CTC(T&IT),CRPF

e-Newsletter

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“Security used to be an inconvenience sometimes, but now it’s a necessity all the time."

How Is Modern Technology Affecting Human Development?

In the last few decades, technology has progressed at a staggering rate. Smartphones, the internet, cloud computing, and hundreds of other inventions are changing every facet of our lives. Communication, business, government, travel, fundraising, and even agriculture have been affected. But how about our brains? Is all this new technology changing us on the inside? Many think so, including psychology professionals. There are several areas where modern digital technology is certainly affecting the way we interact with the world and the way our children's brains develop. These areas include:

Attention

Evidence suggests that reliance on the internet and mobile technology is shortening our attention spans. When we all have computers in our pockets that allow us to play games, listen to music, and connect with friends whenever we want, why should we tolerate boredom? Of course, this shortened attention span likely comes with consequences. How many times do we miss important conversations or moments happening around us because we're mesmerized by our electronic devices?

Decision-Making

You need to buy a new car. What's the first thing you do? If you're like millions of others, you go online to do research. In fact, no matter what kind of a decision you need to make whether you're trying to figure out where to have dinner or the best way to start a new career you can turn to the internet for advice. This means that we, as a species, no longer have to rely so much on gut instinct but can instead gather facts and knowledge in an effort to make informed decisions.

Relationship Building

By 2020, 2.9 billion people are expected to be on social media. Couple that with person-to-person messages sent with both traditional SMS texting and messaging apps, and we are radically changing the way we can build and maintain relationships. But is this a good or bad thing? If we're at dinner with friends and are simultaneously texting a family member in California and Tweeting with acquaintances about an event in Japan, are we fully engaged in any of those relationships? Then again, doesn't being able to stay connected with friends and family around the world keep relationships alive that might otherwise wither? Nearly 70% of Americans think the internet is good for our relationships, but it remains to be seen if children who are growing up with smartphones develop the kinds of interpersonal and relationship-building skills they need to form deep and meaningful relationships, or if our species will become isolated from and uncomfortable with close, personal contact.

R&D Cell, CTC T&IT

Memory

The internet gives us access to a huge amount of information; plus, our personal computers can store every shopping list and stray thought we have, letting us access the information when we need it later. A new study finds that this “pervasive access to information has not only changed what we remember; it has changed how we remember. Our reliance on the internet has decreased our ability to easily retain facts. However, we appear to be improving our ability to remember where and how to locate information. For instance, we are now more likely to remember what folder we stored information in than we are to remember the information itself. Likewise, when faced with a question of fact, we are more likely to remember search terms that have helped us uncover answers to similar questions than we are to remember the fact itself

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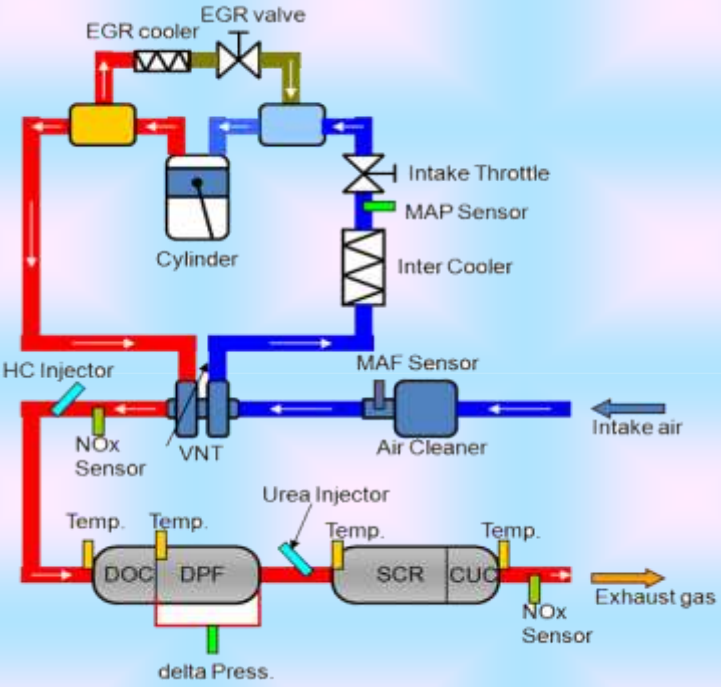
BSVI compression ignition Engines Technology

Vehicular pollution has become a major problem in urban areas due to the exponential rise in the number of automobiles. Typical exhaust emissions which include nitrogen oxides (NOx), hydrocarbons (HC), carbon monoxide (CO), soot, and particulate matter (PM) undoubtedly have an unpleasant effect on the environment. Several pollution control bodies are taking this subject seriously and issuing stringent emission norms which are to be complied strictly. Thus, regulation of these harmful pollutants is the need of the hour. Alternative fuels such as biodiesels and alcohols which are considered as a potentially viable solution for the problem of fossil fuel depletion also tend to require exhaust gas after-treatment in order to comply with the upcoming emission norms.



EGR in Intake system

Nearly 80 percent of the air we breathe is nitrogen. However, when it is exposed to the extremely high temperatures in the combustion chamber, plus 1370°C, the normally inert gas becomes reactive, creating harmful oxides of nitrogen or NOx, which are then passed through the exhaust system into the atmosphere.

To help minimize this, the EGR valve allows a precise quantity of exhaust gas to re-enter the intake the system, effectively changing the chemical makeup of the air entering the engine. With less oxygen, the now diluted mixture burns slower, lowering temperatures in the combustion chamber by almost 150°C, and reducing NOx production for a cleaner, more efficient exhaust.

What is an after-treatment system?

An after-treatment system is a method or device for reducing harmful exhaust emissions from internal-combustion engines. In other words, it is a device that cleans exhaust gases to ensure the engines meet emission regulations.

After treatment

The Particulate Filter contains the Diesel Particulate Filter (DPF) which collects and oxidizes carbon to remove particulate matter (PM) by more than 90%; the Diesel Oxidation Catalyst (DOC) aids in this process and are also contained in the Particulate Filter. The exhaust passes from the turbo through the DOC and enters the DPF.

After collecting the particles from the gases in the DOC and DPF, there is still nitric oxide (NO) and nitrogen dioxide (NO2) left in the exhaust. In order to reduce the NOx levels a light mist of urea (Diesel Exhaust Fluid (DEF) or Ad Blue) is injected into the hot exhaust stream in the Decomposition Reactor.

The exhaust progresses from the Decomposition Reactor into the SCR system which converts the toxic NOx and urea mixture into harmless nitrogen gas (N2) and water vapor (H2O), which effectively eliminates harmful emissions resulting in near zero emissions from the exhaust.

Conclusion

While after treatment systems are often overlooked and neglected in terms of maintenance, these systems are important to the performance of diesel trucks. Because an unclean DPF filter can clog and damage other emission components, ignoring recommended cleaning or replacement intervals can cause engine performance issues, reduced efficiency, damage to emission control components and ultimately, unplanned downtime and costly repairs. Consequently, it is important for fleets and service personnel to understand the key benefits of maintaining their aftermarket treatment systems, and how those systems contribute to the trucks' overall performance.

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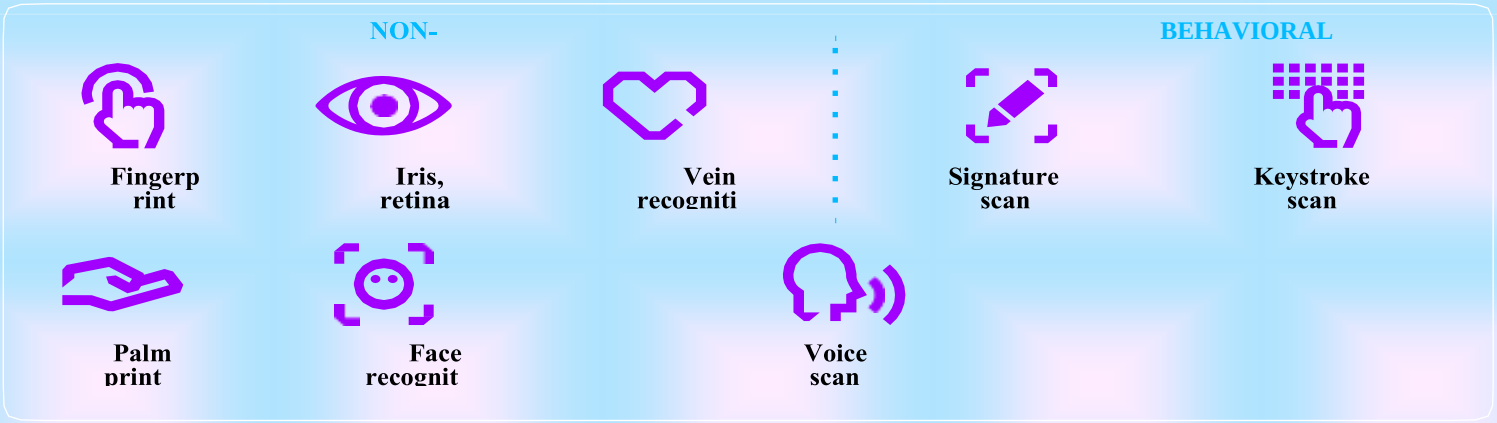
BIOMETRICS REWORKS AUTHENTICATION

Biometrics is the process of measuring physiological or behavior a characteristics of an individual as a mean of identification or authentication. Identification aims at establishing someone' identity, answering the question "who this person is?", whereas authentication (also called verification) is about confirming someone's identity, answering the question "is this person the one he claims to be?".

Physiological characteristics are in he rent features of the human body while behavior a

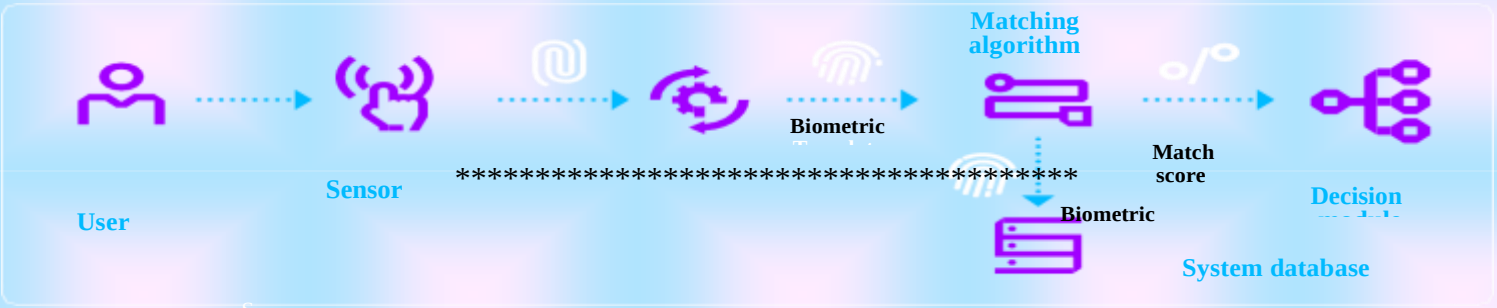


characteristics refer to personal demean or. Fingerprint- recognitions one of the most widely known biometric mean of authentication, especially since Apple introduced it in its smart phones in 201330. Nonetheless, an increasing number of other methods are used for biometric authentication: physiological biometrics such as face recognition, eye recognition (iris or retina), palm print recognition or veins recognition, and behavioral biometrics such as signature or keystroke scans. Some biometrics can even combine physiological and behavioral metrics analyses, for example voice- recognition which analyses inherent characteristics of the voice and the speaker's phrasing.

Biometric authentication systems require first an phase, during which the system records the biometric traits of the user to create a template. This phase is critical to authentication process reliability. The system must ensure that the person performing the enrolment is really the client. A strong authentication or an identity check in person in branch is therefore necessary. Once users are enrolled, the system uses the following steps to authenticate them:

- First, a sensor captures the biometric trait of the individual. The technology used may vary from one biometric method to another and even within the same method.
- The biometric sample is converted into a template, then compared by a matching algorithm to the template(s)in the data base. The matching algorithm issues a matching's core, in the words the probability that both samples belong to the same person.
- Base don't his score, a decision module identifies the individual and/or approves the authentication.

FIGURE 2: MATCHING PROCESS



Li-Fi (Light Fidelity): The Future Technology in Wireless Communication

It is often frustrating when the slow speed of network leads to limited connectivity and long processing hours while using wireless internet either at home network or coffee shop or airport or competing for bandwidth at a conference. As more and more users are tapped in with their devices, the clogged airwaves make it difficult to latch on a reliable signal. What if we can use waves other than Radio waves to surf the internet? Radio wave seems to be fully exploited and other spectrum needed to be explored. In this direction, Dr Harold Haas, a German physicist proposed an idea called "Data through Illumination" in which he used fiber optics to send data through LED light bulb. The idea is similar as of infrared remote controls but far more powerful.

How it works

It is implemented by using a light bulb at the downlink transmitter. Normally the light bulb glows at a constant current supply however fast and subtle variations in current can be made to produce the optical outputs since it just uses the light, hence can be easily applied in aircrafts or hospitals or any such area where radio frequency communication is often problematic. The operation procedure is very simple-, if the LED is on you transmit a digital 1, if it is off you transmit a 0. The LED can be switched on and off very quickly hence 1690 Dinesh Khandal, Sakshi Jain providing nice opportunities to transmit data. Hence all that is required id some LED and a controller that code data into those LEDs flicker depending upon the data we want to encode. The more LEDs in your lamp, the more data it can process. To further get an clear idea of what is said above let us consider a IR

remote which sends data stream at rate of 10000-20000 bps. Now replace the IR LED with a light box containing a large LED array which is capable of sending thousands of such streams at very fast rate. LEDs are found in traffic and street lights, car brake lights, remote control units and countless other applications. So visible light communication not only solves the problem related to lack of spectrum space but also enable novel application because this spectrum is unused and not regulated thus can be used for communication at very high speeds. This method of using rapid pulses of light to transmit information wirelessly, technically referred to as visible light communication (VLC) has a potential to compete with Wi-Fi and hence inspired the characterization of Li-Fi.

Transfer medium (fiber optic)

Generally, fiber optic cables are wires that transmits data through a extremely thin layer of glass or plastic fiber threads. The relation between fiber optic thread and LiFi is that light signals travel through these fibers in form of light and then translated to 1's and 0's, the data part. However fiber optics are extremely expensive but massive bandwidth availability can do away with that and hence may soon replace most existing wired cables and the change has already started initiating.

ADVANTAGES OF LI-FI OVER WI-FI

High speed connectivity of the rate of 500mbps.

- Li- Fi uses light rather than radio frequency signals so are intolerant to disturbances.
- VLC could be used safely in aircraft without affecting airlines signals.
- Integrated into medical devices and in hospitals as this technology doesn't deal with radio waves, so it can easily be used in all such places where Bluetooth, infrared, Wi-Fi and internet are broadly in use.
- Under water in sea Wi-Fi does not work at all but light can be used and hence undersea explorations are good to go now with much ease.
- There are billions of bulbs worldwide which just need to be replaced with LED's to transmit data.
- Security is a side benefit of using light for data transfer as it does not penetrate through walls.
- On highways for traffic control applications like where Cars can have LED based headlights, LED based backlights, and they can communicate with each other and prevent accidents.
- Using this Technology worldwide every street lamp would be a free data access point.
- The issues of the shortage of radio frequency bandwidth may be sorted out by Li-Fi.

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Technical Quiz

1. Cyber-crime can be categorized into _____ types.

   a) 4

   b) 3

   c) 2

   d) 6

2. Which of the following is not a type of peer-to-peer cyber-crime?

   a) Phishing

   b) Injecting Trojans to a target victim

   c) MiTM

   d) Credit card details leak in deep web

3. Which of the following is not done by cyber criminals?

   a) Unauthorized account access

   b) Mass attack using Trojans as botnets

   c) Email spoofing and spamming

   d) Report vulnerability in any system

4. Under which section of IT Act, stealing any digital asset or information is written a cyber-crime.

   a) 65

   b) 65-D

   c) 67

   d) 70

5. Plain text are also called _____

   a) cipher-text

   b) raw text

   c) clear-text

   d) encrypted text

6. _____ cryptography operates on binary-bit series and strings.

a) Modern

b) Classic

c) Traditional

d) Primitive.

7. _____ carries out all its calculations on bytes rather than using bits and is at least 6-times faster than 3-DES.

a) AES

b) DES

c) IDEA

d) Twofish

8. AES stands for _____

a) Advanced Encryption Security

b) Advanced Encryption Standard

c) Advanced Encrypted Standard

d) Active Encryption Standard

9. Data Encryption Standard is an example of a _____ cryptosystem.

a) conventional

b) public key

c) hash key

d) asymmetric-key

10. _____ cryptography deals with traditional characters, i.e., letters & digits directly.

a) Modern

b) Classic

c) Asymmetric

d) Latest

CERT	Computer Emergency Response Team	In this case, an expert group that handles computer security incidents and alerts organizations about them.
CHAP	Challenge-Handshake Authentication Protocol	A protocol for authentication that provides protection against replay attacks through the use of a changing identifier and a variable challenge-value.
CIRT	Computer Incident Response Team	A group that handles events involving computer security and data breaches.
CIS	Center for Internet Security	A 501 nonprofit organization with a mission to "Identify, develop, validate, promote, and sustain best practice solutions for cyber defense and build and lead communities to enable an environment of trust in cyberspace."
CISA	Certified Information Systems Auditor	Professionals who monitor, audit, control, and assess information systems.
CISO	Chief Information Security Officer	The CISO is the executive responsible for an organization's information and data security. Increasingly, this person aligns security goals with business enablement or digital transformation. CISOs are also increasingly in a "coaching role" helping the business manage cyber risk. This is according to Ponemon Institute research.
CISSP	Certified Information Systems Security Professional	The CISSP is a security certification for security analysts, offered by ISC(2). It was designed to indicate a person has learned certain standardized knowledge in cybersecurity.
CNAP	Cybersecurity National Action Plan	A U.S. plan to enhance cybersecurity awareness and protections, protect privacy, maintain public safety, and economic and national security.
COBIT	Control Objectives for Information and Related Technologies	An IT management including practices, tools and models for risk management and compliance.
CSA	Cloud Security Alliance	The Cloud Security Alliance is the world's leading organization for defining best practices in cloud cybersecurity. It also provides a cloud security provider certification program, among other things.

Acknowledgement

We are highly thankful for reading out this compilation and hope it will be useful for you in our day to day professional and personal life. We would like to hear your interest areas, suggestions from you to make this newsletter more informative and interesting. Your views will definitely help us to create this newsletter as an effective medium to reach you with latest development in the fields of communication and technology.

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Answers to the Quiz

1	2	3	4	5	6	7	8	9	10
C	D	D	A	C	A	A	B	A	B