolution in technology, and like every other disruptive technology, there are some not-so-beneficial aspects to it. As we transition to a new world full of interesting possibilities, it is worthwhile to take a moment and think about safety concerns around the new technology. A recent incident in Rajasthan was particularly eye-opening and got me thinking. The 2021 edition of Rajasthan Eligibility Examination for Teachers saw a whopping 16 lakh candidates appear for the test, at more than 4000 centers across the state. Internet services in the state were suspended from 6am to 6pm that day, to prevent malpractices.

They know you better!

A candidate was caught using a Bluetooth enabled slipper with a sim card and earpieces, yes you read it right – a slipper – to copy. These slippers cost up to Rs. 6 lakh each, and were being sold by a racket across Rajasthan. The slippers are clearly wearable, and are able to transmit, receive data and connect to other devices – 'smart' enough! We need not extend our imagination much further to see the concerns around wearable gadgets. Modern wearables, even those currently available in the market, can easily surpass high-end spying devices used a few decades ago.

Many wearables available today are centered around health and fitness. Be it smart watches, fitness bands, tech tattoos or fitness rings – all are loaded with sensors to monitor your heart rate, sleep, physical activity and so on. Though specific features vary from device to device, one thing is common – they all collect a lot of personal data, or in other words, they know a lot about the user. This data can be used for targeted advertising, or tracking an individual. When such data is collected from multiple users at a time, surprising things can happen – like an army base being exposed!

In November 2017, Strava, a fitness tracking service, released a 'heatmap', a visualization of all activity recorded by all users on Strava. Routes used by a large number of people glowed bright on a dark background. In the Helmand province of Afghanistan, some bright spots showed up on an otherwise dark background- exposing some US military bases.
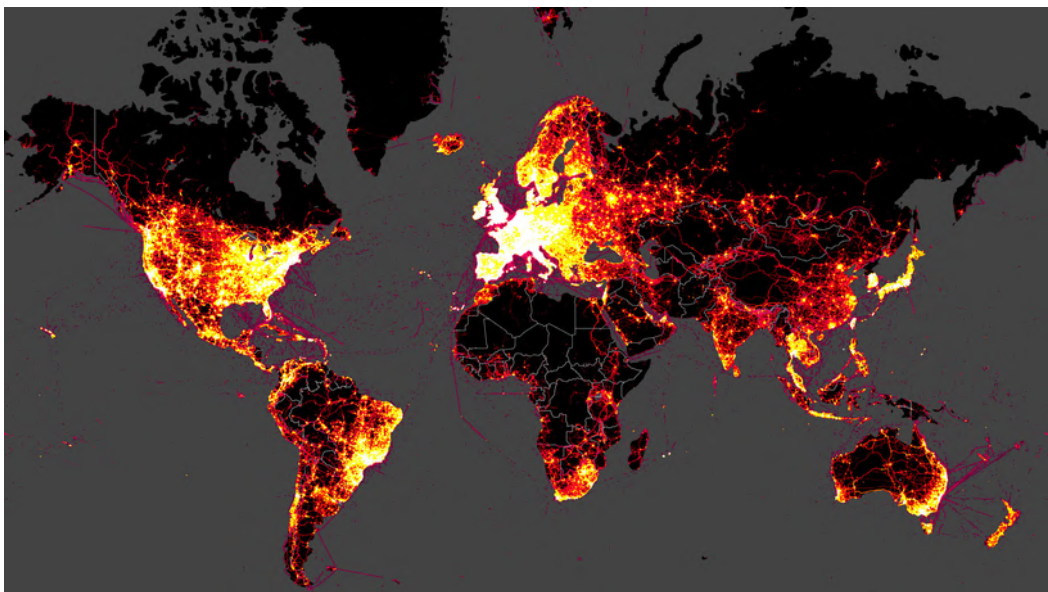
Zooming in on these spots also shows the internal structure of the military facilities and the movement of personnel within the facility. In remote locations and warzones, the only users for fitness trackers are foreign military personnel. This means that military establishments can be easily identified and one can track the trails of all its users in great detail. The Pentagon sees this as a security risk and is considering whether it needs to set up protocols around the use of tracking devices by the military.

These two incidents highlight the fact that wearable technologies need to be used with great care. Data gathered by wearables is usually stored in the device for a while, then saved in the user's smartphone and eventually uploaded to a cloud or server. The transfer of data from gadget to smartphone usually happens over Bluetooth, Wi-Fi or NFC. In all these cases, the security of these wireless channels is not enough to protect against well-versed hackers. Although a breach of fitness tracking data may seem trivial, it may turn out really bad.

Fitness trackers are available in the market to track everything from steps taken, heart rate to menstrual cycles. All of this data can be used to identify you personally, to know your strengths and weaknesses. Analysts can observe your schedules, where you are at what time of the day, and so on. Fine, so what if my data is put up on the cloud? Why should I be concerned? – Let's look at it through an analogy with familiar technology.

Consider popular e-commerce companies like Amazon. They have huge databases which can answer questions like "How popular is a particular brand of footwear among Indians of working age?", "Which features are most sought after in smartphones?" and other very specific questions. A lot of times, such data is used to analyze demand, consumer behavior and other kinds of market research. If someone were to get access to your shopping history, it is possible to correlate it with trends in the database and infer your country, approximate age, city, gender and other information.

You might have noticed, if you search for a product on google a few times, you get ads for that product on multiple sites that you visit. These are called targeted ads – ads that you are probably interested in; ads that you are more likely to click on. This kind of advertising attracts lots of money, meaning more revenue for the website. For them, the user is a sample in some huge database, a source of more data for more analysis and targeting.

Besides targeted adverts, this data can be used by enforcement agencies, companies or other 'big brothers' to keep a watch on people and influence their behavior. Insurance companies for instance can use fitness tracking data to show how a person did not follow a healthy lifestyle and hence deny the Mediclaim, or to increase the premium one has to pay for the same.

With wearables, the kind of data available with these companies will be a lot more detailed, and can be used to draw much more accurate inferences. This makes maintaining secrets even harder for companies, government offices and even intelligence services. Currently, some workspaces require employees and visitors to surrender their mobile phones and other gadgets outside before entering the actual workspace. Getting spying devices inside these secretive spaces would become easy, which means important information becomes easier to leak.

Although there are all these concerns around wearable gadgets, this is not intended to be a rant against the technology. Wearables have a lot of expectations to live up to – the technology looks promising and the future, exciting! One must, however, be careful about how these gadgets are used.

Health effects of wearable jewelry

Himani Antad, TY Entc

We will be living in an era in which, as Astro Teller said, "Doing exercise without monitoring yourself will be rare in the future of wearable technology"

In this article I will cover some major cons of such wearable technologies which might be tempting to wear for most of us at first sight or might be the most valuable healthcare purchases for some too! Now let's face the real question which remains; are you vigilant enough to see the possible dangers that come complimentary with them ?
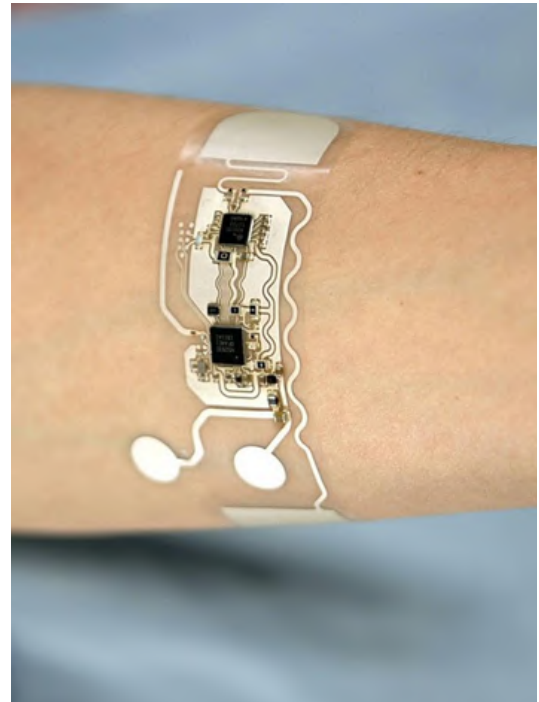
The term "Wearable technology" is a type of technological device that can be worn comfortably on the body, either as an accessory or as part of clothing. Such devices for the benefit of Humans usually include a tracking feature having motion sensors which tracks information or collect data related to health and fitness of its user synchronizing it with other mobile devices forming the user's personal health ledger. Wearable technological devices have been included in various accessories, including glasses, rings, watches, dresses, jackets, shirts, shoes, earrings, necklaces, and bracelets. Such valuable inventions have proved to be life-saving for some but is it benefitting all age-groups equally? to make it a part of our daily lives and most importantly will they be adjusting to varied human body temperatures of us living in different climates on earth ?

No doubt that such devices enhance human productivity to a considerable extent and tracks health and fitness as part of their wellness programs but let's draw our attention to some other aspects before making them a habit to wear

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Health effects of wearable jewelry

1. Exposure to harmful radiations and other Health risks :

Wearable devices use RF transmitters to send and receive data information which emits non-ionizing radiation according to Centers for Disease Control and Prevention (CDC) .They use Bluetooth and Wi-Fi and must comply with Federal Communications Commission(FCC) regulations, but unfortunately these safety standards are neglected by many companies exposing us to varied potential health hazards – like long-term exposure health damaging effects related to brain or nervous system of individuals or putting children's growth and development aspects under risks as they tend to be more sensitive to EM radiations to the risks of miscarriages among women and reduced fertility among men . Other minor effects include headaches and dizziness.

2. Privacy concerns :

For us Privacy is priority thereby encryption is needed. Ensuring secure private data is valued by most of us today and if we introduce new technologies into the business which threatens to invade our privacy then it is not acceptable socially which may involve third party interests which should be prohibited by law .

Therefore , it's essential to first assess the potential impact it will have on the whole Human Society for it to work effectively after being trusted upon .App providers should refrain from sharing user's health statistics with any third party organizations and upon leaking data must face the Legal centers.

3. Extravagant prices of Wearables :

Wearables are generally kept compact and efficient in size yet fashionable .This attribute of compactness costs dearly to companies while designing the essential IC chips ,etc. As a result, it inflates the prices of these accessories which are rarely pocket friendly among masses. Sometimes , they are not independent enough to stand alone for proper functioning and need other platforms or wearables as support systems .

4. Battery size and functioning hours limitations :

More technological advancements and constant critical research are an inevitable part of this business to bring in cost efficiency along with structural compactness of the product including improved battery life and less charging hours in order to make them durable and resilient.

5. Inaccurate and insufficient data monitoring :

Such inaccuracies in data capturing when added-up produce an entirely different health statics of a user than it may have been otherwise when accurate data was precisely entered on time .For example if it majors high sugar-levels due to some technical issues for a diabetic user then it maybe of great deal for him/her rising his/her concerns and adding unwanted mental stress to their peaceful lives .

Lastly ,when all such aspects are carefully taken into account by companies and they come-up with required solutions or alternatives I believe wearable technologies will be boon for us but for now let's use them wisely when necessary or under inevitable conditions and availing benefits appropriately.
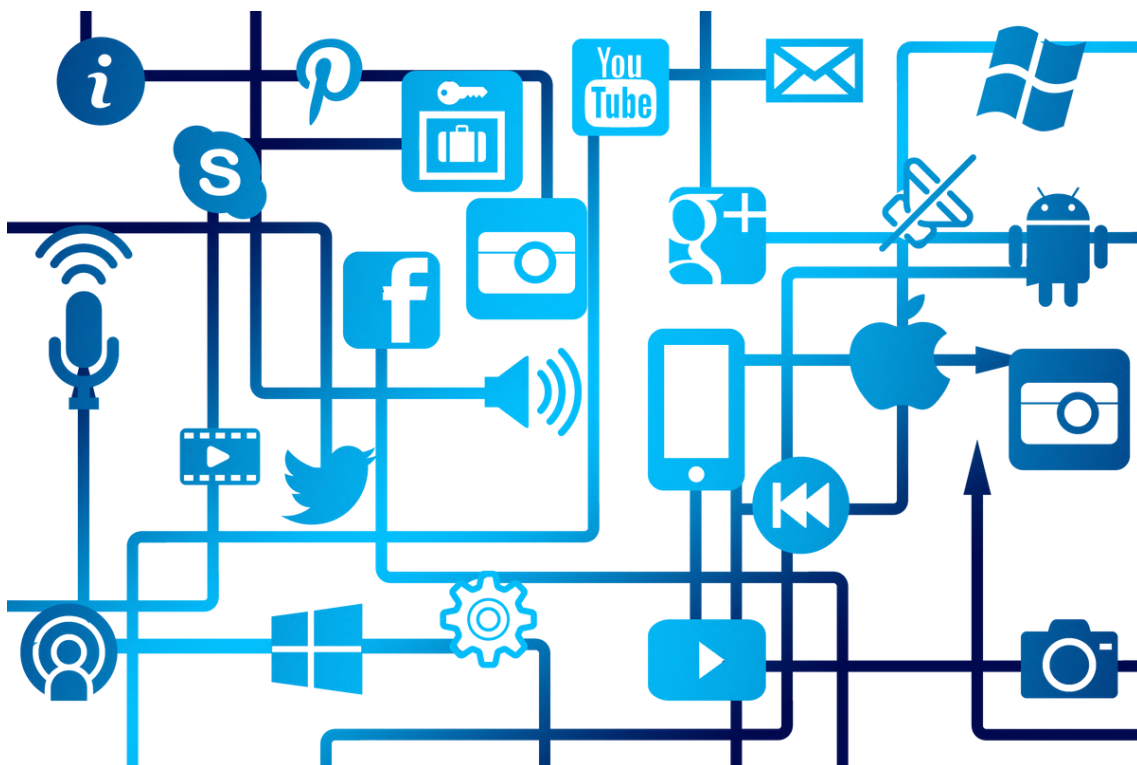
Will the smartphone be replaced?

Srishty Kumari, TY Entc

What exactly comes to your mind, when you think about this question?

Most people will think that this is impossible but let me tell you, the answer to this question is YES, the smartphone will get replaced in the future cause we people like to carry less around.

As we all know, first the camera was invented and then came the smartphone.
Have you ever wondered why smartphones have a camera when we already have actual cameras for the same function? Well, it's because cameras were not easily operable by everyone and they were expensive, which meant not everyone could afford it. Also, carrying a camera around everywhere to capture a moment seems impractical as compared to carrying a phone which can perform the same function in a lesser period of time.

Even with these advancements, people don't even prefer to carry phones since it's kind of burdensome to take the phone out on public transport amidst the crowd and rush. With that in mind, the tech industry is coming up with new technology which enables consumers to travel phone-less, like the smartwatch. The smartwatch not only provides the user with its basic function of telling time but also serves the purpose of a smartphone. With technology advancing everyday we can expect to see many more such wearable gadgets in the coming few years!

Wearable technology are smart electronic devices (electronic device with microcontrollers) that are worn close to and/or on the surface of the skin, where they detect, analyze, and transmit information concerning example body signals such as vital signs, and/or ambient data and which allow in some cases immediate biofeedback to the wearer.

There is a huge variety of wearable devices including smart watches, smart glasses, smart clothing, fitness trackers, body sensors, wearable cameras etc. Nevertheless, there is no generally accepted classification of wearables. So in this article, we will talk about smart glasses and their future.

Superimposing information onto a field of view is achieved through an optical head mounted display (OHMD) or embedded wireless glasses with transparent heads-up display (HUD) or augmented reality (AR) overlay. These systems have the capability to reflect projected digital images as well as allowing the user to see through it or see better with it. While early models can perform basic tasks, such as serving as a frontend display for a remote system, as in the case of smart glasses utilizing cellular technology or Wi-Fi, modern smart glasses are effectively wearable computers which can run self contained mobile apps. Some are handsfree and can communicate with the Internet via natural language voice commands, while others use touch buttons.

Smart glasses could be used as a body camera. In 2018, Chinese police in Zhengzhou and Beijing were using smart glasses to take photos which are compared against a government database using facial recognition to identify suspects, retrieve an address, and track people moving beyond their home areas.

The most prominent application for smart glasses today is most definitely video collaboration. The ability to work together with experts remotely in a "see-what-I-see" system is improving many sectors across the board. Applicable from field service to complex engineering support, remote assistance functionality makes more companies incorporate the smart glasses technology into their workflows.

The current use of smart glasses is convincing more and more forward-thinking businesses to hop on board. Although the widespread public usage is still pending, smart glasses have found valuable areas to operate, develop, and grow. So helpful that it is not surprising to hear that tech giants like Apple, Facebook, and Samsung are working on their AR-powered smart glasses.

Imagine being able to update the knowledge you need directly to an eyewear database. This scenario allows a hands-free workforce with instant access to targeted knowledge directly in their field of view. Such an implementation would ultimately increase quality control, improve maintenance, provide faster and more reliable solutions, save money on management and training, facilitate remote assistance, to name a few.

Until mass-market glasses finally hit the stores, this eyewear technology will continue doing its magic behind the curtains hidden in facilities, warehouses, and construction sites worldwide.

Bringing the Past Back To the Future
Aditi Singhal, SY Entc

It's been 37 years since the iconic Marty McFly landed on the silver screens to wrap you up in his charisma. Yes, I am talking about the most iconic Hollywood Franchise-Back To The Future!

Back to the Future is the smash-hit blockbuster that started one of the most beloved franchises of all time. 1985's "Back to the Future" centres on the story of Marty McFly, a high school student from Hill Valley, CA who dreams of making a huge impression on the public with his music-playing abilities, especially with his girlfriend Jennifer. He's also good friends with the eccentric Doc Brown (Christopher Lloyd), who has just invented a time machine out of a DeLorean. After the experiment goes wrong, Marty McFly is sent back to the year 1955. The rest is history. The movie has developed an iconic status with amazing dialogues, and magnificent tech

The technology that this has predicted in 1985 is, to say the least, very interesting. For instance, let's take the self-lacing sneakers. That was a revolutionary concept in itself. However hypothetical they may seem, Nike did assure us that this idea is going to be implemented in 2015. Regardless, the idea was a sure sellout. Back to the Future also suggested the idea of augmented reality through wearable technology that is so common nowadays, such as receiving a phone call through spectacles or glasses.

Tech restrictions along with resource constraints have limited wearable technology for quite some time, but tech is paving way for new ideas now. Smart textiles are one of the starting points. As many of you will already have read, Google announced Project

Jacquard in partnership with Levi's earlier, ahead of market release in 2016. This is a conductive yarn that will allow touch interactivity on the fabric itself. It's a bid to free us from using our mobile phones all the time by enabling simple functionalities like taking a selfie, turning a lightbulb on and off, and more.

This one isn't a new one – Tommy Hilfiger released a jacket last year that featured solar panels on the back of it leading to a portable battery pack that mobile phones and tablets could be plugged into. Then there are designers like Pauline van Dongen, who has integrated solar cells into highly wearable t-shirt designs. In the future, kinetic energy from our bodies will be increasingly utilised too. And of course, the health and fitness world will also continue to have a big impact on our uptake of wearables, especially as more fashion companies get involved, like Ralph Lauren has. Its PoloTech T-shirt, which launched to the public in August 2015, incorporates a conductive silver-coated thread that allows the wearer to capture biometric information including their heart rate, breathing, steps and more.

Smart Wearables has a gigantic scope and will pave the way for mind-boggling inventions. Let us just wait and watch the spellbinding world of tech captivate us with the marvellous ideologies that are yet to come.

Podcast and book recommendations
Lopa Chaudhari, Final Year Entc

Podcasts:

Security Now
From important happenings to expert analysis and tips, this podcast gives the everyday user some great direction in security knowledge and practice.

Spark with Nora Young
Subjects covered can range greatly from artificial intelligence in vehicles to smartphone programming and the use of computer sciences in the financial industry.

Rabbit Hole
The New York Times' tech columnist, Kevin Roose, explores exactly how the internet has come to dominate much of our daily lives, and where it could be headed in the future.

This Developer's Life
If you pursue a career as a developer, what types of hurdles do you think you could face? From questions around ethics to sheer practicality, you'd be surprised at how many 'problems' can arise during projects.

Books to rebuilt Ourselves:

Atomic Habits: An Easy & Proven Way to Build Good Habits & Break Bad Ones
By: James Clear
The 4-Hour Workweek
By: Tim Ferriss
Make it Stick
By: Henry L. Roediger III, Mark A. McDaniel, and Peter C Brown
The Psychology of Money
By: Morgan Housel
Keep Going: 10 Ways to Stay Creative in Good Times and Bad
By: Austin Kleon

Puzzle Time!
Srishty Kumari, TY Entc

R	B	V	W	Z	L	S	I	D	I	W	A	T	M	S
E	F	G	C	A	P	A	C	I	T	O	R	B	U	D
S	O	Y	T	R	A	D	H	K	J	A	O	G	L	I
I	A	E	N	D	U	J	P	T	N	E	T	L	T	O
S	X	F	P	U	Z	M	A	S	U	X	C	W	I	D
T	I	B	O	I	Z	Q	F	J	H	G	U	A	M	E
O	C	U	N	N	D	O	V	U	K	Y	D	U	E	P
R	Q	Z	R	O	R	P	C	L	G	Z	N	X	T	A
D	R	Z	B	M	N	A	E	I	A	W	I	V	E	F
F	X	E	E	B	H	M	R	T	M	S	T	S	R	X
T	C	R	S	C	L	P	M	S	A	C	P	Y	N	K
E	V	S	T	J	A	E	P	H	H	G	F	A	X	B
N	J	I	O	P	Z	I	C	K	N	T	J	L	F	W
U	W	T	R	A	N	S	I	S	T	O	R	E	E	Y
S	E	M	I	C	O	N	D	U	C	T	O	R	S	I

Word To Be Found:

Resistor   Multimeter   Capacitor   Transformer
Transistor   Switch   Diode   TRX   OPAMP   Switch
Relay   Inductor   Semiconductor   Buzzer

Faculty Awards 2020-2021

S. No.	Name of Faculty	Name of Award	Received from Body
1.	Dr. Prachi Mukherji	International Academic Leader Award 2020-21	International Institute of organized Research (I2OR)
		Best Teaching Award 2021	Asian Education Awards, India
		Professor of the year Award 2020	Center for Education Growth and Research (CEGR), India
2.	Dr. Sharada Ohatkar	The Best Women award for innovative technology in teaching	Genesin of Educational Impressions, Roorkee
		Letter of Appreciation, Swayam NPTEL Local Chapter CUMMINS COLLEGE OF ENGINEERING FOR WOMEN, as a Single Point of Contact (SPOC) during the Jan-Apr 2020 semester.	SWAYAM-NPTEL

3.	Dr. Ashwini M. Deshpande	Outstanding Women Award for Research Project of the Year	Outstanding Women Award for Research Project of the Year
4.	Dr. Anita Jain	Silver faculty certification-'Start Me Up Awards Ceremony' Global Jury and NEN Faculty recognition	Wadhwani Foundation
5.	Dr. Mrudul Dixit	Road accident analysis using Random Forest Algorithm-BTech Project Group Best Paper Presentation in the 4th International Conference (Online) on Recent Trends in Communication & Electronics (ICCE-2020), Ghaziabad (Hand Gesture Recognition using Deep Learning - BTech Project Group 2nd prize for Best Oral presentation at International Conference on Computational Intelligence in Engineering Systems (ICCIES-2021)	

Placements 2020-2021

Sr. No	Company Name	No. of Students	Package (in Lakhs)
1	Walmart Labs	01	20.67
2	SAP Labs India	01	20.6
3	Deutsche Bank	03	19.63
4	WDC	01	19.5
5	Xilinx	02	17.5
6	Micron	04	14
7	Citi	12	13.7
8	BNY Mellon	01	11
9	Oracle	07	11
10	Veritas	01	10.75
11	Mastercard	02	9.69
12	RBL	01	9

Sr. No	Company Name	No. of Students	Package (in Lakhs)
13	Siemens PLM	02	9
14	Symbl.ai	01	9
15	ZS Asso	02	8.93
16	Schlumberger	01	8.8
17	Athenahealth	01	8.5
18	PwC	05	8.4
19	Michelin	10	8.2
20	Dell	01	8
21	Addverb	01	7.59
22	Fractal Analytics	01	7.5
23	Conde'Nast	01	7
24	Incedo	01	7

Sr. No	Company Name	No. of Students	Package (in Lakhs)
25	Alstom	01	6.5
26	Schneider Electric	01	6.5
27	SE2	01	6.5
28	Eaton	02	6.25
29	Standard Chartered	03	6.1
30	Smiths Detection	01	6
31	Rockwell Automation	02	5.2
32	NO Broker	01	5.16
33	Amdocs	13	5
34	BHTC India	02	5
35	Siemens Ltd	01	5
36	Varroc	02	5

Sr. No	Company Name	No. of Students	Package (in Lakhs)
37	Volkswagen	01	5
38	Accenture	16	4.5
39	Amazon	01	4.5
40	Brillio	05	4.5
41	Ericsson	07	4.5
42	Persistent	05	4.5

Department of Electronics and Telecommunication
Faculty Paper Publication 2020-21

Research Publications in AY 2020 - 2021

1. Conference Papers Published: 10

2. Scopus Indexed Conference Papers: 09

3. Conference Papers at International Level : 01

4. Journal Papers Published: 32

5. Scopus Indexed Journal Papers: 07

6. SCI/WOS Indexed Journal Papers: 06

7. Journal Papers at International Level: 19

Sr No.	Author	Name of Journal/ Conference	Title of paper	SCI/ Scopus/ UGC listed/ Other	Volume no., Issue No.	Page nos.	Month and year of publication	ISSN/ ISBN no. and DOI	Impact factor	Journal 1H index
1	Prof. Madhuri Khambete and Mrs. Manasi Pathade	International Journal of Image and Graphics	Supervised Method for Congestion Detection at Entry and Exit Corridors of Public Place	Scopus	Vol. 21, No. 1	2150019 1-1 to 2150019-16	Oct 2020	ISSN: 0219-4678	0.9	20
2	Prof. Prachi Mukherji, Dr. Sachin Paranjape	International Journal of Communication Systems	Bio-inspired Hybrid Algorithm to Optimize Pilot Tone Positions in Polar-code based OFDM-IDMA System	SCIE	Vol. 34, No. 3	15	6 Dec 2020	Journal ISSN : 1074-5351 journal e-ISSN: 1099-1131 DOI 10.1002/dac.4676		
3	Prof. Prachi Mukherji and Mr. Mahesh Pote	International Journal of Advanced Science and Technology (IJAST)	Design of Microstrip Patch Antenna using Defected Ground Structure for WiMAX Application	Scopus	Vol. 29, No. 8	pp. 5299 - 5311	2020	ISSN: 2005-4238		
4	Prof. Prachi Mukherji	2020 International Conference on Wireless Communications Signal Processing and Networking (WiSPNET)	Temporal Feature Extraction for Improving Myoelectric based Recognition of Prosthetic Hand	Scopus		67-71	2020	978-1-7281-5284-4/20/$31.00 and DOI: 10.1109/WiSPNET48689.2020.9198476		

Sr No.	Author	Name of Journal/ Conference	Title of paper	SCI/ Scopus/ UGC listed/ Other	Volume no., Issue No.	Page nos.	Month and year of publicat -ion	ISSN/ ISBN no. and DOI	Impact factor	Journa l 1H index
5	Prof. Prachi Mukherji and Mr. Mahesh Pote	Solid State Technology	Inverted arrow Shaped Microstrip Patch Antenna using Defected Ground Structure for Modern Wireless Communication	Scopus Indexed Journal	Vol. 63 Issue: 6	21500 191-1 to 21500 19-16	2020	ISSN: 0219-4678	0.11	25
6	Prof. Prachi Mukherji	International Research Journal of Engineering and Technology (IRJET)	Improved performance of antenna using DGS for 5G applications	Other	Vol 7, Issue 9	pp. 378-382	Sept 2020	e-ISSN: 2395-0056 p-ISSN: 2395-0072	529	
7	Prof. Sharada Ohatkar	International Journal of Research and Analytical Reviews	IJRAR		Spatial Modulation for Future Wireless Network	UGC	Vol 8, Issue 1	pp 236 - 241	Jan 2021	E-ISSN 2348-1269, P-ISSN 2349-5138, DOI: 10.6084/ m9.doi.on e.IJRARJF M1031	5.75	
8	Prof. Sandeep Musale Amitkumar S. Khade, Ravikant Suryawanshi	Analog Integrated Circuits and Signal Processing	A DTMOS-based power efficient recycling folded cascade operational transconductan ce amplifier	Springe r SCI	107	227–238 (2021)	April 2021	https://do i.org/10.1 007/s104 70-021-01809-y		

Sr No.	Author	Name of Journal/ Conference	Title of paper	SCI/ Scopus/ UGC listed/ Other	Volume no., Issue No.	Page nos.	Month and year of publicat-ion	ISSN/ ISBN no. and DOI	Impact factor	Journal 1H index
9	Dr. Ashwini Deshpande	International Conference on Signal and Data Processing ICSDP-2019, MITAOE, Alandi, Pune	Comparative Analysis of Least Squares method and Extended Kalman filter for Position Estimation in GPS Receiver	Scopus Conference	Lecture Notes in Electrical Engineering book series	pp. 389-403	12 Jan 2021	DOI: 10.10 07/97 8- 981- 15- 8391- 9_29	0.9	20
10	Dr.Anita Patil	International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)	Heart-Rate Variability Estimation Using Photoplethysmography Signal	Other	Vol 9, Issue 2, Sept 2020	78	Sept 2020	ISSN No: 2581-9429	5.94	
11	Dr. Megha Borse	International Journal of Advanced Science and Technology (IJAST)	Detection based on multi band EEG Transmission network instability, mature & smart sleep apnea	Scopus	Vol 29, Issue No.4,	pp. 6842 – 6852	Aug 2020	ISSN: 2005-4238	0.41	
12	Dr. Bageshree Pathak	International Journal of Engineering Research & Technology (IJERT)	Comprehensive Study of Software Testing Techniques and Strategies: A Review	Other	Vol. 9 Issue 08		Aug 2022	ISSN: 2278-0181	7.87	

Sr No.	Author	Name of Journal/ Conference	Title of paper	SCI/ Scopus/ UGC listed/ Other	Volume no., Issue No.	Page nos.	Month and year of publicat-ion	ISSN/ ISBN no. and DOI	Impact factor	Journal 1H index
13	Dr. Bageshree Pathak	International Journal of Latest Trends in Engineering and Technology	International Journal of Latest Trends in Engineering and Technology	Other	Vol. (17) Issue(3) pp.041-044	041-044	Sept 2020	e-ISSN: 2278-621X DOI: http://dx.doi.org/10.21172/1.173.06	4.49/10	25
14	Dr. Bageshree Pathak	8 th International Conference on Innovations in Computer Science & Engineering (ICICSE-2020 – Virtual Conference)	Comparison between CNN and RNN techniques for Stress Detection using Speech	Scopus Conference		26	Date of Confe-rence: Aug 28th & 29th, 2020	ISSN:2367-3370 eBook ISBN 978-981-334-543-0 DOI 10.1007/978-981-33-4543-0		
15	Dr. Bageshree Pathak	3rd International Conference on Communication, Circuits, and Systems (iC3S 2020),Kalinga Institute of Industrial Technology (KIIT), Bhubhaneshwar, India.	Comparison between LSTM and RNN Algorithm for Speech to Speech Translator	Scopus Conference	Lecture Notes in Electrical Engineering 728 pg no 15-23		16 – 18 Oct 2020	Print ISBN: 978-981-334-865-3 Electronic ISBN: 978-981-334-866-0		

Sr No.	Author	Name of Journal/ Conference	Title of paper	SCI/ Scopus / UGC listed/ Other	Volume no., Issue No.	Page nos.	Month and year of publicat-ion	ISSN/ ISBN no. and DOI	Impact factor	Journal 1H index
16	Dr. Mrudul Dixit	4th International Conference on Recent Trends Communication & Electronics (ICCE-20)	Road accident analysis using Random forest algorithm	Scopus Conference			28th and 29th, Nov 2020	eBook ISBN:9 781003 193838		
17	Ms. Vidya Sisale	International Engineering Research Journal	Human detection and rescue system by ROBOT	Other	Vol. 3 , Issue 4	Page 6462-6464,	Sept 2020	ISSN: 2395-1621		
18	Mr. Sagar Vanarase	International Journal of Scientific & Engineering Research	Acoustic Release using Fusible Link	Other	Volume 11, Issue 8		Aug 2020	ISSN: 2229-5518		
19	Mrs. Ratnaprabha Borhade	Biocybernetics and Biomedical Engineering-Elsevier	Modified Atom Search Optimization-based Deep Recurrent Neural Network for epileptic seizure prediction using electroencephalogram signals	SCI	Volume 40, Issue 4	1653	Oct-Dec 2020	ISSN: 0208-5216	2.537	22
20	Mr.Ganesh Padalkar	2021 International Conference on Computer Communication and Informatics (ICCCI)	Drug Discovery using Generative Adversarial Network with Reinforcement Learning	Scopus Conference			Date of Conference:27-29 Jan. 2021 Pub date:21 April 2021			

Sr No.	Author	Name of Journal/ Conference	Title of paper	SCI/ Scopus/ UGC listed/ Other	Volume no., Issue No.	Page nos.	Month and year of publicat-ion	ISSN/ ISBN no. and DOI	Impact factor	Journal 1H index
21	Dr. Ashwini Deshpa nde	IEEE Pune Section International Conference (PuneCon)	A Smart Early Warning System for Disease Outbreak with a Case Study of COVID-19	Scopus Conference		Page: 113-118	March 2020	10.1109/ Pu neCon5 086 8.2020. 936 2380	NA	NA
22	Mrs. Rupali Pawar	International Conference on Advances in Artificial Intelligence and Data Engineering Part of the Advances in Intelligent Systems and Computing book series (AISC, volume 1133)	LSB and RLE based approach for increasing payload and security of stego images	Scopus Conference			August 2020	Print ISBN97 8-981-15-3513-0 Online ISBN 978-981-15-3514-7		
23	Dr. Ashwini Deshpa nde	ICTACT Journal on Image and Video Processing	Shadow detection from aerial Imagery with morphological preprocessin g and pixel clustering methods	UGC Care List	VOLU ME : 11, ISSUE: 03, PP-2385-2390	PP-2385-2390	February 2021	ISSN: 0976-9102 (ONLIN E)		

Sr No.	Author	Name of Journal/ Conference	Title of paper	SCI/ Scopus/ UGC listed/ Other	Volume no., Issue No.	Page nos.	Month and year of publicat-ion	ISSN/ ISBN no. and DOI	Impact factor	Journal 1H index
24	Prof. Sharada Ohatkar	GRADIVA REVIEW JOURNAL	"Acoustic mobile camera for Sound Localization"	UGC - Group2	Volume 7 Issue 6	pp 194-202	2021	ISSN NO : 0363-8057		
25	Dr. Mrudul Dixit	International Conference on Computational Intelligence in Engineering Systems (ICCIES-2021)	Hand Gesture Recognition using Deep Learning *** Best Presentation 2nd Rank	Scopus, Springer, WoS			Con Date:25-26 June 2020	ISSN 2511-2111		
26	Dr. Mrudul Dixit	International Conference on Computational Intelligence in Engineering Systems (ICCIES-2021)	Machine Learning based Sentiment Analysis of Twitter Data	Scopus, Springer, WoS			Con Date:25-26 June 2021	ISSN 2511-2112		
27	Mrs.Pallavi Ghatkamble	International Journal of Advanced Science and Technology	Interactive Mirror using Raspberry Pi	Other	Vol 29, No 8	pp. 5344 - 5350	2020	ISSN:2 005 -4238 IJAST		
28	Mrs.Pallavi Ghatkamble	International Journal of Engineering Research and Technology	Virtual Vigilance System	Other	Vol 10, Issue 6	613-618	6 June 2021	ISSN 2278 - 0181		

Sr No.	Author	Name of Journal/ Conference	Title of paper	SCI/ Scopus/ UGC listed/ Other	Volume no., Issue No.	Page nos.	Month and year of publicat- ion	ISSN/ ISBN no. and DOI	Impact factor	Jour nal 1H inde x
29	Mrs.Pallavi Ghatkamble (BTech Student Project group)	International Journal of Advanced Research in Computer and Communicat ion Engineering	Android Based Patient Health Monitoring System	Other	Vol 10, Issue 6	154-158	June 2021	ISSN(ONL INE) 2278-1021 ISSN (PRINT) 2219-5940 DOI 10.17148 /I JARCCE.2 021.1063 3	7.078	
30	Dr. Bageshree Pathak	INTERNAT IONAL JOURNAL OF CREATIVE RESEARCH THOUGHT S - IJCRT	Classificatio n of Anxiety Disorder and Depression Disorder from EEG using SVM	Other	Volume 9, Issue 6, June 2021	f817-f821	June 2021	ISSN No-2320-2882	7.97	
31	Dr. Bageshree Pathak	The International journal of analytical and experimental modal analysis	Seizure Detection from EEG Signals using Wavelets and Three Different Classifiers	UGC - Group2	Vol 13, Issue 6	Page No: 2507-2514	June 2021	ISSN NO:088 6-9367	6.3	

Sr No.	Author	Name of Journal/ Conference	Title of paper	SCI/ Scopus/ UGC listed/ Other	Volume no., Issue No.	Page nos.	Month and year of publicat- ion	ISSN/ ISBN no. and DOI	Impact factor	Journa l 1H index
32	Dr. Bageshre e Pathak	GRADIVA REVIEW JOURNAL	Design and Implementation of Human Lie Detector using Polygraph for Stressful Situations using four Biomedical Sensors	UGC - Group2	VOLUM E 7 ISSUE 6	508-516	June 2021	ISSN NO : 0363-8057 ISO No- 7021-2008	6.1	
33	Dr. Mrudul Dixit	International Journal of Science and Research (IJSR)	CREDIT CARD FRAUD DETECTIO N USING BAGGING AND BOOSTING ALGORITH MS	UGC(ISO 9001:20 0 8 Certified Journal)	Volume : 07 Issue: 05	7402-7406	May 2020	e-ISSN: 2395-0056 p-ISSN: 2395-0072	7.529	
34	Dr. Shubhan gi Chaudhar y	International Journal of Advanced Research in Computer and Communicat ion Engineering	Health Monitoring System	-	Vol. 10, Issue 6, June 2021	543-545	June 2021	ISSN (Online) 2278-1021 ISSN (Print) 2319-5940, DOI 10.17148/I JARCCE.2 021.106114	7.078	29

Sr No.	Author	Name of Journal/ Conference	Title of paper	SCI/ Scopus / UGC listed/ Other	Volume no., Issue No.	Page nos.	Month and year of publicat-ion	ISSN/ ISBN no. and DOI	Impact factor	Journal 1H index
35	Mr.S. L. Sahare	International Journal of Engineering Research & Technology (IJERT)	Smart Stick for Visually Impaired	UGC-Group3	Volume 10, Issue 6	196-198	June 2021	ISSN:2278-0181		
36	Ms. Vidya Sisale	International Journal of Engineering Research & Technology (IJERT)	An Intelligent Coin Dispensing Machine with Fake Note Detection	Other	Vol. 10 Issue 05,	529-533	May 2021	ISSN: 2278-0181	7.87	

PAPER PRESENTATION :

In the year 2020-21, 3 students won at international level and total 43 students of the program presented papers at various national and international level journals and conferences.

List of winners are :

Sr No.	NAME OF THE STUDENT	TITLE OF THE PAPER/EVENT	MONTH AND YEAR	WITHIN STATE/NATIONAL LEVEL/ INTERNATIONAL LEVEL PUBLICATION OR JOURNAL OR EVENT	ORGANISING INSTITUTE	PRIZE/ AWARD
1.	Gayatri Amrutkar	Hand gesture recognizing using deep learning.	2021	ICCIES Conference-2021	SKN COE, Pandharpur	Oral presentation 2 nd rank
2.	Manasi Shinde	Hand gesture recognizing using deep learning.	2021	ICCIES Conference-2021	SKN COE, Pandharpur	Oral presentation 2 nd rank
3.	Kalyani Thattekar	Hand gesture recognizing using deep learning.	2021	ICCIES Conference-2021	SKN COE, Pandharpur	Oral presentation 2 nd rank

PROJECT COMPETITION :

In the year 2021-22, 4 students won at international level and 1 student won at national level and total 6 students participated in various project competitions.

List of winners are :

SR. NO	NAME OF THE STUDENT	NAME OF EVENT IN WHICH PARTICIPATED	MONTH AND YEAR	WITHIN STATE/ NATIONAL LEVEL/ INTERNATIONAL LEVEL	ORGANISING INSTITUTE	PRIZE/ AWARD
1.	Sanchi Wakde	Elected for Semi Finals in **'Ericsson Innovation Awards 2020'**	2020	International	Ericsson	1000 Euros
2.	Gunjan Mohod	Elected for Semi Finals in **'Ericsson Innovation Awards 2020'**	2020	International	Ericsson	1000 Euros
3.	Somya Gupta	Elected for Semi Finals in **'Ericsson Innovation Awards 2020'**	2020	International	Ericsson	1000 Euros
4.	Chanchal Choudhary	Received a grant of 5000 USD for a gaming lens that she had created as a part of Snap AR Gaming Residency. It was a global program. She received the grant after completing the program and successfully hosting the lens on Snapchat.	2021	International	Snap AR Residency program, US	5000 USD
5.	Priyanka Mungale	Innovation Award 2020 for project Robot to Unlog Sewage Channels	2020	National	Natarajan Education Society	Innovation Award 2020

SEMINARS/ WORKSHOPS/ CONFERENCES :

In the year 2021-22, 3 students participated in various seminars, workshops and conferences within international and national level.

Details of participants :

SR. NO	NAME OF THE STUDENT	NAME OF EVENT IN WHICH PARTICIPATED	MONTH AND YEAR	WITH IN STATE/ NATIONAL LEVEL/ INTERNATIONAL LEVEL	ORGANISING INSTITUTE
1.	Charushila Bhadane	2 days live Workshop on Javascript	12-13 th June 2021	National	Linux world
2.	Shruti Bharat	Open Source 101 Webinar	16 th January 2021	National	Dev's street code of cause
3.	Shruti Bharat	Women Techmakers International Women's Day India Summit 2021	20-21 th March 2021	National	IWD India 2021

OTHER TECHNICAL EVENTS :

In the year 2021-22, 2 students won at national level and 1 student won at state level and total 91 students participated in various technical events.

List of winners are :

SR. NO	NAME OF THE STUDENT	NAME OF EVENT IN WHICH PARTICIPATED	MONTH AND YEAR	WITHIN STATE/ NATIONAL LEVEL/ INTERNATIONAL LEVEL	ORGANISING INSTITUTE	PRIZE/ POSITION
1.	Manasi Mujumdar	In IIT Jammu Cultural & Technical Fest Script Writing Competition	24-25 th April 2021	National	IIT Jammu	3rd Position
2.	Manasi Mujumdar	Sci-Fi Story Writing Techtales event	2021	State	Ignite 3 & NMIMS	2nd Position
3.	Manasi Mujumdar	Winner of Pratibha- The Eaton Excellence Award 2021 from our college for analysis and presentation on Predictive health analysis of UPS battery systems.	6 th May 2021	National	Eaton	Winner

SUMMARY OF STUDENTS PARTICIPATED IN ONLINE COURSES :

SR. NO	ORGANIZED BY (ONLINE)	PARTICIPATION COUNT
1.	Coursera	14
2.	Udemy	04
3.	Hacker Rank	01
4.	Internshala	02
5.	Calarts	01
6.	Kaizen Futuretech	01
7.	NPTEL/ Swayam Govt. Of India	02
8.	Google Cloud	06
9.	MBTB	01
10.	Schneider Electric	01
11.	Solo Learn	01
12.	Progate	05
13.	Qubit	01
14.	Other Foreign Universities	33
15.	Other	15
	Total	**88**

ROBOCON :

List of Participants :

SR. NO	NAME OF THE STUDENT	NAME OF EVENT IN WHICH PARTICIPATED	MONTH AND YEAR	WITHIN STATE/ NATIONAL LEVEL/ INTERNATIONAL LEVEL	ORGANISING INSTITUTE
1.	Kajol Malgave	DD- Robocon 2020	24-25 th April 2021	National	IIT, New Delhi
2.	Vaishnavi Patil	DD- Robocon 2020	24-25 th April 2021	National	IIT, New Delhi
3.	Pranali Sontakke	DD- Robocon 2020	24-25 th April 2021	National	IIT, New Delhi
4.	Madhuvanti Oka	DD- Robocon 2020	24-25 th April 2021	National	IIT, New Delhi
5.	Aditi Tarate	DD- Robocon 2020	24-25 th April 2021	National	IIT, New Delhi

Puzzle Time! - Solution
Srishty Kumari, TY Entc

R	B	V	W	Z	L	S	I	D	I	W	A	T	M	S
E	F	G	C	A	P	A	C	I	T	O	R	B	U	D
S	O	Y	T	R	A	D	H	K	J	A	O	G	L	I
I	A	E	N	D	U	J	P	T	N	E	T	L	T	O
S	X	F	P	U	Z	M	A	S	U	X	C	W	I	D
T	I	B	O	I	Z	Q	F	J	H	G	U	A	M	E
O	C	U	N	N	D	O	V	U	K	Y	D	U	E	P
R	Q	Z	R	O	R	P	C	L	G	Z	N	X	T	A
D	R	Z	B	M	N	A	E	I	A	W	I	V	E	F
F	X	E	E	B	H	M	R	T	M	S	T	S	R	X
T	C	R	S	C	L	P	M	S	A	C	P	Y	N	K
E	V	S	T	J	A	E	P	H	H	G	F	A	X	B
N	J	I	O	P	Z	I	C	K	N	T	J	L	F	W
U	W	T	R	A	N	S	I	S	T	O	R	E	E	Y
S	E	M	I	C	O	N	D	U	C	T	O	R	S	I

Best Department Award

ENTC FACULTY

Faculty Performance

With warm regards,

Faculty co-ordinator: Dr. Seema Rajput

Student members:
Priyanka Balani
Lopa Chaudhari
Ananya Pendse
Gayatri Savarkar
Ishika Desai
Srishty Kumari
Aishwarya Pawar
Sakshi Dighade
Shruti Bharat
Aditi Singhal
Ishwari Kulkarni
Manasi Majumdar