

Department of  
**COMPUTER SCIENCE & ENGINEERING**

# TECH-EXPLORER

Technical Magazine

**2021-22 HALF YEARLY TECHNICAL MAGAZINE**  
**VOLUME NO: X [JAN 2022-JUNE 2022]**

## EDITORIAL BOARD

### FACULTY

**Dr. K.M. Varaprasad**

Professor

### STUDENTS

Ch. Viswanath Hemanth, IV CSE

P. Niladri Sai Prasad Reddy, III CSE

S. Tejaswini, III CSE

C. Sathish, II CSE



## CONTENTS

WEB 3.0

INTELLIGENCE OF THINGS

VIRTUAL REALITY

SURFACE COMPUTER

BLACK HAT HACKING



**NARAYANA**  
**ENGINEERING COLLEGE**  
NELLORE (AUTONOMOUS)



## Vision of the institute

To be one of the nation's premier Institutions for Technical and Management Education and a key contributor for Technological and Socio-economic Development of the Nation.

## Mission of the institute

To produce technically competent Engineers and Managers by maintaining high academic standards, world class infrastructure and core instructions.

To enhance innovative skills and multi disciplinary approach of students through well experienced faculty and industry interactions.

To inculcate global perspective and attitude of students to face real world challenges by developing leadership qualities, lifelong learning abilities and ethical values.

## Vision of the Department

To be a choice for education in the area of Computer Science and Engineering, serve as a valuable resource for IT industry & society and exhibit creativity, innovation and ethics to cater the global challenges.

## Mission of the Department

M1: To educate learners by adapting innovative pedagogies for enhancing their cognitive skills, technical competence and lifelong learning.

M2: To provide training programs and guidance to learners through industry institute partnerships, social awareness programs, internships, competitions and project works to inculcate research skills to address the global challenges.

M3: To provide opportunities for students to practice professional, social and ethical responsibilities using IT expertise with a blend of leadership and entrepreneurial skills.

## PEOS

**PEO-1** : Procure employment/progress towards higher degree and practice successfully in the CS/IT profession. (Successful Career Goals).

**PEO-2** : Address complex problems by adapting to rapidly changing IT technologies. (Professional Competency).

**PEO-3** : Gain respect and trust of others as effective and ethical team member by demonstrating professionalism and functioning effectively in team-oriented and open-ended activities in industry and society. (Leadership, Ethics and Contribution to Society).



## (PROGRAM SPECIFIC OUTCOMES) PSOs

**Domain Specific Knowledge:** Apply the relevant techniques to develop solutions in the domains of algorithms, system software, computer programming, multimedia, web, data and networking.

**Software Product Development:** Apply the design and deployment principles to deliver a quality software product for the success of business of varying complexity.

## (PROGRAM OUTCOMES) POs

**1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multi disciplinary settings.

**10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**12. LIFE-LONG LEARNING:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## WEB 3.0

Imagine a new type of internet that not only accurately interprets what you input, but actually understands everything you convey, whether through text, voice or other media, one where all content you consume is more tailored to you than ever before. We are at the tipping point of a new phase in the web's evolution. Some early pioneers call it Web 3.0



### What Is Web 3.0?

Web 3.0 is the upcoming third generation of the internet where websites and apps will be able to process information in a smart human-like way through technologies like machine learning (ML), Big Data, decentralized ledger technology (DLT), etc. Web 3.0 was originally called the Semantic Web by World Wide Web inventor Tim Berners-Lee, and was aimed at being a more autonomous, intelligent, and open internet.

The Web 3.0 definition can be expanded as follows: data will be interconnected in a decentralized way, which would be a huge leap forward to our current generation of the internet (Web 2.0), where data is mostly stored in centralized repositories.

Furthermore, users and machines will be able to interact with data. But for this to happen, programs need to understand information both conceptually and contextually. With this in mind, the two cornerstones of Web 3.0 are semantic web and artificial intelligence (AI).

### Web 3.0 Technologies

There are a few details that we need to keep in mind when looking into Web 3.0 tech. First of all, the concept isn't new. Jeffrey Zeldman, one of the early developers of Web 1.0 and 2.0 applications, had written a blog post putting his support behind Web 3.0 back in 2006. But talks around this topic had begun as early as 2001.

Evolution of the Web 3.0 Technologies

Web 3.0 will be born out of a natural evolution of older-generation web tools combined with cutting-edge technologies like AI and blockchain, as well the interconnection between users and increasing internet usage. Apparently, Internet 3.0 is an upgrade to its precursors: web 1.0 and 2.0.



### Key Features of Web 3.0

To really understand the next stage of the internet, we need to take a look at the key features of Web 3.0

**Ubiquity:** Ubiquity means being or having the capacity to be everywhere, especially at the same time. In other words, omnipresent Web 3.0 simply takes this a step further by making the internet accessible to everyone anywhere, at any time. At some point, internet-connected devices will no longer be concentrated on computers and smartphones like in Web 2.0 since IoT (Internet of Things) technology will bring forth a plethora of new types of smart devices.

**Artificial Intelligence:** Wikipedia defines AI as intelligence demonstrated by machines.

And since Web 3.0 machines can read and decipher the meaning and emotions conveyed by a set of data, it brings forth intelligent machines. Google's AI system recently removed around 100,000 negative reviews of the Robinhood app from the Play Store following the Gamespot trading debacle when it detected attempts of rating manipulation intended to artificially downvote the app. This is AI in action, which will soon seamlessly fit into Internet 3.0, enabling blogs and other online platforms to sift data and tailor them to each user's liking. As AI advances, it will ultimately be able to provide users with the best filtered and unbiased data possible.



### Spatial Web and 3D Graphics

Some futurists also call Web 3.0 the Spatial Web as it aims to blur the line between the physical and the digital by revolutionizing graphics technology, bringing into clear focus three-dimensional (3D) virtual worlds.

## INTELLIGENCE OF THINGS

The **Intelligence of Things** refers to the integration of the Internet **Artificial Intelligence technologies with IoT devices**, also known as the Artificial Intelligence of Things (**AIoT**). Over the past decades, the Internet of things has emerged as one of the most pervasive technologies with the explosive growth of devices and systems connected by the internet, allowing them to communicate and share information with each other globally. Embedded with multiples technologies, IoT



devices have created numerous opportunities and extensive set of services for consumer, industrial, commercial and infrastructure applications. Artificial Intelligence describes the intelligence of machines by simulating the cognition of humans. Endowed with human-like intelligence, machines can perform intellectual tasks such as planning, learning, problem solving, self-awareness and perception.

Nowadays, with the progressive advances in computer science, mathematics, psychology and many other fields, AI techniques have attracted widespread global attention. Merging AI with the internet of things will create a powerful technology that transforms the connected devices to be more proactive, smart and communicative. AI can create models and hypotheses, reveal relationships, formulate solutions and provide predictions. With the strong analytic capability of AI, the huge amount of data generated by IoT devices can be extracted with meaningful information, processed and analyzed more efficiently to make accurate and autonomous decisions. This results in a new path of research and development for connected devices to work together as a smart system and improve human-machine interactions. The Intelligence of Things team at HRI-US focuses on immersed intelligence and nanomaterials that extend to a wide range of applications by delivering unique value that contributes the environment and society.

**K. RESHMA**

19711A0536, III CSE

## VIRTUAL REALITY

NFTs serve a key concept in the metaverse ecosystem, allowing people to own virtual goods in the form of real-estate, items like cars, boats or even accessories and paintings—all possible through NFTs.

NFTs are generally associated with websites and transactions that occur through web browsers, and because the metaverse is mostly VR-based, there might be some confusion about what their common ground is — and whether there is any in the first place. The metaverse uses NFTs for in-game avatars, lands, items, pets, and game quests. Despite the relative novelty of both concepts, several companies have already found creative and fruitful ways to use both simultaneously.

Few real time applications of this concept is:

- Virtual marketplace. With apps like VRChat, spaces for communication in VR are [already thriving, and it is not a huge leap to assume that these spaces can also serve as a fertile trading ground for NFTs.](#)
- Art gallery. VR is perhaps the best possible platform (short of an actual brick-and-mortar building) for viewing art. You get to see it up close with every detail and from every angle.
- New frontiers. Real estate can be a pretty lucrative industry to work in in the physical world, and the same could apply to the metaverse.



**N. TEJASWAROOPA**

18711A0568, IV CSE

## SURFACE COMPUTER

Nowadays instead of using keyboard and mouse, the user interacts with a surface. Typically the surface is a touch-sensitive screen. It has been said that this more closely replicates the familiar hands-on experience of everyday object manipulation. Surface Computing is the use of a specialized computer GUI in which traditional GUI elements are replaced by intuitive, everyday objects. Early work in this area was done at the University of Toronto, Alias Research and MIT. This research includes the basic features, history, applications, advantages, disadvantages, working and structure of surface computing. The goal of surface computing is to recognize touch and objects on the screen's surface and to interact with those objects seamlessly.



### There are 4 attributes: -

1. Direct interaction: means that, we can interact with the Surface by using our fingers.
2. Multi-touch: Surface computing recognizes many points of contact simultaneously; surface has been optimized to respond 52 touches at a time.
3. Multi-user: The horizontal form factor makes it easy for several people to gather around surface computers together, providing a collaborative, face to face computing experience.
4. Object recognition: Users can place physical objects on the surface to trigger different types of digital responses, including the transfer of digital content.

Surface computer was announced on May 29, 2007 at D5 conference. Preliminary launch was on April 17, 2008. The latest version is Microsoft Surface 2.0.

### It consists of 4 parts:-

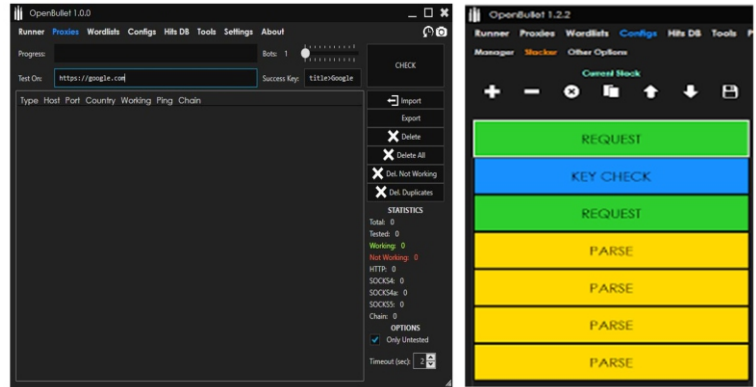
1. Screen: A diffuser turns the Surface's acrylic table top into a large horizontal multi-touch screen, capable of processing multiple inputs from multiple users.
2. Infrared: Surface's 'machine vision' operates in the near infrared spectrum, using an 850-nanometer-wavelength LED light source aimed at the screen.
3. CPU: Surface uses many of the same components found in everyday desktop computers.

The applications of surface computing are: Digital photo handling with finger tips, instantly compares while shopping, interaction with digital content by share, drag and drop, digital images, Surface Restaurant, quickly browse through play list entries dragging favourite song to the current track, easy to take complex shopping decisions. It is not simply a touch screen, but more of a touch-grab-move slide resize-and-place objects-on-top-of-screen, and this open up new possibilities that weren't before

**Earlier it was - A COMPUTER ON EVERY DESKTOP' Now we say, 'EVERY DESKTOP WILL BE A COMPUTER.**

## What is Open Bullet ? (Black Hat Hacking)

OpenBullet is a testing suite of software allowing users to perform requests on a target web application. The open source tool and is used by businesses for various legitimate purposes including scraping and parsing data and automated penetration testing. OpenBullet allows a user to import prebuilt configuration files, or configs, for each website to be tested. These OpenBullet configs can be modified as needed, a mandatory feature since



websites tend to make slight adjustments to user experience to counter credential stuffing attempts.

The tool has its own dedicated forum offering the latest version of OpenBullet but cautioning against using it for credential cracking.

Credential stuffing, a type of a brute-force attack that makes use of botnets to access websites and online services using stolen credentials, allows financially motivated actors to gain unfettered access to victims' bank accounts and sensitive information. Cybercriminals also profit from stolen credentials by selling them in underground forums and markets.

As the business of acquiring unique credentials continues to become more lucrative, cybercriminals are enriching their attack tools and techniques by abusing legitimate software for nefarious purposes.

I explain detail how cybercriminals exploit OpenBullet, a legitimate web-testing software, to brute-force their way into targeted accounts. Due to OpenBullet's popularity, a whole market for trading configuration scripts have formed in the underground. We explore how some threat actors compromise the supply chain of OpenBullet configuration scripts by supplying scripts with hidden features. Finally, we also give recommendations on how users and organisations can handle multiple passwords efficiently and securely, and provide guidance on how they can remain protected from credential stuffing attacks that lead to account takeovers.

It is undeniable that data breaches are becoming more commonplace and alarming. In February 2021, the Compilation of Many Breaches (COMB) was made available online, exposing a staggering 3.2 billion credentials. In line with such developments, credential stuffing attacks are expected to continue rising in number.

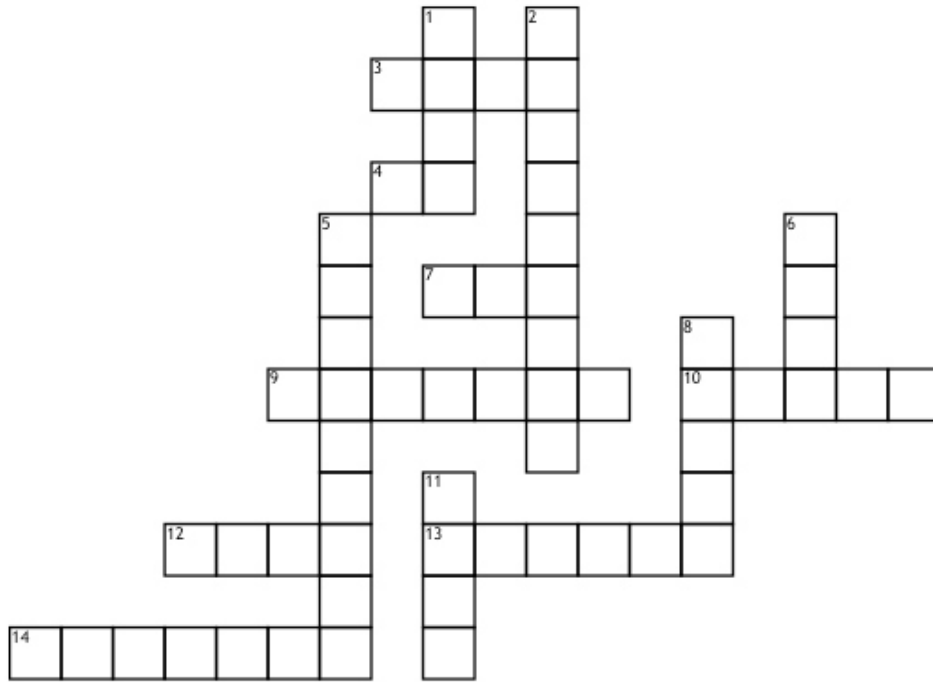
Despite an accelerating number of online services allowing users to boost their account security by means of enabling either two-factor authentication (2FA) or MFA, the adoption of these security tools remains low. Research has shown that people tend to ignore 2FA or MFA, thinking that their passwords are already strong enough and that these practices are unnecessary. For instance, a 2018 report divulged that 90% of active Gmail users have not enabled 2FA.

The same goes for password managers — although these are effective in securing a large number of unique passwords, many users still do not use them, let alone trust them. According to a survey conducted by Password Manager and YouGov, 65% of Americans distrust password managers.

Given the nefarious uses by cybercriminals with regard to stolen credentials, it is vital to have more promotional campaigns that highlight the importance of creating strong, unique, and secure passwords and storing them in password managers. Indeed, users and organisations can only benefit greatly from the widespread adoption of credential security recommendations.

**N. SUSHAMA**

19711A0568, III CSE

**Across**

3. Computer language  
 4. Pixar movie Doug the dog  
 7. Problem in an algorithm or program  
 9. An instruction for the computer  
 10. A way to give information to a computer

12. Not right but  
 13. A way to get information out of a computer  
 14. An algorithm that has been coded into something that can be run by a machine

2. Finding and fixing problems in an algorithm or program

5. A list of steps to finish a task

6. Instruction to quit

8. Correct

11. Not up but

**Down**

1. The action of doing something over and over again

**Word Bank**

stop	down	debugging	input	right
Up	algorithm	program	left	command
code	loop	output	bug	

Department of COMPUTER SCIENCE AND ENGINEERING



**NARAYANA**  
**ENGINEERING COLLEGE**  
**NELLORE (AUTONOMOUS)**

