



SOFT SKILLS - CIR_SSK211

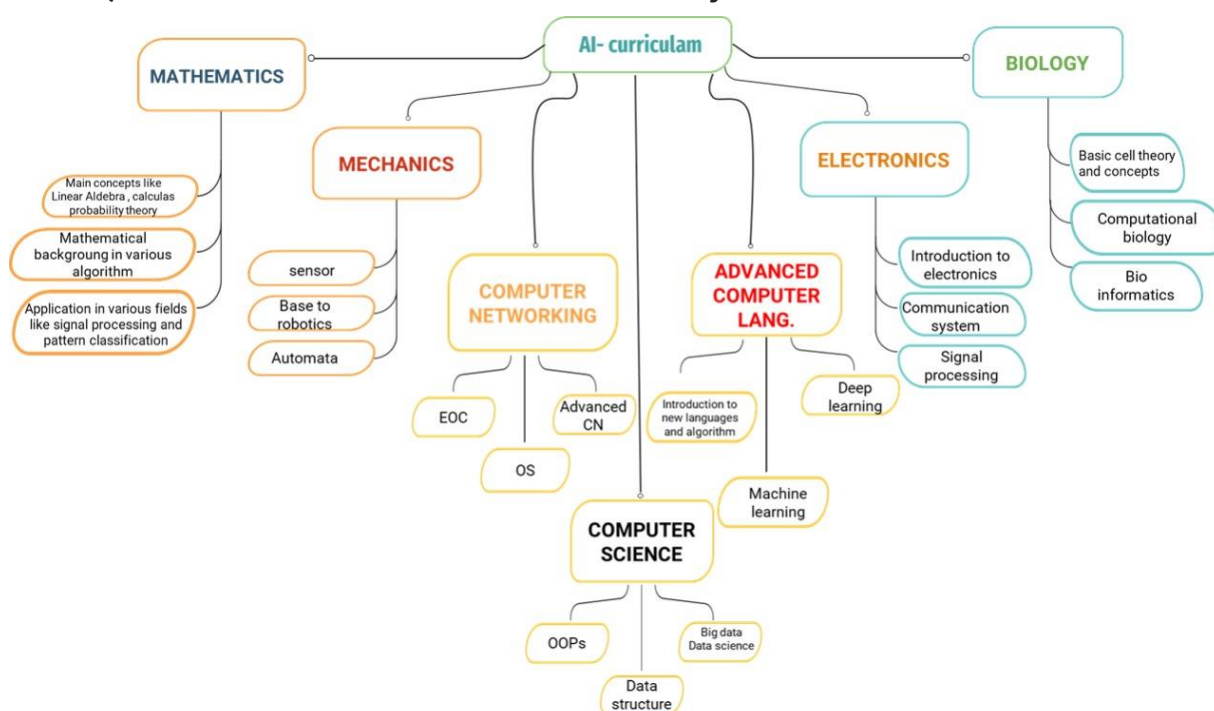
ASSIGNMENT

CSE - AI

ADITYA SINGHAL
ANU VARSHINI SP
DEEPTHI SUDHARSAN
ISHA INDHU S
JAYASHREE O
KAVYA S KUMAR
LAKSHAYA K
MEGHNA B MENON
PODURU RAMA SAILAJA
U ASMITHA

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1) Flow chart of curriculum and related subjects

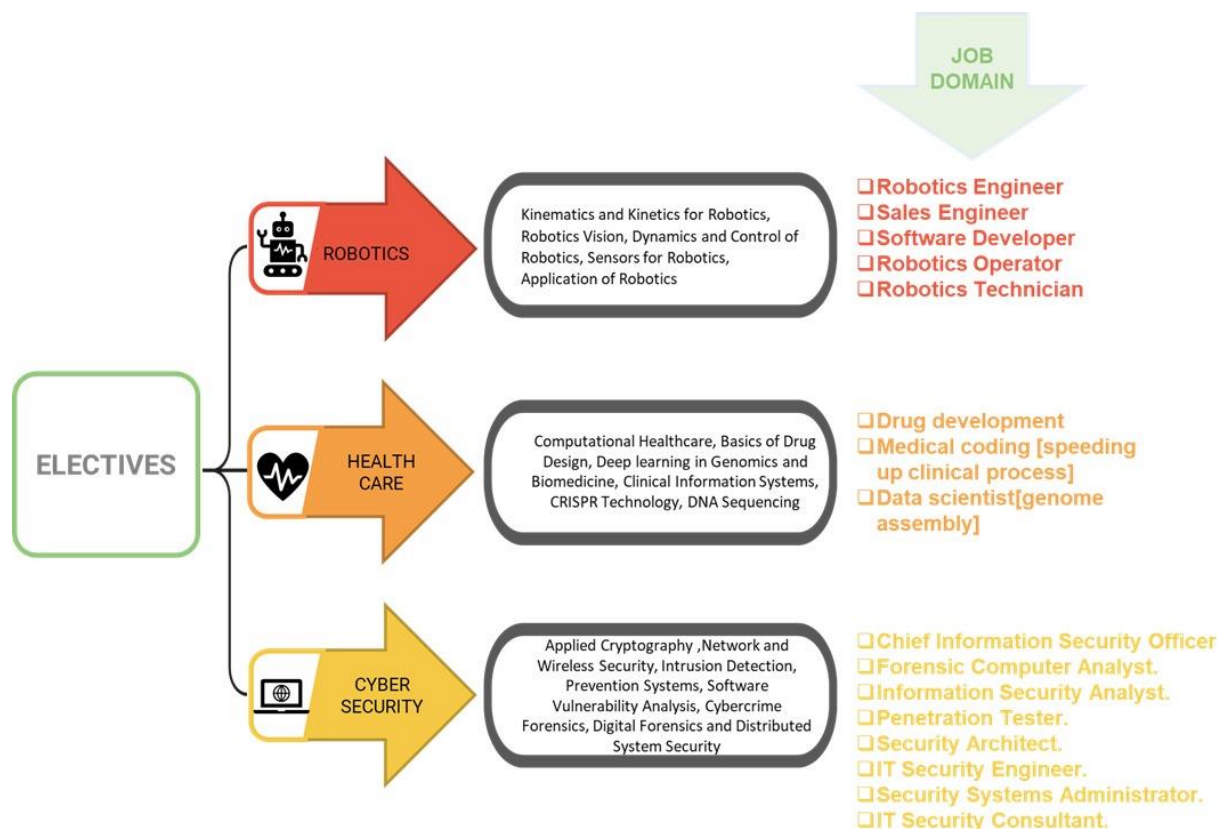


***EOC** – Elements of Computing Systems

***OS** – Operating Systems

***OOPS** – Object Oriented Programming

***CN** – Computer Networking



2) Basic and fundamental knowledge an AI engineer should have

Technical Skills:

- **Programming languages:** A good understanding of programming languages such as Python, Java, R, Scala etc.,
- **Mathematics and Algorithms:** It is recommended to have good knowledge in Linear Algebra, Calculus, Statistics and Probability to thrive in the industry. A solid foundation and expertise in algorithm theory are surely a must which can be applied in Machine Learning.
- **Signal Processing Techniques:** Ability to solve signal processing techniques for feature extraction is an important aspect in Machine Learning. A good understanding of a huge topic called Fourier Series and Fourier Transform is necessary for this.
- **Neural Networks:** Machine Learning is used for complex tasks that are beyond human capability to code. Neural networks have been understood and proven to be by far the most precise way of countering many problems like Translation, Speech Recognition, and Image Classification, playing a pivotal role in the AI department.



Non-Technical Skills:

- **Communication:** Communication is the key in any line of work, AI/ML engineering is no exception. Explaining AI and ML concepts to even to a layman is only possible by communicating fluently and clearly. An AI and ML engineer does not work alone. Projects will involve working alongside a team of engineers and non-technical teams like the Marketing or Sales departments.
- **Domain knowledge:** Before getting into the field, a lot of research has to be done about the field.
- **Leadership quality**

3) List of technical domains to explore, experiment and work

Artificial Intelligence is an accrescent domain yet a domain that can 'laugh all the way to the bank'. Artificial intelligence is the master of many sub-domains and can also be used in the implementation of other domains and play a crucial role.

Technical domains that are worth exploring and working with to advance and expand our knowledge in the AI sector are:

- I. Healthcare and Bioinformatics (also the need of the hour in this ongoing pandemic!)
- II. Pure Computer Science and Information Technology (i.e.) IT.
- III. Mathematics (especially Linear Algebra, Statistics and Probability) and basic Sciences.
- IV. Networking Communication and Signal Processing (AI in this domain is still in its younger and blossoming stages, it will surely work wonders and be of great help in the near future).

Within the subdomains of the huge umbrella of AI, the technical domains that are to be worked on mandatorily for our growth in this field are :

- I. Machine Learning
- II. Expert Systems
- III. Robotics and automation
- IV. Deep Learning
- V. Reinforcement Learning
- VI. Data Sciences
- VII. Neural networks
- VIII. Natural Language Processing
- IX. Computer Vision

4) List of Domain related websites dedicate to acquire knowledge and update

Artificial Intelligence Blogs:

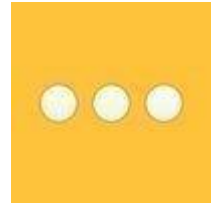
- I. AI Trends –
AI Trends is the leading industry media channel focused on the business and technology of AI.
Website : <https://www.aitrends.com/>
- II. ScienceDaily – Artificial Intelligence News:
Everything on AI including futuristic robots with artificial intelligence, computer models of human intelligence and more.
Website :
https://www.sciencedaily.com/news/computers_math/artificial_intelligence/
- III. Reddit – Artificial Intelligence :
Reddit shares artificial intelligence news, research and generally interesting links.
Website : <https://www.reddit.com/r/artificial/>



IV. Chatbots – Magazine :

Chatbots Magazine is the place to learn about Chatbots, AI, NLP, Facebook Messenger, Slack, Telegram, and more.

Website : <https://chatbotsmagazine.com/>

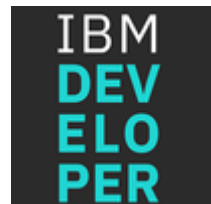


V. IBM Developer – Artificial Intelligence:

IBM Developer offers Open source, code patterns, tutorials, meet-ups, challenges, mentoring, and a global coding community all in one place. Follow us to keep up with articles on Artificial Intelligence.

Website :

<https://developer.ibm.com/patterns/category/artificial-intelligence/>



VI. Lex Fridman – Artificial Intelligence Podcast:

The AI podcast hosts accessible, big-picture conversations at MIT and beyond about the nature of intelligence with some of the most interesting people in the world thinking about AI from the perspective of deep learning, robotics, philosophy, psychology, cognitive science, economics, physics, mathematics & more. Website : <https://lexfridman.com/ai/>

VII. Big Data Made Simple – One source. Many perspectives.

Big Data Made Simple (BDMS) is a leading tech portal in Big Data, Data Analytics, BI, Artificial Intelligence, Machine Learning and Data Science landscape.

Website: <https://bigdata-madesimple.com/>



All the above discussed websites and more are listed in this website given below.

The ones discussed are some of the popular ones. Please visit the below mentioned website to look out for more AI Blogs and website links.

Website : https://blog.feedspot.com/ai_blogs/

Some other interesting websites to explore:

- 🌈 DEEP MIND: “Artificial intelligence could be one of humanity’s most useful inventions. We research and build safe AI systems that learn how to solve problems and advance scientific discovery for all”

Website : <https://deepmind.com/about>

- 🚦 GOOGLE AI : “At Google AI, we’re conducting research that advances the state-of-the-art in the field, applying AI to products and to new domains, and developing tools to ensure that everyone can access AI.”

Website : <https://ai.google/>

5) List of discussion forums exclusively for our field

- <https://aimlcommunity.com/>
- <https://www.youth4work.com/Talent/AI-Artificial-Intelligence>
- <https://www.elementsofai.com/>
- <https://ai-forum.com/>
- <https://github.com/>
- <https://www.geeksforgeeks.org/>
- <https://stackoverflow.com/>

6) Trending programming languages

There are many high-level programming languages that have been developed for various purposes. However, trying to compare two languages that have different benefits and applications is futile. To answer this question, a few different applications of high-level programming languages have been listed and the trending languages in those fields have also been listed along with some of their benefits.

➤ WEB DEVELOPMENT:

I. JAVA SCRIPT:

JavaScript ("JS" for short) is a full-fledged dynamic programming language that can add interactivity to a website.

JavaScript is versatile and beginner-friendly. With more experience, it can be used to create games, animated 2D and 3D graphics, comprehensive database-driven apps, and much more.

JavaScript itself is relatively compact, yet very flexible. Developers have written a variety of tools on top of the core JavaScript language, unlocking a vast amount of functionality with minimum effort. Every modern web browser has JavaScript built-in. This means it can be used from virtually any device. For this reason, mastering JavaScript is extremely important for web developers.



II. PYTHON:

Python is a beautiful language. It's easy to learn and its syntax is clear and concise. Python is a popular choice for beginners, yet still powerful enough to back some of the world's most popular products and applications from companies like NASA, Google, IBM, Cisco and Microsoft among others. One area where Python shines is web development. Python offers many frameworks from which to choose from. These frameworks have been used to power some of the world's most popular sites such as Spotify, Mozilla, Reddit, the Washington Post and Yelp.



➤ MOBILE APP DEVELOPMENT:

I. SWIFT:

Swift by Apple is a ground-breaking programming language for iOS, watchOS, and OS X, which can help develop apps that run flawlessly. Swift ensures secure and safe coding as it easily eliminates all risky code classes and ensures to create a protected environment to create a stable solution. Swift has changed the course of the iOS app development industry. The language has opened new doors to entrepreneurs to make their idea work which was impossible for a long time. Earlier iOS app development used to be time-consuming, difficult and the frequency of app crash was higher.



II. JAVA:

Since Android was officially launched in 2008, Java has been the default development language to write Android apps. This object-oriented language was initially created back in 1995. While Java has its fair share of faults, it's still the most popular language for Android development. Most of the other Android languages are considered a versions of Java or a flavour of Java. Moreover, Java has huge open source support, with many libraries and tools available to make developers life easier.



➤ MACHINE LEARNING:

I. R:

A critical part of a machine learning engineer's day-to-day job roles is understanding statistical principles so they can apply these principles to big data. R programming language is a fantastic choice when it comes to crunching large numbers and is the preferred choice for machine learning applications that use a lot of statistical data. With user-friendly IDE's like RStudio and various tools to draw graphs and manage libraries – R is a must-have programming language in a machine learning engineer's toolkit.



II. JULIA:

Julia is a high-performance, general-purpose dynamic programming language emerging as a potential competitor for Python and R with many predominant features exclusively for machine learning. Having said that it is a general-purpose programming language and can be used for the development of all kinds of applications, it works best for high-performance numerical analysis and computational science. Julia is powering machine learning applications at big corporations like Apple, Disney, Oracle, and NASA.



7) Allied areas to be equipped on

I. Bioinformatics

Bioinformatics is an interdisciplinary field that can be considered as a combination of biology, computer science, mathematics, and statistics. It has been a major benefactor of the recent advancements in Artificial Intelligence (AI). Bioinformatics aims to develop methods, tools, and software to improve our understanding of biological data. It involves the collection, organization, and analysis of a huge amount of biological data. Handling of such a huge amount of data is beyond human beings and AI can help us to a great extent in this voluminous work.

Machine learning, a subfield of AI, has methods that are especially useful at prediction and pattern detection based on large datasets. There are further emerging applications of machine learning within the bioinformatics space as well.

II. Robotics

First, the AI robot or computer gathers facts about a situation through sensors or human input. The computer compares this information to stored data and decides what the information signifies. The computer runs through various possible actions and predicts which action will be most successful based on the collected information.



Some modern robots also have the ability to learn in a limited capacity. Learning robots recognize if a certain action (moving its legs in a certain way, for instance) achieved a desired result (navigating an obstacle). The robot stores this information and attempts the successful action the next time it encounters the same situation.

III. Cyber – Security

Complicated hacking techniques, such as obfuscation, polymorphism, and others, make it a real challenge to identify malicious programs. Besides, security engineers with domain-specific workforce shortage is another issue. The enterprise attack surface is massive and continuing to grow and evolve rapidly. Depending on the size of the enterprise, there are up to several hundred billion time-varying signals that need to be analysed to accurately calculate risk. As a result, analysing and improving cybersecurity posture is not a human-scale problem anymore.

With AI stepping into cybersecurity, experts and researchers are trying to use its potential to identify and counteract sophisticated cyber-attacks with minimal human intervention. AI networks and machine learning, a subset of AI, has enabled security professionals to learn about new attack vectors.

AI and machine learning (ML) have become critical technologies in information security, as they are able to quickly analyse millions of events and identify many different types of threats – from malware exploiting zero-day vulnerabilities to identifying risky behaviour that might lead to a phishing attack or download of malicious code. These technologies learn over time, drawing from the past to identify new types of attacks now. Histories of behaviour build profiles on users, assets, and networks, allowing AI to detect and respond to deviations from established norms.

IV. Virtual Assistants

In contrast to computers that have a keyboard and mouse, or tablets and phones with a touchscreen, virtual assistants let us interact using natural spoken language. Voice interfaces drastically simplify our interaction with technology.



To fulfil requests, virtual assistants are built on a complex pipeline of AI technology:

- A Wakeword (WW) detector runs on the device, listening for the user to say a particular word or phrase to activate the assistant. It's also possible to activate the assistant in other ways, like a push-to-talk button.
- Automatic Speech Recognition (ASR) converts spoken audio from the user into a text transcription.
- Natural Language Understanding (NLU) takes the transcription of what the user said and predicts their intention in a way that's actionable. This component understands that users can make the same request in a multitude of different ways that should all have the same outcome.
- The Dialogue Manager (DM) decides what to say back to the user, whether to take any action, and handles any conversation.
- Text to Speech (TTS) is the output voice of the assistant

V. AI in eCommerce

The use of artificial intelligence in online shopping is transforming the E-commerce industry by predicting shopping patterns based on the products that shoppers buy and when they buy them. For example, if online shoppers frequently buy a particular brand of rice every week, then the online retailer could send a personalized offer to these shoppers for this product, or even use a machine learning-enabled recommendation for a supplementary product that goes well with rice dishes.

Ecommerce AI tools or AI-enabled digital assistants such as the Google Duplex tool is developing capabilities like creating grocery lists (from the shopper's natural voice) and even placing online shopping orders for them.

8) **Top 10 Software Trending in Artificial Intelligence**

I. Deep Vision

Designed specifically for the facial analysis of individuals, Deep Vision is a perfect AI solution for safety, security, and business intelligence. The software is efficient in

monitoring designated zones to identify the people over time based on their age, gender, and other particulars.

II. Braina

It is one of the few top-rated AI software that supports several languages. Braina can also be used as virtual speech recognition software. With the help of this, software speech can be converted into text easily and quickly. This productivity-focused, a business intelligence platform supports over 100 languages.

III. Google Cloud Machine Learning Engine

Whether you are looking forward to starting a new business or planning for the digital transformation of your existing business, Google AI technologies, and Cloud solutions will help you succeed incredibly. Google Cloud Machine Learning Engine is a perfect solution for training, tuning, and analysing your model. It comes with Compute Engine, Cloud SDK, Cloud Storage, and Cloud SQL. The software also offers the benefit of secure and durable object storage. Its libraries and command-line tools allow users to leverage Google Cloud. Additionally, there are relational databases for SQL Server, MySQL, and PostgreSQL.

IV. Engati

With Engati, users can create chatbots of different scales and complexities with ease. It comes with over 150 templates so that individuals can quickly get started with a chatbot. Plus, the software also includes advanced Conversation Flow builder, high-end integration ability, and capabilities for deploying bots on the website or any of the available channels. The platform has made chatbot building easier than ever. There are sections designed to deploy, build, analyze, and train the bots. Moreover, you'll be benefitted chatbot user info, portal users, live chat, and campaigns, broadcast using this software.



V. Azure Machine Learning Studio

Azure Machine Learning Studio, is best for creating business intelligence systems that can use that for predictive analytics. It's an advanced tool used by users to move objects to the interfaces. With this software in use, you'll have the

opportunity of exploring new techniques of building innovative, AI-powered applications on a cloud. Azure also offers the benefits of creative tools, AI services, and scalable infrastructure. Plus, you'll also get access to the resources needed for building smart solutions.

VI. Tensor Flow

Highly popular open-source software, Tensor Flow is a perfect solution for the professionals looking for an advanced numerical computation tool. It comes with a flexible architecture for computation deployment across multiple platforms, including TPUs, CPUs, and GPUs). Plus, it can be deployed on desktops, servers, mobile devices, and others. Some of its core components include Natural Language Processing, decision making, chatbot, image recognition, data ingestion, multi-language, visual search, speech recognition, virtual assistant, machine learning, and workflow automation.



VII. Cortana

Like Google Now and Siri, Cortana is a smart personal assistant that helps users with application launch, appointment scheduling, and many other virtual tasks. It is also capable of adjusting the device settings like toggling Wi-Fi to off and on mode. The tool can also answer your queries, set reminders, switch on the light, order pizza online, etc.

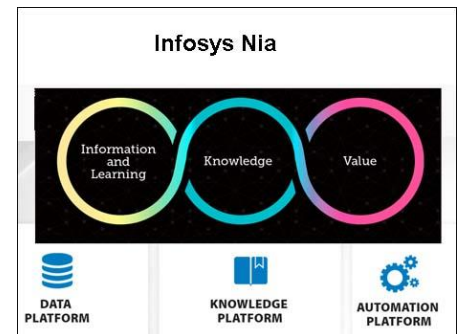
VIII. IBM Watson

It is an AI-based computer system designed to answer the questions of the users. IBM Watson is integrated with cognitive computing – a blend of techniques, including reasoning, machine learning, natural language processing, AI, and others. Named after Sir Thomas J. Watson – the first CEO of IBM, this tool allows integration of artificial intelligence into various business processes. It helps in

increasing the productivity and efficiency of the organization so that it can achieve better results.

IX. Infosys Nia

Infosys Nia is a highly rated business Intelligence software that can collect info from legacy systems, people, and processes. It aggregates the data into a knowledge base and automates IT processes and business tasks. The software is designed to reduce manual effort and find solutions to customer problems requiring imagination, creativity, and passion.



X. Playment

It is a data labelling platform that can generate training data at a large scale for robotic models. Playment empowers the businesses that deal with Drones, Mapping, Autonomous Vehicle, and similar spaces. The tool has been chosen by several high-profile research institutes and organizations like CYNGN, Drive AI, and Starsky Robotics.

9) List of top 10 technologies that one should be aware of

Technology is the constant change. A technology or a programming language that is trending today may become outdated by the next few days! As more and more funds are invested in research and development, computer scientists and professionals are constantly improving the existing technologies to get the most out of them. To keep up with this crazy pace of development, we have to keep learning the latest technology concepts. This helps in our preparation for getting the highest paying jobs in the field of our choice. Widening our arsenal of tools also enhances our value as professionals in the companies that we would work for in the future.

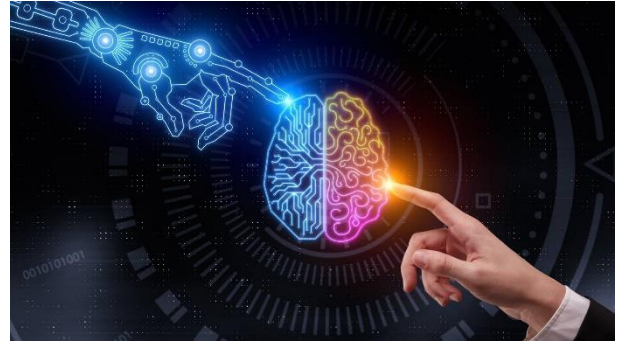
Let us go through some of the top technologies in requirement as of now-

I. ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI) is the technology used for equipping computer systems with the ability to make decisions like humans.

When AI programs are fed to systems, the aim is to mimic human intelligence for performing complex tasks such as pattern recognition, speech recognition, weather forecast and medical diagnosis. AI is used in navigation-based applications, voice assistants, video streaming services, IoT devices and in search engines. AI will

create jobs in areas such as testing, support, maintenance, programming and data science. Software developers who know AI earn much more than developers who don't.



So, learning AI will help secure jobs such as

- Machine Learning Engineer
- Data Scientist
- Computer Vision Engineer
- Business Intelligence Developer
- Data Analyst

II. DATA SCIENCE

Data Science is the technology that helps to make sense of complicated data. This includes business data, sales data, customer profile information, server data, and financial figures. Most of this data is in the form of huge data sets that are unstructured. The role of data scientists is to convert these unstructured data sets into structured datasets. Then, these data sets can be analysed to identify patterns and trends. These patterns are useful for understanding the company's business performance, customer retention, and how these areas can be improved.

Future scope of data science which will create opportunities for the following career roles:

- Data Scientist
- Data Architect
- Business Intelligence Manager
- Data Engineer

- Data Analyst
- Business Analyst

III. INTERNET OF THINGS (IoT)

The IoT (Internet of Things) is a network of devices that are connected to each other. Their devices can interact and share data with each other. IoT not only enables the connection between different devices but also their remote access. For example, you lock doors of your car remotely, preheat your ovens and geysers. The Fit-Bit that you use for tracking the number of calories you burn also runs on IoT technology. IoT chips embedded on machines help businesses to assess the performance of those machines and assist in their maintenance.



Learning this latest technology will help you find jobs such as:

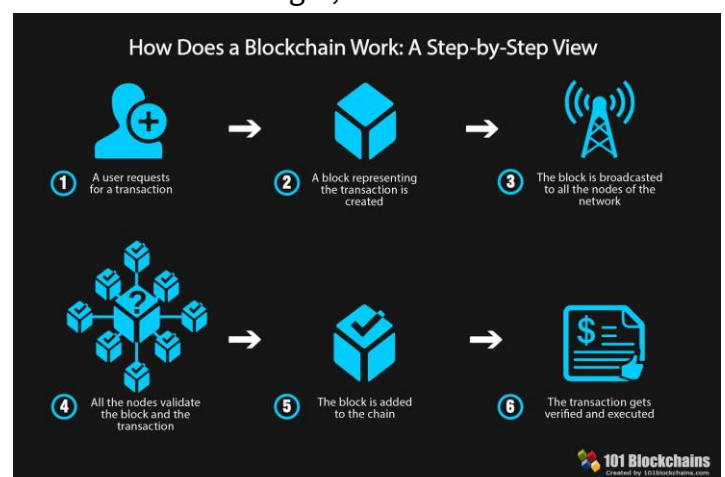
- IoT Software Developer
- System Design Engineer
- IoT Product Manager
- IoT Research Developer
- IoT Solution Architect

IV. BLOCKCHAIN

Blockchain is the foundational technology that powers electronic currencies such as Cryptocurrencies. In simple terms, a Blockchain is an electronic ledger that can be shared among different users. This helps in creating a record of transactions that cannot be altered. Each of these records is time-stamped and linked to the previous one. So, every time a new transaction is added to the ledger, it is stored as another block in the chain of transactions – hence the name. After new data is fed into a block, it cannot be erased. This makes technology verifiable and secure.

There is a rise in careers in Blockchain and it will create different job positions which are as follows:

- Blockchain Developers



- Blockchain Quality Engineer
- Blockchain Legal Consultant or Attorney
- Blockchain Engineer

V. ROBOTIC PROCESS AUTOMATION (RPA)

Robotic Process Automation (RPA) is a technology used for automating daily tasks, similar to artificial intelligence. Here, the software is used for automating repetitive tasks such as handling and replying to emails, processing transactions, and handling business data. This technology is used for automating tasks for low-level employees to higher-ranking officials.

The different RPA job roles are as follows:

- RPA Developer
- RPA Business Analyst
- RPA Consultant
- RPA Solution Architect
- RPA Project Manager

VI. VIRTUAL REALITY

VR is the technology by which you can immerse yourself in an environment that seems astonishingly realistic. It is the use of computer technology for creating a simulated environment. Senses such as touch, hearing, smell, and vision are simulated in these environments. Using VR gear such as headsets, you can walk around and play the game in that 3D world. Augmented Reality (AR) is the technology used for improving this virtual environment. The major players in this field are Facebook's Oculus Rift, Sony's PlayStation VR (PSVR), and the HTC Vive. The VR technology is not only used for entertainment, but it is also used by the Navy and Coast Guard for training staff.



VR job positions you can look out for:

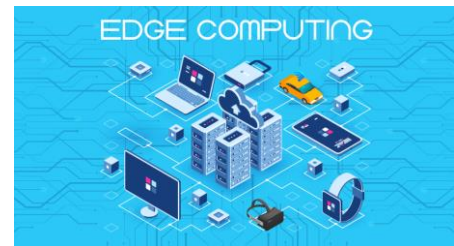
- Content Producer
- AR and VR Content Writers
- Product Management
- Software Engineer
- UI and UX Design

- Quality Assurance

VII. EDGE COMPUTING

Edge computing is the latest technology trend that is getting famous by the day. The technology is based on the philosophy of bringing computing power as close to the data source. This helps in reducing bandwidth and latency.

The technology aims to run fewer processes in the cloud and shifting those processes to locations such as the user's system or an edge server. Bridging this gap between the data and the computation reduces the long-distance communication between the server and the client, which in turn enhances the speed of the process. This is why edge computing is used for handling time-sensitive data stored in remote locations that have limited connectivity to the central location. The technology will make cloud computing and IoT devices faster. The technology will be popular in areas such as healthcare, retail, and manufacturing. Thus, it will open the doors to many job opportunities.



VIII. BIG DATA

Companies use the big data accumulated in their systems to improve operations, provide better customer service, create personalized marketing campaigns based on specific customer preferences and, ultimately, increase profitability. Businesses that utilize big data hold a potential competitive advantage over those that don't since they're able to make faster and more informed business decisions, provided they use the data effectively.

Different job positions which are as follows:

- Big Data Analyst
- Big Data Developer
- Data Engineer / Big Data
- Big Data Engineer

IX. INTELLIGENT APPS

Intelligent apps are software applications that make use of AI components such as machine learning, deep learning, data analytics, robotics, and natural language processing. They help you in making decisions based on real-time data or historical data. Examples of Intelligent apps are voice assistants such as Siri, Google Assistant,

and Alexa. As companies such as Google, Apple, and Oracle continue investing in these applications, it is bound to create a lot of jobs in the future.

X. 5G-TECHNOLOGY

5G network will soon find its place within the technology market. It will also bring an enormous amount of advantages, like high internet speed, higher capacity, and lower latency. Such benefits are sure to make it one among the main technological trends to be observed in 2020 and even within the years to return.

Different job positions which are as follows:

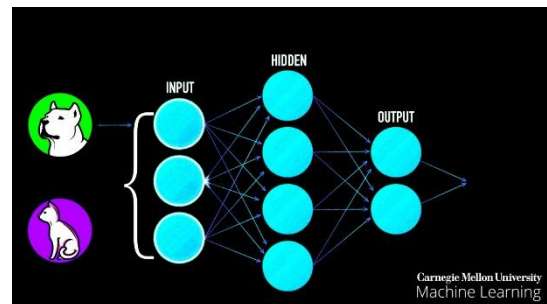
- Senior 5G Standards Architect
- 5G RF Software Development
- 5G RAN Standardization Expert



10) Upskilling course that is required to be done

I. Machine Learning

Machine Learning courses help engineers, software developers, and other IT professional master skills like Python, BD processing using Spark, Deploy ML Models, Supervised & Unsupervised ML Models, Predictive Analytics & Statistics. This program can help in fetching a Big Data Analyst, Data Engineer, Data Scientist, Machine Learning Engineer job.



II. Networking in Google cloud specialisation

A specialisation in Networking in Google Cloud will help participants understand GCP networking technologies, such as:

- Google Virtual Private Cloud (VPC) networks, subnets, firewalls
- Interconnection among networks
- Load balancing
- Cloud DNS; Cloud CDN.

It will also allow people to explore common network design patterns and automated deployment using Deployment Manager.

III. AWS (Amazon Web Service) Solutions Architect Course

AWS can help professionals get a job in cloud computing. AWS Solutions Architect Course will help the employees and professionals gain an in-depth understanding of Amazon Web Services (AWS) architectural principles and services such as IAM, VPC, EC2, EBS, and more. It can also help pass the AWS Certified Solutions Architect - Associate Certification exam by Amazon.



IV. Big Data

Big Data is not a technology, but a practice that helps in analysing massive amounts of data to gain insights and improve decision making. As the sheer volume of data increases on a day to day basis, professionals skilled in Big Data are highly in demand. These certifications can help you land a job in the thriving field of Big Data:

- Big Data Engineer Master's Program
- Big Data Hadoop Administrator
- Big Data Hadoop and Spark

V. Data Science

Data Science has taken the world by storm and is one of the most in-demand career choices today. Opportunities in the field are endless, and job roles in Data Science promise high-paying salaries. Certifications that can help you move into data science domain include:

- Data Scientist Master's Program
- Business Analytics Expert
- Data Science Certification with R Programming
- Data Analyst Master's Program

VI. Artificial Intelligence

Artificial Intelligence courses will let us master various aspects of artificial neural networks, supervised and unsupervised learning, logistic regression with a neural network mindset, binary classification, vectorization, Python for scripting Machine Learning applications, and much more.

Intellipaath is providing an Artificial Intelligence course using TensorFlow is an industry-recognized training program. This course will help you master:

- Convolutional neural networks (CNN), perceptron in CNN
- TensorFlow, TensorFlow code
- Transfer learning, graph visualisation
- Recurrent neural networks (RNN)
- Deep Learning libraries, GPU in Deep Learning
- Keras and TFLearn APIs
- Backpropagation, and hyperparameters via hands-on projects



VII. Cloud Computing

Cloud computing is computing based on the Internet. Previously, companies had to use software downloaded into a physical computer or server. Cloud computing allows people to work on the same applications through the Internet from different systems, and has been widely adopted and is now used at the majority of organizations worldwide. These certifications can help you launch or advance a career in cloud computing:

- Microsoft Azure Certification
- Blockchain Developer

VIII. Networking

Every company needs an efficient and well-maintained computer network even in the age of cloud computing. Courses that can help you move ahead as a hardware and network professional include:

- CCNA Routing & Switching Certification Training
- CCNP-Routing & Switching Certification Training



IX. Software Development

Changes happen at lightning speed in the world today and software has to keep up, driving demand for software developers who can build the new apps as needed. Many certifications can help you transition into or move up in the software development field, including:

- Full Stack Web Developer
- Automation Testing
- Java Certification
- C Programming

- SQL Database Training

11) List of domain related job fields

I. Machine Learning Engineer

Machine learning engineers are involved in building and maintaining self-running software that facilitates machine learning initiatives. They are in continuous demand by the companies and their position rarely remains vacant. They work with huge chunks of data and possess extraordinary data management traits.

They work in the areas of image and speech recognition, prevention of frauds, customer insights, and management of risks. To become a machine learning engineer, one must have sound command in applying predictive models dealing with magnificent data. Programming, computing, and mathematics are essential to becoming successful as a machine learning engineer.

II. Data Scientist

Data scientists are charged with collecting, analysing, and interpreting large, complex datasets by leveraging both machine learning and predictive analytics. They also play a vital role in developing algorithms that enable the collection and cleaning of data for analysis. The inferences gained are influential in tackling various issues concerned with the business. Depending upon different data patterns, past and present information, data scientists make various predictions.

III. Big Data Engineer

Compared to data scientists, this role can feel more involved, as big data engineers and architects typically are tasked with planning, designing, and developing the big data environment on Hadoop and Spark systems. Their primary task is to build and effectively administer big data of an organization. They also have to carry out the function of obtaining outcomes from big data in a robust manner.



IV. Business Intelligence Developer

Business intelligence developers play a key role in improving the efficiency and profitability of a business. The primary responsibility of a Business Intelligence Developer is to consider the business acumen along with AI. They recognize

different business trends by assessing complicated data sets. They help in swelling the profits of a company by preparing, developing, and nourishing business intelligence solutions.

It is a career that's in high demand and commands an annual median salary of \$92,278. Business intelligence developers are typically responsible for designing, modelling, and maintaining complex data in highly accessible cloud-based data platforms.

V. Research scientist

Research scientists undertake efforts in performing extensive research dealing with applications of machine learning and machine intelligence. A research scientist is one who has gained expertise in the field of applied mathematics, statistics, deep learning, and machine learning.

VI. Robotics Scientist

A reduction in jobs will indeed take place due to the emergence of robotics in the field of AI. Conversely, jobs will also rise as robotics scientists are in incessant demands by major industries for programming their machines. The robots will help in carrying out certain tasks efficiently.

12) Associations which offer Membership and Add Value to your Profile

- I. ASSOCIATION FOR THE ADVANCEMENT OF ARTIFICIAL INTELLIGENCE (AAAI)
Founded in 1979, the Association for the Advancement of Artificial Intelligence (AAAI) (formerly the American Association for Artificial Intelligence) is a non-profit scientific society devoted to advancing the scientific understanding of the mechanisms underlying thought and intelligent behaviour and their embodiment in machines. AAAI aims to promote research in, and responsible use of, artificial intelligence. AAAI also aims to increase public understanding of artificial intelligence, improve the teaching and training of AI practitioners, and provide guidance for research planners and funders concerning the importance and potential of current AI developments and future directions.

II. IAENG (International Association of Engineers) Society of Artificial Intelligence

The IAENG Society of Artificial Intelligence (ISAI) is organized for the engineers and the scholars in the Artificial Intelligence discipline. Through regularly scheduled conferences and workshops on the Artificial Intelligence, the IAENG Society of



Artificial Intelligence serves as a forum for networking, information sharing, idea exchange and problem solving for the Artificial Intelligence community.

The committee members of the IAENG Society of Artificial Intelligence can voluntarily organize different activities for its Society members, and take part in organizing the IAENG conferences and workshops.

III. European Association for Artificial Intelligence (EurAI)

The European Association for Artificial Intelligence EurAI (formerly ECCAI) was established in July 1982 as a representative body for the European Artificial Intelligence community. Its aim is to promote the study, research and application of Artificial Intelligence in Europe.

IV. Artificial Intelligence Association of India (AIAI)

Founded in 2009, the Artificial Intelligence Association of India (AIAI) is a non-profit scientific society (Registered under Tamil Nadu Societies Registration Act 1975- Reg No. :581/2009) devoted to advancing the scientific understanding of the mechanisms underlying thought and intelligent behaviour and their embodiment in machines. AIAI also aims to increase public understanding of artificial intelligence, improve the teaching and training of AI practitioners, and provide guidance for research planners and funders concerning the importance and potential of current AI developments and future directions.



V. 3AI

3AI is a confluence of leading and marquee AI & Analytics thought leaders, experts, influencers and practitioners on one platform. 3AI platform enables the leaders to engage with students and working professionals for competency augmentation and career enhancement opportunities through guided learning, focused knowledge sessions, 1:1 mentorship, internship & placement assistance in AI & Analytics sphere.

