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Trends in Computer Science

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Coursework II: Portfolio

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1. Employability and career planning

Career planning refers to the process of deciding on a career path, developing professional objectives, and deciding on behavioral and academic programs to help you achieve your goals. It's an important part of an individual's self. Information technology is presently at the forefront of the world's emerging fields. When investigating a suitable field to learn for a degree, I discovered that the IT industry will be of high value in the future, as well as having an increasing market value. Software engineering is a designing subject that spotlights on growing great programming frameworks for a minimal price. And my vision doesn't end there; I have new thoughts for building current applications that will help individuals in their everyday errands. Programming is ethereal and theoretical. It isn't restricted by materials, nor is it limited by actual regulations or creation methods. Notwithstanding, on the grounds that there are no normal limits, programming may quickly become grow exceedingly and be hard to fathom. (McLean and Michelle, 2006)

I choose IIT as the most acceptable university to my higher studies to match my talents, I picked programming to match my abilities and because I wish to study about mobile app development. An application designer produces applications for use on computerized gadgets. An application developer is expected in for all intents and purposes each industry, so work open doors are numerous and testing. A computer programmers can either work for an organization or do my own business. (McLean and Michelle, 2006)

I gained valuable experience on where we want to focus in the upcoming from the courses, we had to take in the first year. Prior to attending IIT, I studied a variety of markup languages and programming languages at schools, including HTML and Python. We concentrated entirely on Python, Java, and HTML python, programming language dialects in the first year. I discovered that focusing on programming languages to become an IT expert is quite important. Working in the industry needs a high level of industry knowledge. We must be open to new things, experiences, and experiments. In the first year, we learned how to build websites and user interfaces, which will come in helpful when choosing L5 and L6 programs. I want to develop my own app. At level 6, I'll be doing sophisticated side web development. With the increase in threats inside the sector, software engineers will have a huge impact on cyber security. (Becker and Felicity, 2014)

As I previously stated, I intend to undertake Mobile Application Development for my level 5 since I want to design current apps. This subject is significant since it teaches me how to utilize mobile application programming techniques and production environments to create and launch a mobile application, as well as how to ensure portability across a variety of devices. These things are immediately applicable to my hobby of designing web apps. (Becker and Felicity, 2014)

I'm hoping to do Applicable Robotic for my level 6. I will learn how to build robotic and many more tasks. Robotics is a rapidly expanding technology in the current world, as seen in the graph below. (McLean and Michelle, 2006)

As of late, I went to a guest lecture at IIT where he made sense of about mechanical technology where he gave a few uses of mechanical technology, for example, in modern

robotization, home mechanization, drones, development, farming, clinical, risky activities and in the military and fighting area. This studio provided me with an unmistakable thought of mechanical technology and what area I ought to pick and its upsides. Aside from the things educated at IIT, I have moved forward in learning through sites, for example, LinkedIn learning, I have done a few courses connected with site advancement and a few courses connected with UI of portable applications, Furthermore, I am intending to do courses where I can find out about mechanical technology before I get to Level 6. Sites, for example, LinkedIn learning assists me with getting some extra data which I can apply while I'm chasing after a task. Additionally, I might want to take part in my lords in abroad which I think would be a benefit in expanding my employability. Likewise, I think the CV additionally influences the employability. A CV offers you the chance to feature your most prominent qualities to a task candidate. It features your abilities and experience while additionally demonstrating that you are the ideal candidate for the gig likewise numerous associations give understudy position programs. These may be parttime or full-time and can endure somewhere in the range of a half year to a year. A few entries level positions or arrangement programs are more controlled and formal than others which additionally builds the employability. Establishing a decent first connection is imperative in the present cutthroat work. (Subramanian, and Dutt, 2016)

1.1. Reference

- McLean and Michelle. (2006). Managing your own career: employability plus: Mid-Career Success Guide: Planning for the Second Half of Your Working Life, by Sally J. Power. Westport, CT: Praeger Publishers, 2006. 200 pp. US\$68.50 hard cover ISBN 13: 9780275988012. Available from <https://bit.ly/3MImSWd> [Accessed 11 April 2022].
- Becker and Felicity. (2014). Boost your employability. SAGE Publications Ltd. Available from <https://bit.ly/3MgFV3Y> [Accessed 13 April 2022].
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2. Artificial Intelligence and Ethics

2.1. Introduction

As the modern lifestyle evolves, emerging technologies are already being leveraged to improve life and better. Artificial intelligence (AI) is a higher level of technology that has been developed that can compete with human intelligence. This has the ability to improve the quality of life for people while also having social and ethical implications. This study will look at what artificial intelligence is and debate the ethics of AI and its effects on society. (Dubber and Markus, 2020)

2.2. What is Artificial Intelligence

Man-made awareness is a processing notion that allows a machine to think and solve complicated problems in the same way that we do using our insight. This is a hypothesis that suggests computers can learn how to think. It includes challenges like as machines learning on their own, adapting to a particular situation, and self-revising defects. Machines, in other words, can think for themselves rather than being influenced by commands. An invention can perform a variety of human-like duties. AI makes the use external knowledge, such as massive amounts of data, to get excellent results for the tasks at hand. AI was first a concept found in science fiction and debates about the impact of innovation in today's environment. All of this, and much more, is possible with artificial awareness. (Abbas and Ali, 2020)

2.3. Artificial Intelligence's Evolution and History

AI was first defined in 1950, but early versions included serious problems that prevented broad acceptance and use. With the development of deep learning in the early 2000s, many of these limits were alleviated.

In recent years, artificial intelligence (AI) has evolved into a powerful tool, allowing machines to think and act like humans. Furthermore, it has sparked interest in sectors all across the world. Given the development of mobile & cloud technology, it is regarded as the next significant technological revolution. Some refer to it as the "fourth industrial revolution."

AI applications have improved dramatically in recent years, with applications in nearly every industry. (Dubber and Markus, 2020)

2.4. Impacts on society

2.4.1. Positive Impacts

Human fatigue-related errors are reduced by AI. Human error is unavoidable and costly in the workplace. AI systems are impervious to fatigue and emotional distraction. It lowers errors and enables more efficient work completion. The influence of AI on the health business is improving patient care while also helping health providers to operate more efficiently and cost-effectively. AI has become increasingly important in the creation of computers that diagnose, analyze, and anticipate the progression of various illnesses, and also inpatient patient health monitoring. Artificial based on virtual help and intelligent automation on routine operations make it easier and faster for people to complete their daily tasks and enhance their performance in a number of ways This enables people to dedicate more attention and time to creative and social pursuits. (Dubber and Markus, 2020)

2.4.2. Negative Impact

- The whole cost of production is extremely high.
- Disconnects a team's social bonds.
- They may result in unemployment.
- They occupy people's time.
- A minor flaw can result in an unforgivable loss.
- Creativity and outside-the-box thinking would be banned.

2.4.3. Challenges

One important challenge would be that robots will progress to the stage where humans is unable to keep up. This highlights the loss of employment as a result of automation. Another difficulty is that, while the AI's intended aim and goal were to help humanity, it would have an effect on the community if it chose to pursue the intended outcome in a harmful manner. (Abbas and Ali, 2020)

Data is the driving force behind AI systems. As even more data is gathered, our privacy is compromised. As a result, there is a worry that machines will be used to breach people's privacy and as a weapon.

2.5. Ethics of Artificial Intelligence

Artificial intelligence ethics are a set of concepts, ideas, and approaches that control moral conduct in the development and implementation of AI systems by using universally accepted right and wrong criteria. The most crucial thing to protect is one's privacy. Data protection are serious ethical concern. Accessing massive datasets poses security problems since I require them. This has the potential to lead to the abuse of personal information. The influence of AI on human actions and interactions is frequently debatable. Human capacity to create touch is diminished as a result of continual contact with machines. With the rise of automated work, unemployment has now become a big ethical issue. (Dubber and Markus, 2020)

- Data security and privacy are fundamental ethical concerns. Because AI need vast data sets, gaining access to them presents security risks. This might result in the abuse of personal information.
- Bias is a highly debated ethical issue due to a lack of transparency. One key challenge is that Ai technologies may mistakenly or intentionally duplicate existing prejudices. This raises questions about accuracy and predictive suggestions.
- How AI influences human behavior and relationships is an often-posed ethical quandary. Humans are constrained in their ability to form connections as a result of their constant encounters with machines.
- With the development of automated work, unemployment has become a major ethical problem.

2.6. Conclusion

An artificial expert system is a computer concept that enables machines to understand and solve complicated problems in the same way that people do. This is a technology capable of performing a wide variety of human-like jobs. When computers can understand their personal emotions and even the feelings of others, they will have awareness and intelligence equivalent to humans. To attain high performance for the defined objectives, AI takes use of external data, including such big data. The most complex sort of artificial intelligence is self-aware AI.

2.7. References

- Dubber and Markus D. (2020). The Oxford handbook of ethics of AI. New York : Oxford University Press. Available from <https://bit.ly/3vyLB2v> [Accessed 15 April 2020].
- Abbas and Ali E. (2020). Next-generation ethics : engineering a better society. Cambridge: Cambridge univ press UK. Available from <https://bit.ly/3rEAVy7> [Accessed 16 April 2020].

3. Internet of Things

3.1. Introduction

In today's digital world, devices, machines, other objects of all sizes may transfer data automatically and also in real-time over a network. The emergence of the Internet of Things has had a huge impact on this breakthrough. The use of IoT has experienced tremendous growth, bringing with it several advantages as well as certain computer security concerns. This study will explain exactly IoT is, how it differs from the old World Wide Web, the security challenges, and how to deal with them. (Stahl and Bernd, 2021).

3.2. What is Internet of Things?

The Internet of Things (IoT) refers to physical items that are outfitted with processing power, sensors, software, and other technologies that allow devices and systems to connect and exchange data and information over the Internet or other communication networks. There is no need for human-to-human or human-to-computer connection. The sophistication of these devices ranges from basic household goods to sophisticated industrial equipment. (Stahl and Bernd, 2021).

3.3. How does this differ from traditional internet?

The Internet of Things (IoT) can be thought of it as an Internet-based extension and expansion network, although it is not the same as a traditional network. Simply said, IoT is made up of a combination of regular internet and wireless local area networks (WSN).

The first distinction is that the intricacies of the TCP/IP protocol are not acceptable, especially when working with intelligent little things, hence IoT may not utilize IP in all cases for object addressing. Because the nature of IoT necessitates lighter communication protocols whereas conventional necessitates bulkier protocols, the TCP/IP protocol may not even be suitable in all circumstances. (Stahl and Bernd, 2021).

The second distinction would be that, unlike traditional networks, companies rely heavily on linked smart devices. That is what motivates them to become much more than merely an integral part of The internet; the behavior of the IoT is also reliant on the advancement of process standardization. (Mao and Yishu, 2021).

The third distinction is that IoT provides traits such as interoperability, self-configuration, self-adaptiveness, and self-protection. The smart environment, as opposed to the traditional internet, is a technique of guaranteeing that the network meets a minimal level of the previously described features. (Mao and Yishu, 2021).

3.4. The challenges IOT creates for cyber security

Weak Passwords

- As humans, we are less accustomed with passwords. Many of us reuse passwords or use weak passwords that are simple to remember. Weak passwords in just about any setting invite an attack, which is particularly true for Internet - of - things devices.

Frequent Updates

- Most software and devices are regularly updated to protect against security issues. Nevertheless, user awareness is poor since they would not want to review those updates again because it is exhausting. Simple issues such as weak passwords, a lack of information, literacy, or poor management skills can all contribute to cyber security issues.

Insufficient updates and testing

- When it comes to dealing with device-related security concerns, technology corporations are frequently overconfident. The majority of these devices and IoT items do not require frequent upgrades. This implies that a device that was previously thought to be secure when purchased becomes vulnerable subsequently. As a consequence, clients are at risk of security breaches.

System-related data leaks

- Hackers can get sensitive information by using insecure communications. All data is transported to it and stored in the cloud, and cloud-hosted applications are equally vulnerable to external assaults. Third-party services in the network are another cause of data leakage.

3.5. How to Overcome Cyber Security Challenges

As a result from several worries about the risks involved with the proliferation of IoT technology and products, specifically in the realm of privacy and security, companies and government attempts to address these concerns had also begun, including the development of international quality standards, regulatory frameworks, and guidelines. (Stahl and Bernd, 2021).

Businesses and corporations are really thinking about beefing up their security procedures. It is standard practice to educate users on how to take security procedures that include both technology and training-based techniques. These are only a few of the steps that may be performed to resolve these issues. (Mao and Yishu, 2021)

1. Change your router's default settings.

The great majority of people fail to rename this switch and instead use the name assigned by the manufacturer. Change the settings security and prevention settings if possible.

2. Disconnect IoT devices when not in use.

You should be aware of every feature that you expect from your IoT device. Many modern devices, including refrigerators and televisions, may connect to the internet. So, unplug from the gadgets if you wouldn't need to utilize them.

3. Select a secure password, but don't use it too often.

Using a simple and well-known passcode for IoT devices invites hackers to access. A hacker who knows one of their passwords may be capable of harming any machine you own. Use a distinct password for each machine. It may be tough to remember all of the passwords, but it is vital to protect IoT devices.

4. All software and firmware should be kept up to date.

Most IoT manufacturers release regular updates, and you may also visit their website for upgrade kits. Firmware protects you by including the most current security updates. Updating IoT device software ensures that the machine has by far the most up-to-date malware protection and antivirus security.

3.6. Conclusion

This study includes issues such as a definition of the internet of things, how something differs from the traditional internet, the problems it causes for cyber security, and how to solve these challenges. The possibilities of the Internet of Things may help consumers and organizations save time & expense while also enhancing choice and results in a range of industries. By connecting present technology for the welfare of the planet, the Internet of Things has the ability to improve our environment.

3.7. Reference

- Stahl and Bernd C. (2021). Artificial Intelligence for a Better Future : An Ecosystem Perspective on the Ethics of AI and Emerging Digital Technologies. Cham : Springer International Publishing AG. Available from <https://bit.ly/3rLKcof> [Accessed 17 April 2022].
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