White Space

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SIR GURUDAS MAHAVIDYALAYA

"Knowledge is power.
Unity is strength."

WHITE SPACE

Dear readers,

It gives me great pleasure to welcome you to the first edition of "The White Space-2023" the magazine of the Computer Science Department in collaboration with the IT Club of the Student unit. The magazine aims to provide a platform for students and faculty to showcase their talent, share their knowledge, and stay updated with the latest trends and innovations in the field of computer science.

The magazine contains a wide range of IT-related articles, including tips and tricks of daily use software, programming languages, and computer hardware. Our team of dedicated writers has put in a lot of effort to bring you the most informative and engaging content that will help you stay ahead of the curve.

This magazine is not just about reading, but it also encourages students to participate in the writing process. We believe that writing is an essential skill that students should possess to excel in their careers. Hence, we urge all students to contribute to future editions of the magazine.

I would like to thank the Editorial Board and the Computer Science Department for their unwavering support in making this magazine a reality. We hope that this initiative will become a regular practice and inspire more students to get involved in the IT culture.

Finally, I would like to encourage all students to make the most of this magazine and take advantage of the knowledge shared in it. Let us work together to make the Computer Science Department a hub of innovation and excellence.

Dr. Manisankar Roy

Principal

Sir Gurudas Mahavidyalaya

Dear readers,

We are thrilled to present to you the very first edition of "The White Space-2023," a magazine that represents the collaborative effort of the Computer Science Department and the IT Club of the Student Unit. This magazine aims to create a platform for the students to share their IT knowledge and experiences and to promote the IT culture in our community.

In this edition, you will find a variety of articles related to computer science and information technology. From the fundamentals of programming to the latest trends in the IT industry, our contributors have covered a wide range of topics that cater to both beginners and advanced readers.

One of the goals of this magazine is to encourage students to write and share their experiences with the rest of the community. We believe that writing is an essential skill that can help students to communicate their ideas effectively and make them more confident individuals. We encourage all the students to contribute to the next edition of the magazine and make it even more diverse and informative.

The Computer Science Department is well equipped with two labs that have internet facilities and sufficient books to cater to the needs of students. We are also continuously striving to extend other facilities such as faculty development and other infrastructural development to create a conducive learning environment for our students. Previously, Department of Computer Sc. Started with CMAV (Major) from 2008 and later Computer Sc is upgraded intake capacity is now 25. The graph of improvement inclining as per result, infrastructure and student strength. A few students are able to place themselves in TCS, Contingent and many others are able to be involved in Higher studies like M.Sc. (CS), MCA or B.Tech. (Lateral) etc.

We would like to thank the editorial board and the principal for providing us with this opportunity to create this magazine. We hope that "The White Space-2023" will become a regular publication and serve as a valuable resource for the students in the years to come.

Finally, we would like to express our gratitude to all the contributors who have made this edition possible. We hope that you will find this magazine informative, engaging, and enjoyable.

Debashish Barman, Assistant Professor.

HOD, Computer Sc. Department.

"The computer was born to solve problems that did not exist before."

*— Bill Gates*

Convolution Neural Networks

Debashish Barman, Asst. Professor.
HOD, Computer Science Dept.

Convolution Neural Networks:

Convolution Neural Networks, or CNNs, are a type of deep learning neural network that have proven to be highly effective in image classification and object recognition tasks. They are based on the idea of convolving an input image with a series of learnable filters, each of which extracts a specific feature from the image. In this article, we will explore how CNNs work, including each stage of the process, along with their uses and limitations.
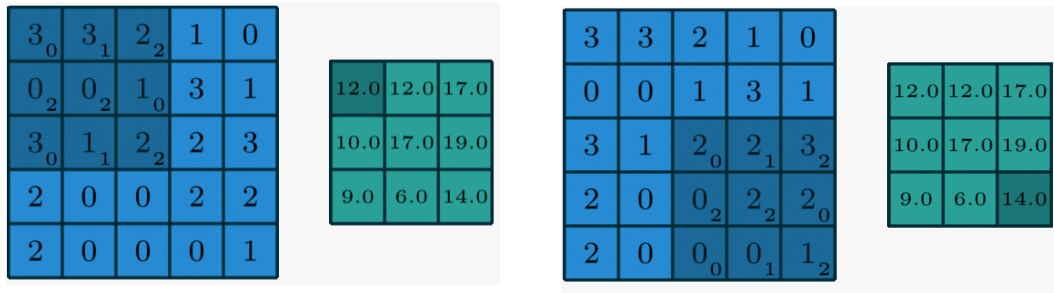
How CNN works:

The general architecture of a CNN consists of several layers that are arranged in a specific order. Each layer performs a specific task, and the output of one layer serves as the input for the next layer. The three main types of layers in a CNN are the convolution layer, the pooling layer, and the fully connected layer.
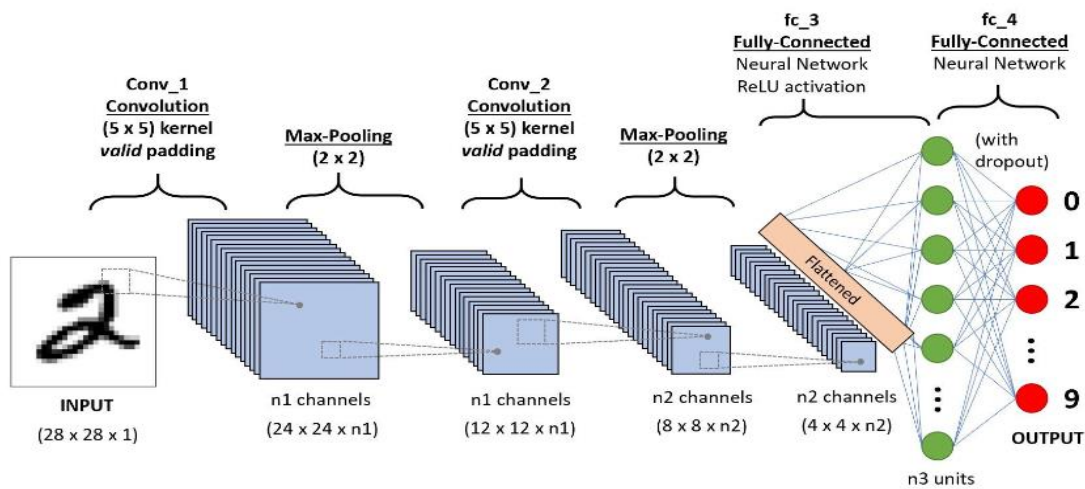
Convolution layer:

The convolutional layer is the core building block of a CNN. It performs a mathematical operation called convolution between the input image and a set of filters. Each filter is a small matrix that slides over the input image, pixel by pixel, and computes the dot product between the filter and the corresponding pixels in the input image. The output of this operation is a feature map that represents the presence of the filter's features in the input image.

3_0	3_1	2_2	1	0
0_2	0_2	1_0	3	1
3_0	1_1	2_2	2	3
2	0	0	2	2
2	0	0	0	1

12.0	12.0	17.0
10.0	17.0	19.0
9.0	6.0	14.0

3	3	2	1	0
0	0	1	3	1
3	1	2_0	2_1	3_2
2	0	0_2	2_2	2_0
2	0	0_0	0_1	1_2

12.0	12.0	17.0
10.0	17.0	19.0
9.0	6.0	14.0

In the diagram above, the input image is a 5x5 matrix, and the filter is a 3x3 matrix. The filter is applied to each 3x3 subregion of the input image, resulting in a 3x3 feature map.

During training, the filters are learned through backpropagation. The network adjusts the filter values to minimize the difference between the predicted output and the actual output.

The pooling layer reduces the dimensionality of the feature maps generated by the convolutional layer. It works by partitioning the feature map into non-overlapping regions and computing a single value for each region. The most common pooling operation is max pooling, which computes the maximum value in each region.

Max pooling

8	7	5	3
12	9	5	7
13	2	10	3
9	4	5	14

2x2 pooling, stride 2

12	7
13	14

Average pooling

9	5
7	8
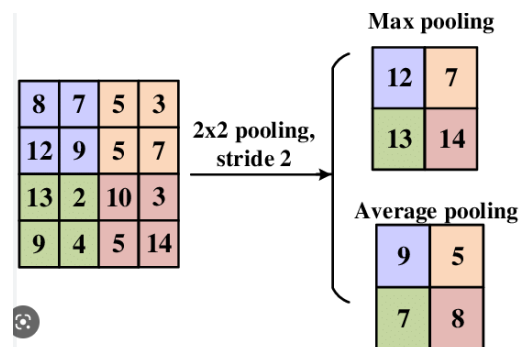
In the diagram above, the input feature map is partitioned into non-overlapping 2x2 regions, and the maximum value in each region is selected to produce a 2x2 output.

Pooling layers help to reduce overfitting and improve computational efficiency by reducing the number of parameters in the model.

Fully connected layer:

The fully connected layer is a traditional neural network layer that takes the flattened output from the previous layers and computes the final output. It connects every neuron in the previous layer to every neuron in the fully connected layer, and each connection is assigned a weight.
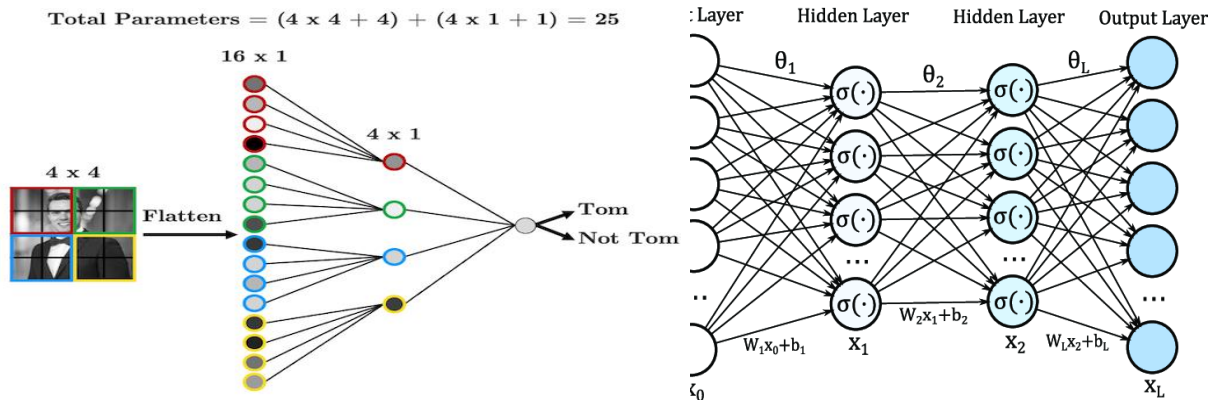
Activation function: An Activation Function decides whether a neuron should be activated or not. This means that it will decide whether the neuron's input to the network is important or not in the process of prediction using simpler mathematical operations. In the diagram above, the flattened output from the previous layers is fed into a fully connected layer with three neurons. Each neuron computes a weighted sum of its inputs and applies an activation function, such as the sigmoid or ReLU function, to produce the final output.

Sigmoid
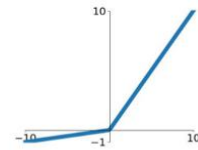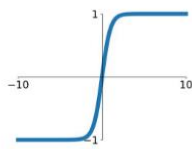$$\sigma(x) = \frac{1}{1+e^{-x}}$$
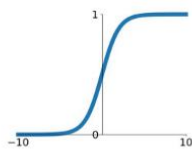
tanh
$$\tanh(x)$$

ReLU
$$\max(0, x)$$

Leaky ReLU
$$\max(0.1x, x)$$

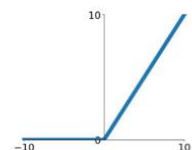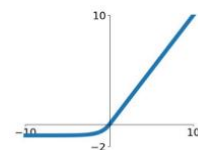**Maxout**
$$\max(w_1^T x + b_1, w_2^T x + b_2)$$

ELU
$$\begin{cases} x & x \geq 0 \\ \alpha(e^x - 1) & x < 0 \end{cases}$$

Disadvantages of CNN models are:

- ✓ Classification of Images with different Positions
- ✓ Adversarial examples
- ✓ Coordinate Frame
- ✓ Other minor disadvantages like performance

The future scope of CNN is vast and promising. Here are some potential areas where CNN is expected to make significant contributions:

- ✓ Autonomous vehicles: CNN can help in the development of self-driving cars by identifying objects, predicting motion, and detecting potential hazards on the road.
- ✓ Medical diagnosis: CNN can help in diagnosing diseases from medical images such as X-rays, MRIs, and CT scans. It can also help in analyzing pathology slides for cancer detection.
- ✓ Robotics: CNN can aid in object recognition and tracking, enabling robots to navigate through complex environments and perform tasks such as object grasping and manipulation.
- ✓ Natural Language Processing: CNN can be used for text classification tasks such as sentiment analysis, spam detection, and topic modeling.
- ✓ Augmented reality and virtual reality: CNN can enable augmented reality applications to identify and track objects in real-time, and create immersive virtual reality experiences.
- ✓ Agriculture: CNN can aid in crop monitoring and disease detection, enabling farmers to make informed decisions about their crops.

Conclusion:

In conclusion, CNN has a vast range of applications, and its future scope is promising in various fields such as autonomous vehicles, medical diagnosis, robotics, natural language processing, augmented reality, virtual reality, and agriculture.

The Convergence of the Internet of Things and Artificial Intelligence.

DR. MOUMITA CHAKROBORTY
Faculty, Computer Science Dept.

Machine learning (ML) is a technology subset of AI that explores through data, realizes them, predicts the pattern, and independently forms an algorithm, thus allowing the computers to become independent and program automatically. Recent advances in the areas of Artificial Intelligence (AI) in the informatics field, Cyber-Physical Systems (CPS) in the production field, and Internet of Things (IoT) in the logistics and transportation field have induced a tremendous growth and innovation potential for global value chain setups. Internet of Things technology and Artificial Intelligence are new sciences that help us in reimagining our daily lives. These both are the technologies of the future, which are also counted among superpowers of innovation. The overwhelming increase of ubiquitous data, connections, and services brings serious challenges, in particular facing the demanding requirements of the Internet of Things (IoT).
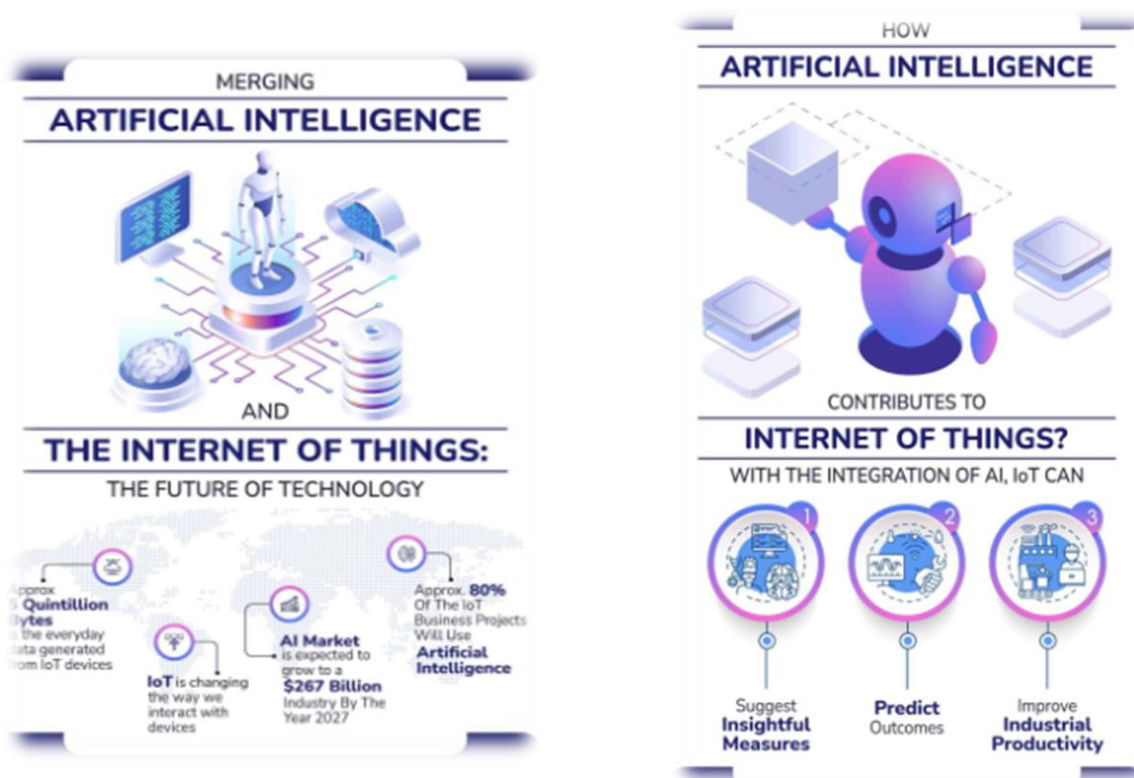
In order to seek better solutions and achieve more efficient information retrieval, artificial intelligence (AI) serves as a strong technical earthquake and contributes a lot to data analysis and decision making. Naturally, if the number of smart devices will increase, the swaths of data will increase too. This is where AI plays a crucial role by connecting and integrating with IoT and lending its capabilities to effectively handle a large amount of data. IoT is empowered by the three emerging technologies – AI, 5G networks, and Big Data. The interconnected devices are thus, transforming our lives like never before. We can now interact with our devices at home, or from anywhere within fractions of seconds.
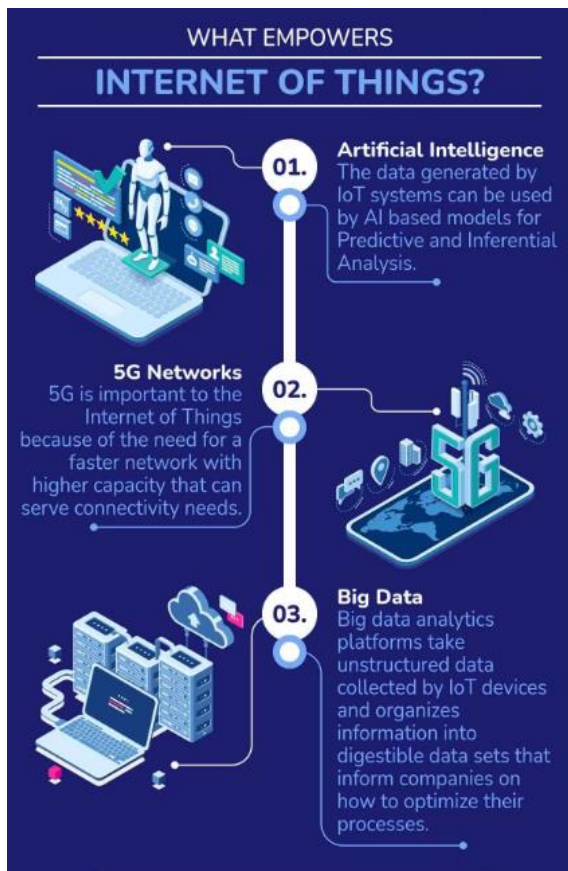
Thus, merging the two technologies – AI and IoT is a brilliant idea to form smart cities, smart industries, smart homes, and lots of other innovations. Here is an infographic that depicts how AI and IoT combined can be the future of technology.

"The combination of IoT and machine learning has the potential to revolutionize industries from transportation to agriculture, by enabling predictive maintenance, real-time monitoring, and autonomous decision-making." - Sundar Pichai, CEO of Google

INNOVATION

Dr. Suchismita Majumdar
Librarian, Sir Gurudas Mahavidyalaya.

INNOVATION: It's all about thinking out of the box.

A SOLUTION BASED APPROACH ACCELERATES INNOVATION BY PREPARING YOUR MIND FOR FINDING A POSSIBLE SOLUTION.

What do you think about this picture?

Humans have natural thinking patterns based on repetitive activities and knowledge. So we apply that in similar situations. Those potentially restrict us in developing new ways at looking at things, understanding things and solving problems. Innovation results in developing a new method, a new idea, a new product or a new process or service. Objective of innovation is to gain efficiency, effectiveness or competitive advantage. Creativity and design thinking are the key to innovation. "Is it possible?" is the question whose answer is innovation.

INNOVATION:

- ✓ A NEW METHOD.
- ✓ A NEW IDEA.
- ✓ A NEW PRODUCT.
- ✓ A NEW PROCESS OR SERVICE.

INVENTION VS INNOVATION:

Let's see a few examples.

- ✓ Innovation helps to provide unique offerings, provide improved product performance and design your unique offerings. Example: customize your own products or add new features, introduce new technological add-ons etc. FAN: Fans (no dust), fans with built-in light, fans with antimicrobial coatings, fans with remote control features, energy efficiency and many more can be considered as innovation. IOT gives a newer dimension for operating fans. However, fans were invented to solve the basic problem of circulation of air to

get relief from hot weather and create a breeze. The requirements in the form of "*What if the fan can be operated remotely?*" or "*what if fans required no dusting*?" may have led to these newer possibilities to a fan.

✓ Innovation can also be products with associated service. Example: Watches with health data. Watches were invented to solve the problem of being able to see the time. However innovative thinking or design thinking led to watches having so many essential features to be in the market and be able to satisfy customer service requirements. Otherwise it is likely that regular watches shall fail to attract buyers anymore and with time the companies face the consequences.

✓ Product system
   o Example: Google Workspace solves the problem of sharing, access, creation of documents and many more with more features and flexibility. It is being a help in improving productivity at the workplace, academic performance and
   o many more.

✓ In the education sector innovation is being very important now. Thinking out of the box has surely led to online modes of learning where place and time shall not be a barrier in teaching-learning anymore.

✓ Communication and networking developers. Music makers. are actually having design thinking skills.

Innovative thinking gives advantage over other similar things. Most of you thought that the picture at the beginning of this write-up is a coil spring. Is that right? If your answer is no then you are having the potentiality of thinking out of the box.

Can we think of it to be a mountain drawn in a different way? Or a hat? Or an ice cream cone? Or?? Are you willing to share what you thought about the picture? Innovative problem solving is "*thinking out of the box"*.

Nobody is a born innovative thinker.

Develop your thinking skills. Compare and improve.

*"Innovation is the ability to see change as an opportunity, not a threat." - Steve Jobs, co-founder of Apple Inc.*

Machine Learning – A Different way of Programming

SUMANA ADAK

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About Machine Learning:

Machine learning, a technology that is transforming many industries and changing the way we interact with technology. Machine learning is a subset of artificial intelligence that allows computers to learn from data and improve their performance over time. The field of machine learning has been around for several decades, but recent advances in computing power, data storage, and algorithms have enabled significant progress in the past few years. Machine learning, a technology that is transforming many industries and changing the way we interact with technology.
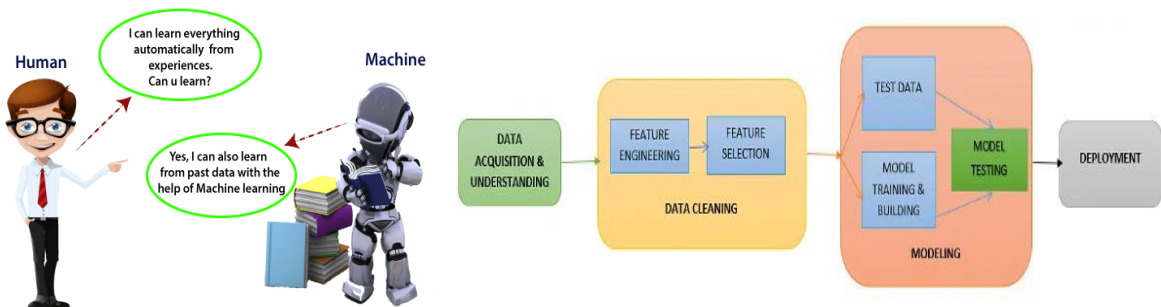
To work with machine learning in technical fields, you typically need to follow these steps:

Define the problem: The first step is to define the problem you want to solve. This involves understanding the data you have and the question you want to answer.

Collect and preprocess the data: The quality and quantity of data are crucial to the success of a machine learning project. You need to collect data that is relevant to your problem and preprocess it by cleaning, formatting, and transforming it. For data Kaggle is a good website.

Choose a model: There are many different types of machine learning models, each suited for different types of problems. You need to choose a model that is appropriate for your problem and dataset.

Train the model: To train a machine learning model, you need to feed it with labeled data and adjust its parameters to minimize the error between the predicted and actual outcomes.

Evaluate the model: Once you have trained the model, you need to evaluate its performance on a test dataset. This helps you determine if the model is accurate and if it is generalizable to new data.

- ✓ Linear models: These models assume a linear relationship between the input features and the output variable.
- ✓ Decision trees: These models use a tree-like structure to make decisions based on the input features.
- ✓ Neural networks: These models are inspired by the structure of the human brain and use layers of interconnected nodes to learn complex patterns in the data.
- ✓ Support vector machines: These models find the optimal boundary between different classes of data.
- ✓ Clustering models: These models group similar data points together based on their features.

Deploy the model: After the model has been evaluated and is deemed accurate, you can deploy it to automate tasks, make predictions, or solve problems.

Overall, machine learning is a powerful tool that can help technical fields solve complex problems and improve their efficiency. However, it requires careful planning, data management, and expertise in machine learning techniques to be successful.

Benefits of Machine Learning:

One of the key advantages of machine learning is its ability to analyze large amounts of data and identify patterns that may not be apparent to human observers. This has enabled significant improvements in fields such as healthcare, finance, transportation, and entertainment.

- ✓ In the healthcare industry, machine learning is being used to analyze medical records and images to improve diagnosis and treatment of diseases. For example, machine learning algorithms can be trained to identify cancerous

cells in medical images, allowing doctors to make more accurate diagnoses and develop more effective treatment plans.

✓ In the finance industry, machine learning is being used to improve fraud detection, risk management, and investment decisions. Machine learning algorithms can analyze vast amounts of financial data to identify patterns and anomalies that may indicate fraudulent activity or market trends.

✓ In the transportation industry, machine learning is being used to develop self-driving cars and optimize traffic flow. Machine learning algorithms can analyze traffic patterns and make real-time adjustments to traffic lights and other infrastructure to reduce congestion and improve safety.

✓ In the entertainment industry, machine learning is being used to personalize content recommendations and improve user experiences. Machine learning algorithms can analyze user behavior and preferences to suggest content that is more likely to be of interest to them.

Some Note about Machine Learning:

While the potential benefits of machine learning are vast, there are also significant challenges and ethical considerations to be addressed. One of the key challenges is ensuring that machine learning algorithms are accurate, reliable, and transparent. This is particularly important in fields such as healthcare and finance, where incorrect decisions can have significant consequences.

Another challenge is ensuring that machine learning algorithms are not biased or discriminatory. Machine learning algorithms are only as good as the data they are trained on, and if that data is biased, the algorithm will be biased as well. This has important implications for fields such as law enforcement, where biased algorithms can lead to unfair outcomes.

Privacy and security are also important considerations in the development of machine learning algorithms. Machine learning algorithms often require access to large amounts of sensitive data, and there is a risk that this data could be compromised or misused. This has important implications for fields such as healthcare, where patient data must be protected at all times.

Despite these challenges, there is no doubt that machine learning has the potential to transform many aspects of society in the coming years. In the healthcare industry, machine learning is expected to improve diagnosis and treatment of diseases, and enable more personalized medicine. In the finance industry, machine learning is expected to improve risk management and investment decisions, and reduce fraud. In the transportation industry, machine learning is expected to enable safer and more efficient transportation systems, and reduce traffic congestion.

Conclusion:

In conclusion, machine learning is a powerful technology that has the potential to transform many industries and improve our lives in countless ways. However, it is important to ensure that this technology is developed and used responsibly, with a focus on accuracy, transparency, and ethical considerations. By doing so, we can unlock the full potential of machine learning and create a brighter future for all.

"Machine learning is a core, transformative way by which we're rethinking everything we're doing." - Jeff Bezos, CEO of Amazon.
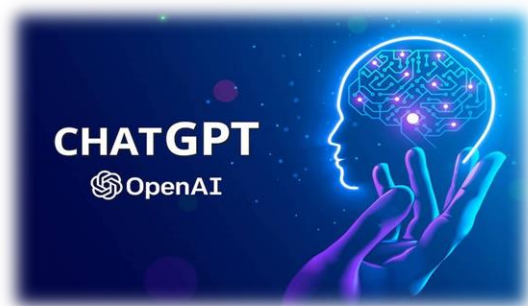
ChatGPT and AI Tools

MALAY MRIDHA
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Introduction:

The field of Artificial Intelligence has made tremendous strides in recent years, with a focus on the development of generative AI models. These models can be used to create human like responses to various queries or create new content on their own. ChatGPT is one such example of a generative AI tool that has been gaining significant popularity due to its ability to generate natural language text.

In this article, we will explore the world of ChatGPT and other generative AI tools. We will look at their applications, how they work, and the challenges associated with them. We will also discuss the potential impact that these tools can have on the future of various industries.

What is ChatGPT?

ChatGPT is a generative AI tool developed by OpenAI that is designed to create human-like text in response to various queries. The tool is based on the GPT (Generative Pre-trained Transformer) architecture, which uses a neural network to generate text that is similar to natural language.

ChatGPT is a language model that has been pre-trained on a vast amount of data from the internet. The model has been trained to generate text in various languages and can be finetuned for specific tasks such as answering questions or creating content.

One of the significant advantages of ChatGPT is its ability to generate text that is coherent and fluent. The tool can create responses that are similar to how a human would respond to a particular query, making it an excellent tool for chatbots and other conversational AI applications.

Applications of ChatGPT:

ChatGPT has several applications in various industries. Here are some of the ways it is being used:

1. **Chatbots** - ChatGPT is an excellent tool for creating chatbots that can respond to customer queries. The tool can generate responses that are similar to how a human would respond, making it an effective tool for customer service.

2. **Content Creation** - ChatGPT can be used to generate content for websites and social media platforms. The tool can generate articles, blogs, and social media posts that are similar to how a human would write them.

3. **Language Translation** - ChatGPT can be used for language translation. The tool can generate text in different languages, making it an effective tool for language translation.

4. **Personal Assistants** - ChatGPT can be used to create personal assistants that can help with scheduling, reminders, and other tasks.

5. **Customer service** - ChatGPT can be used to provide customer support through chatbots, reducing the need for human intervention and increasing efficiency.

6. **Gaming** - ChatGPT can be used in the gaming industry to generate in-game dialogue and narratives, enhancing the player experience.

7. **Education** - ChatGPT can be used to generate educational content, such as quizzes and study materials.

8. **Research** - ChatGPT can be used in research to generate text for literature reviews or summaries, saving time and effort for researchers.

9. **Creative writing** - ChatGPT can be used as a writing assistant for creative writing projects, generating prompts and suggestions.

10. **Voice assistants** - ChatGPT can be used in voice assistants to provide natural language responses to voice commands.

11. **Legal and financial services** - ChatGPT can be used in the legal and financial industries to generate contracts and other legal documents, as well as financial reports and analysis.

How does ChatGPT work?

ChatGPT is a type of generative language model based on a neural network architecture called the transformer. Here's a brief overview of how ChatGPT works:

1. **Training:** ChatGPT is trained on a large corpus of text data, such as books, articles, and websites. During training, the model learns to predict the next word in a sequence of words based on the words that came before it.

2. **Encoding:** To generate text, ChatGPT first encodes the input text using a process
called tokenization. Tokenization breaks the text into individual words or sub words, which are represented as numerical vectors.

3. **Contextualization:** ChatGPT then uses the encoded input text to generate a probability distribution over the next word in the sequence. This distribution is based not only on the input text but also on the model's internal state, which represents its understanding of the context of the text.

4. **Sampling:** Finally, ChatGPT uses a sampling algorithm to select the next word in the sequence based on the probability distribution. The sampling algorithm introduces some randomness into the selection process, which makes the output text less predictable and more diverse.

Through this process, ChatGPT can generate text that is similar in style and content to the text it was trained on. The larger and more diverse the training corpus, the better ChatGPT is able to generate high-quality text.

Other Generative AI Tools:

In addition to ChatGPT, there are many other generative AI tools that are used in a variety of applications. Here are some examples:

1. **StyleGAN:** StyleGAN is a generative adversarial network (GAN) that is used to generate high-quality images. It can be used in applications such as fashion design, advertising, and video game development.

2. **VQ-VAE:** VQ-VAE is a deep learning model that is used to generate high-quality images and videos. It can be used in applications such as video editing, virtual reality, and animation.

3. **PixelRNN:** PixelRNN is a generative model that is used to generate images pixel by pixel. It can be used in applications such as image editing, video game development, and virtual reality.

4. **OpenAI DALL-E:** DALL-E is a language model that can generate images from textual descriptions. It has applications in the fields of art, design, and advertising.

5. **DeepDream:** DeepDream is a generative model that creates psychedelic and surreal images by enhancing patterns in existing images. It can be used in applications such as art, design, and photography.

6. **Text-to-Speech Synthesis:** Text-to-speech synthesis tools use AI to generate human like speech from text. These tools have applications in the fields of education, entertainment, and accessibility.

7. **DeepPose:** DeepPose is a generative model that is used to generate 3D models of human poses. It has applications in the fields of animation, gaming, and virtual reality.

8. **Neural Style Transfer:** Neural style transfer is a technique that uses deep learning to apply the style of one image to another image. It has applications in the fields of art, design, and photography.

These are just a few examples of the many generative AI tools that are available today. As the field of AI continues to evolve, we can expect to see many more innovative and useful applications of these tools in a wide range of industries.

Challenges associated with AI Tools:

While AI tools have the potential to revolutionize many aspects of our lives, there are also several challenges associated with their development and use. Here are some of the key challenges:

1. **Bias:** One of the biggest challenges associated with AI tools is the risk of bias. AI algorithms are only as good as the data they are trained on, and if the data contains biases, the resulting AI models can also be biased. This can lead to unfair and discriminatory outcomes in areas such as hiring, lending, and law enforcement.

2. **Explainability:** Another challenge is the lack of explain ability of many AI models. Deep learning models such as ChatGPT and other generative AI tools are often described as "black boxes" because it can be difficult to understand how they arrived at their outputs. This can make it challenging to identify and address errors or biases in the model.

3. **Data privacy:** The use of AI tools often requires large amounts of data, which can raise concerns about data privacy. If sensitive personal or business data is used to train AI models, there is a risk that this data could be compromised or misused.

4. **Regulation:** As AI tools become more widespread, there is a growing need for

regulation to ensure that they are developed and used in an ethical and responsible way. However, there is currently a lack of consensus on how to regulate AI, which can lead to confusion and uncertainty.

5. **Technical complexity:** Developing and deploying AI tools can be highly technical and complex, requiring specialized expertise and infrastructure. This can make it challenging for smaller businesses or organizations to adopt and use AI tools effectively.

These are just a few of the challenges associated with AI tools. As the field of AI continues to evolve, it will be important to address these challenges in order to ensure that AI is developed and used in a responsible and ethical way.

Future of AI Tools:

The future of AI is a topic of much debate and speculation, with many different viewpoints and predictions. Some experts believe that AI will continue to advance at an exponential rate, leading to a world where AI is integrated into every aspect of our lives, while others believe that there are significant risks and challenges associated with AI that must be addressed in order to avoid negative consequences.

One thing is clear, however: AI is likely to play an increasingly important role in many different fields and industries. From healthcare and education to finance and

transportation, AI has the potential to transform the way we live, work, and interact with the world around us.

In the future, we may see AI tools that are even more sophisticated and powerful than what we have today. This could include tools that can reason, learn, and adapt in real-time, making them more versatile and useful in a variety of different applications.

However, there are also significant risks associated with the development and use of AI, including the potential for bias, privacy concerns, and ethical dilemmas. In order to fully realize the potential of AI, it will be important to address these challenges and ensure that AI is developed and used in a responsible and ethical way.

Ultimately, the future of AI will be shaped by the decisions and actions of those who develop and deploy these technologies. By working together to address the challenges and risks associated with AI, we can create a future where AI helps us to achieve our goals and solve some of the world's most pressing problems.

Conclusion:

In conclusion, AI tools such as ChatGPT and other generative AI models have the potential to revolutionize many aspects of our lives, from entertainment

and communication to healthcare and education. These tools are becoming increasingly sophisticated and powerful, and are likely to play an even more important role in the future.

However, there are also significant challenges associated with the development and use of AI, including the risk of bias, lack of explain ability, data privacy concerns, regulation, and technical complexity. It will be important to address these challenges in order to ensure that AI is developed and used in a responsible and ethical way.

Overall, the future of AI is both exciting and uncertain, and will depend on the decisions and actions of those who develop and use these technologies. By working together to address the challenges and risks associated with AI, we can create a future where AI helps us to achieve our goals and solve some of the world's most pressing problems.

"GPT-3, the most recent version of the GPT series, has 175 billion parameters, making it one of the largest language models in existence"

The Ultimate Guide to Starting a Successful Blog

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Introduction:

Blogging has become an incredibly popular way for individuals to express themselves, share their thoughts and opinions, and even make a living. With so many successful bloggers out there, it's easy to see why so many people are interested in starting their own blogs. However, getting started can be a daunting task, especially if you're new to the world of blogging.

In this article, we'll walk you through everything you need to know to start your own successful blog, including how to choose a niche, how to create content that resonates with your audience, and how to promote your blog to increase your reach and engagement.

Choosing Your Niche:

The first step in starting a successful blog is choosing a niche. A niche is a specific area of interest that your blog will focus on. Choosing the right niche is important because it will help you target a specific audience and stand out in a crowded market.

Here are some tips for choosing your niche:

- Choose something you're passionate about: Blogging requires a lot of time and effort, so it's important to choose a niche that you're truly interested in. This will make it easier for you to create content and stay motivated.

- Look for gaps in the market: Try to find a niche that isn't already saturated with content. This will make it easier for you to stand out and establish yourself as an authority in your niche.

- Consider your audience: Think about who your target audience will be and choose a niche that will appeal to them. This will help you create content that resonates with your readers and keeps them coming back for more.

Make Your Blog Website:

When it comes to creating a website or blog, there are several platforms to choose from. Two popular options are Blogger and WordPress. Let's take a look at the features of each platform and how to get started.

Blogger:

Blogger is a free platform owned by Google that allows you to create a blog without any hosting or domain fees. Here's how to get started:

1. Go to the Blogger website and sign in with your Google account.
2. Choose a name for your blog and select a template.
3. Customize your blog by adding pages, changing the layout, and adding widgets.
4. Start creating your blog posts by clicking on the "New Post" button.
5. Publish your blog post and share it with your audience.

While Blogger is free to use, it does have some limitations. For example, you won't have full control over your website's design and functionality. Additionally, your website will have a blogspot.com domain instead of a custom domain, which may look less professional.

WordPress:

WordPress is a popular platform that powers over 40% of all websites on the internet. It offers a lot of customization options and full control over your website's design and functionality. Here's how to get started:

1. Sign up for web hosting and purchase a domain name.

2. Install WordPress on your web hosting account.

3. Choose a theme for your website and customize it.

4. Install plugins to add functionality to your website.

5. Start creating your website content by creating pages and posts.

While WordPress does require hosting and domain fees, it offers a lot of flexibility and control over your website. Additionally, you can easily monetize your WordPress website using various strategies like advertising, affiliate marketing, and selling digital products.

Write Your Blog Post:

Once you've chosen your niche and make your website, it's time to start creating content. Creating compelling content is essential for attracting and retaining readers. Here are some tips for creating content that resonates with your audience:

- ✓ **Focus on quality over quantity:** It's better to create fewer high-quality posts than lots of mediocre ones. This will help you establish yourself as an authority in your niche and build trust with your readers.
- ✓ **Use a conversational tone:** Write as if you're having a conversation with your readers. This will help make your content more engaging and relatable.
- ✓ **Incorporate multimedia:** Use images, videos, and other multimedia to make your content more visually appealing and engaging.
- ✓ **Be original:** Try to come up with unique ideas and perspectives that haven't been covered extensively in your niche.
- ✓ **Use headlines and subheadings:** Use headlines and subheadings to break up your content and make it easier to read.

Promoting Your Blog:

Once you've created compelling content, it's time to start promoting your blog. Promoting your blog is essential for increasing your reach and engagement. Here are some tips for promoting your blog:

- ✓ **Use social media:** Share your blog posts on social media to reach a wider audience. Consider using platforms like Twitter, Facebook, and Instagram.

- ✓ **Guest post:** Reach out to other bloggers in your niche and offer to write a guest post for their blog. This will help you reach a wider audience and establish yourself as an authority in your niche.

- ✓ **Participate in online communities:** Join online communities related to your niche and participate in discussions. This will help you establish relationships with other bloggers and promote your blog.

- ✓ **Use email marketing:** Collect email addresses from your readers and send them regular newsletters or updates about your blog.

- ✓ **Use SEO:** Use search engine optimization (SEO) techniques to improve your blog's visibility in search engine results.

SEO for Your Blog:

SEO is essential for increasing your blog's visibility in search engine results. Here are some tips for optimizing your blog for search engines:

- ✓ **Use relevant keywords:** Use relevant keywords in your blog post titles, headings, and throughout your content. This will help search engines understand what your blog is about and rank it accordingly.

- ✓ **Use meta descriptions:** Use meta descriptions to provide a brief summary of your blog post. This will help search engines and readers understand what your post is about.

- ✓ **Use alt tags:** Use alt tags to describe images on your blog. This will help search engines understand what the images are about and improve your blog's visibility in image search results.

- ✓ **Use internal links:** Use internal links to link to other relevant posts on your blog. This will help search engines understand the structure of your blog and improve the user experience for your readers.

- ✓ **Use external links:** Use external links to link to high-quality sources that are relevant to your content. This will help establish your blog as a reliable source of information and improve your search engine rankings.

Monetizing Your Blog:

If you're interested in making money from your blog, there are several ways to monetize it. Here are some popular monetization strategies:

- ✓ Advertising: Display ads on your blog to generate revenue. You can use platforms like Google AdSense to display ads on your blog.

- ✓ Affiliate marketing: Promote products or services on your blog and earn a commission on any sales made through your unique affiliate link.

- ✓ Sponsored content: Work with brands to create sponsored content that promotes their products or services.

- ✓ Digital products: Create and sell digital products like eBooks, courses, or printable on your blog.

Conclusion:

Starting a successful blog takes time and effort, but it can be a rewarding and fulfilling experience. By choosing the right niche, creating compelling content, promoting your blog, and monetizing it, you can turn your blog into a successful online business. Remember to stay patient, stay consistent, and always prioritize your readers' needs and interests. Happy blogging

"According to SEMrush, the most common blog post format is "how-to" posts, which make up 38% of all blog posts."

E-GOVERNANCE – BETTER GOVERNMENT OR BITTER GOVERNANCE?

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E It is not an alien fact that covid-19 took over the world like a storm, even faster than the denims or K-Pop! There was no country, society or community which was left untouched by the pandemic, and which did not evolve to fit into a digital structure. Our governments were no exception. To overcome the obstacle of not being able to step out of our houses, the screens became our window to interact and carry out our lives as normally as possible. The government offices, structures and processes also took a similar stance, and many portals, websites and apps were launched to carry out tasks from Aadhaar verification to vaccination. Some countries like the USA even conducted their elections through online forums and contactless polls. Such a way of going on with government official activities through digital means is e-governance. In formal and descriptive terms, E-Governance is defined as a way to provide and facilitate government services, communication and information through Information and Communication Technology (ICT). Electronic governance or e-governance implies government functioning with the application of ICT (Information and Communications Technology). Hence e-Governance is basically a move towards SMART governance implying simple, moral, accountable, responsive and transparent governance.

Now the question arises: why do we need a way to organize the government into a digital structure? Imagine collecting and maintaining the data of billions of people in the form of physical files. The picture that comes into our mind is of long aisles of dusty and dirty shelves filled with files.

Yes, it might not be so but for even a small government organization, the database is huge, and every piece of information is equally vital. Now, if this information is stored in proper software, then it reduces time and effort as well as

prevents data redundancy, duplicity of data and saves storage space. Same goes with forms, applications, and submissions. The physical copy trend has been going on since long and is very vital, but it also poses the same problems. Formulating online forums, platforms, channels, and websites to access the required information, get the relevant process started, verify whatever information was provided and then giving the provided result within the span of two weeks automatically reduces half the burden of the officials and reverts the human resource to more useful tasks. It also automatically enters the new data in relevant places and keeps records up to date. In India, online vaccination, online Aadhaar verification, passport application etc. are excellent examples of E-Governance which have worked successfully till now. E-governance, therefore, surely makes the system a bit more efficient and smooth sailing.
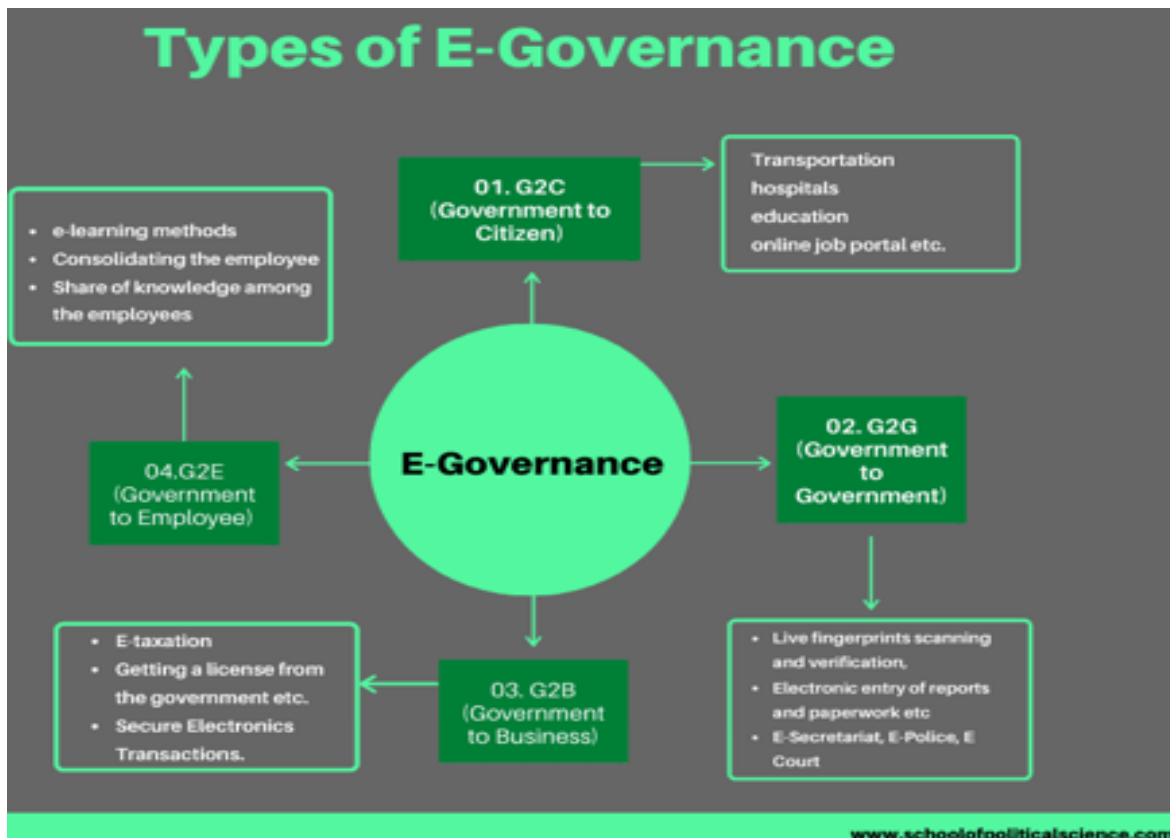
However, it does put doubts in many a head regarding the safety of their private information and their security. Governments are already the target of many hackers and haters with varying interest and the large amount of data makes it even more tempting to access it. Data theft is a serious risk with e-governance and is one of the major concerns, other than that a corrupted official could do as much harm by leaking or selling the information, a trade for which they will be highly paid for

and be lavishly compensated. This data could consist of bank details, social security details and much more. It could be exploited by foreign governments or fraudulent firms for their own evil intentions which could pose a threat to the national integrity of a nation. Data loss is also a very big threat that could lead to loss of money, time and effort. Doing it all over again is a task and there would be no one to blame or put the responsibility on.

Therefore, E-Governance is surely a revolution which increases efficiency and transparency of governments, yes there are a few threats, but governments are strong institutions which should be able to uphold their security and protect themselves from such threats. It is definitely an amazing and optimal way of governance that nations should adopt to practice better democracy and increase accountability.

Indian E governance Websites:

https://www.india.gov.in.

"If you think your users are idiots, only idiots will use it."— Linus Torvalds

HOW TO MAKE MONEY FROM YOUTUBE

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Earning from YouTube is the best and genuine source for online earning. YouTube is a platform to find movies, watch music videos, etc. but some groups of people, however, look at YouTube as a major income source for their online business. If you are a Student, Housewife or unemployed, you can generate massive income with a little effort on YouTube.

Creating a YouTube channel:

- Sign in to YouTube: If you already have a Google account, you can sign in with that. If you don't have a Google account, you'll need to create one.

- Create a channel: Once you're signed in, click on your profile icon at the top right corner of the screen. Then, click on "Create a Channel" from the dropdown menu.

- Choose a name for your channel: You can use your own name or come up with a creative name for your channel.

- Customize your channel: You can customize your channel by adding a profile picture and a banner image. You can also add a description of your channel and links to your social media accounts.

- Upload your first video: Once your channel is set up, you can start uploading videos. Click on the "Upload" button at the top right corner of the screen and select the video you want to upload.

- Optimize your videos for search: To make your videos discoverable, you'll need to optimize them for search. This includes adding titles, descriptions, tags, and thumbnails.

That's it! You're now ready to start creating and uploading videos to your YouTube channel.

In 2023 there are many YouTube channels that have larger no. of subscribers and they earn millions of dollars per year.

How to start Monetization on YouTube:

It is very easy and simple to monetize your channel. If you are a beginner and have no idea about monetization then follow these steps.

1. log in to your YouTube account.
2. In the channel setting tab, you have to allow the monetization option.
3. After enabling, follow the steps to accept the YouTube monetization agreement.
4. In the upload tab, you will see a green sign for the monetization. If your videos or channel is not eligible for the monetization then they will appear under the copyright notices.
5. Next, you will have to connect your AdSense account with your YouTube account. It is absolutely free to set up an AdSense account.
6. After all the process, your YouTube channel is now finally monetized.
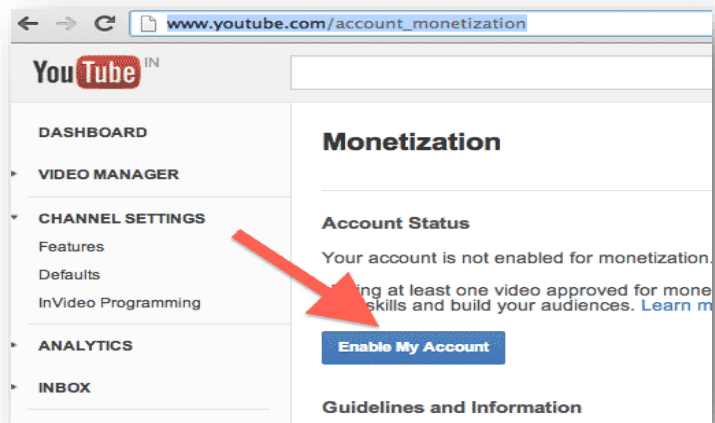
Criteria for monetization before starting the monetization, your channels must have at least 1,000 subscribers, you also need 4,000 hours of watch time. And an important thing you must have to always follow their Community Guidelines.

Join Partner Program YouTube:

The YouTube partner program is the best resource for YouTube creators. There are some benefits for joining the YouTube partner program, and the most

important thing is that Google manages it for you. That's why it is a safe and secure monetizing scope on YouTube.

Step to Join Partner Program:

1. Sign your account on YouTube
2. Click on the user name or profile picture on the upper right corner of the page.
3. select the "Monetization" option under the "Channel Settings" menu.
4. click on "Enable My Account."
5. A pop-up window with YouTube "Monetization Agreement" will appear on the screen
6. select the three checkboxes, click on "I Accept" button to continue
7. A pop-up window will appear next; this will be "Monetize my Videos." It will offer three options with check-boxes.
8. The options are:
    a. Overlay In-Video Ads
    b. True View In-Stream Ads
    c. Videos Contain a Product Placement
9. Click on "Monetize" button displayed in the lower right corner of "Monetize my Videos" menu to continue with the process.

LET'S TALK ABOUT DIFFERENT TYPES OF YOUTUBE VIDEOS CATEGORIES:

Film & Animation:

Film and Animation categories consist of two forms of categories. The first category is acknowledged as Film, and the second is considered as Animation. There are a lot of YouTuber in the world who make their own film and Animation videos and earn money. Not only big film they also can make short video and story.

Music

The music category supports music-related videos. Many people love to listen to songs so, if you have any kind of music video to upload or you are a musician, then you can always consider choosing this category. There are many who consider uploading music videos in the first category we have specified. Travel & Events Many people love to travel new country and tourism place or willing to know about it then they search their favorite areas so if you are a traveler this category is best for you and this also a best way where you travel and make video and earn money.

Gaming:

Gaming is a category that is in huge demand around the world as there are so many gamers that play online games and tournament in live and upload their videos it's a way where you easily play some game for an hour and upload their video on YouTube and earn money.

Education: In this category, education-purpose videos are uploaded. Many Student wants to study on YouTube So, if you are a teacher then you can teach online on YouTube.

Promotion:

Promotion is not a category, it is a technique to generate money.

If you have a large number of subscribers in your channel then many companies and some other YouTube channel which have a smaller number of subscribers will offered you to promote their channel and other things, it is depends on your category which you have selected.

"YouTube has paid out over $30 billion to creators, media companies, and music labels since it launched its advertising program in 2007.

APP DEVELOPMENT

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In the current digital era, we are all aware of the various kinds of applications, based, including Android apps, iOS apps, and many others. Applications can be desktop-mobile-based, or web-based. Desktop applications are installed on a user's computer and run locally, while mobile applications are installed on a user's Smartphone or tablet and can be downloaded from an app store. Web applications run on web browsers and can be accessed over the internet. In computing, an application, also known as an app, is a program or software designed to perform specific tasks or functions for the user. Applications can be used for a wide range of purposes, from productivity and entertainment to education and communication.

What is app development?

The process of producing software applications for usage on various platforms, such as computers, smartphones, tablets, and other electronic devices is known as app development or software development.

There are different types of app development, including:

1. **iOS app development**: Apple's mobile operating system is called iOS, and developing iOS apps entails making programmes that can only be used with iPhones and iPads. These apps are often created with the Xcode development environment and the Swift or Objective-C programming languages.

2. **Android app development**: Android app development entails making programmes that only work on Android smartphones and tablets because Android is Google's mobile operating system. The Android Studio development environment and the Java or Kotlin programming languages are frequently used to create these apps.

3. **Web app development**: Web apps run within a web browser and do not need to be downloaded or installed on a device. They are written using web technologies such as HTML, CSS, and JavaScript, and are accessible from any device with an internet connection. Web apps can be less powerful than native or hybrid apps, but they are often easier and faster to develop.

4. **MacOS app development:** The development of applications specifically for

Mac computers is known as "macOS app development." MacOS is Apple's desktop operating system. These apps are often created with the Xcode development environment and the Swift or Objective-C programming languages.

How to start learning Android app development?

Starting Android app development can seem daunting, but it is a rewarding and exciting process. Here are some basic steps to get started:

1. **Create a development environment:** The official integrated development environment (IDE) for Android app development, Android Studio, must be downloaded and installed. The entire toolkit for creating Android apps, including an emulator for testing them, is provided by Android Studio.

2. **Learn Java or Kotlin**: Android app development requires knowledge of programming languages such as Java or Kotlin. You can start by learning the basics of programming in general and then move on to learning Java or Kotlin. There are many resources available online, including online courses, tutorials, and books.

3. **Familiarize yourself with the Android SDK:** The materials and tools required for Android app development are offered through the Android Software Development Kit (SDK). To use the SDK in the development of your apps, become familiar with it, including the Android API documentation.

4. **Create your first app:** As you learn more about developing Android apps, start with a basic app and expand upon it. The templates that are provided by Android Studio for building simple apps can be a good place to start.

5. **Test and debug your app:** Use the Android emulator or a real Android smartphone to test and debug your app. You may identify and correct any issues or defects in your app with the use of Android Studio's debugging tools.

6. **Publish your app:** After testing and debugging it, you may upload your app to the Google Play Store. To publish your app, you must create a Google Play Developer account and follow the instructions.

Remember that Android app development is an ongoing process, and you will continue to learn and improve your skills as you work on more complex projects.

How to start learning iOS app development?

Even though learning iOS app development may seem scary, with the correct tools and strategy, it can be a fun and worthwhile adventure. Here are some fundamental actions to take:

1. **Purchase an Apple computer:** You'll need a macOS-running Apple computer to create iOS apps. You can purchase a Mac or use one in a library or computer lab.

2. **Download Xcode:** The official integrated development environment (IDE) for creating iOS apps is called Xcode. It is available for free download from the Mac App Store.

3. **Learn Swift:** Swift is the primary programming language used for iOS app development, therefore learn it. Swift can be learned through a variety of resources, including as tutorials, books, and online classes.

4. **Study iOS app development:** Once you have a good understanding of Swift, start learning iOS app development principles and practices. A smart place to start is with Apple's official documentation and resources. There are a tone of online lessons and courses accessible as well.

5. **Create your first app:** As you gain more knowledge, build upon a basic programme like a to-do list. You can use the basic app templates provided by Xcode as a starting point.

6. **Test and debug your app**: Use the Xcode simulator or a genuine iOS device

to test and debug your app. You can locate and correct any issues or bugs in your app with the help of Xcode's debugging tools.

7. **Publish your app:** Publish your app after testing and debugging it: Your app is ready to be published on the App Store. To publish your app, you must create an Apple Developer account and follow the instructions.

Remember that iOS app development is an ongoing process, and you will continue to learn and improve your skills as you work on more complex projects

How to start learning web app development?

Making web applications that can be used on any device having a web browser is known as web app development. Here are some fundamental actions to take before beginning web app development:

1. **Learn HTML, CSS, and JavaScript:** The structure of web pages is provided by HTML (Hypertext Markup Language), the appearance and layout are provided by CSS (Cascading Style Sheets), and the functionality is provided by JavaScript. You can learn these languages through a variety of internet resources, such as tutorials, books, and courses.

2. **Select a web app framework:** A web app framework offers a collection of tools and libraries to make the building of web apps simpler. React, Angular, and Vue.js are a few well-known web app frameworks. Select a framework based on your degree of expertise and the demands of your project.

Top 10 Web Application Frameworks

3. **Learn a server-side programming language:** Back-end functions like user authentication, data storage, and data processing are handled by server-side programming in web programmes. Languages used frequently for server-side

programming include PHP, Python and Node.js. Pick a language that works with the framework for your web application.

4. **Create your programming environment:** To create your code, you'll need a text editor or an integrated development environment (IDE). To test your web application, you will also want a local development server.

5. **Make your first web application:** Start with a straightforward web application, like a blog or to-do list, then expand upon it as you gain more knowledge. To learn new methods and ideas, refer to tutorials and internet resources.

6. **Test and debug your web app:** Use browser developer tools to test and troubleshoot your web application. You may also test your web application using online tools for various devices and browsers.

7. **Deploy your web app:** Your web app can now be deployed on a web server after it has been tested and fixed. Your online application can be hosted by a variety of web hosting services.

Remember that web app development is an ongoing process, and you will continue to learn and improve your skills as you work on more complex projects.

Career opportunities in App Development:

There are many career opportunities in App Development, including:

1. **Mobile app developer:** Designing, creating, and maintaining mobile apps for iOS, Android, or other mobile platforms are the responsibilities of mobile app developers. They are in charge of developing the code, testing the apps, and making sure that they are user-friendly and satisfy the demands of the customers.

2. **UX/UI designer:** Designing the user interface and user experience of mobile apps is the responsibility of a UX/UI designer. They collaborate closely with programmers to make sure the design is both practical and aesthetically pleasing.

3. **Product manager:** Product managers supervise the creation of mobile apps from conception to distribution. They are in charge of overseeing the product strategy, working with cross-functional teams, and making sure the app

satisfies user requirements.

4. **Project managers:** Project managers are responsible for managing the entire mobile app development process. They are in charge of working with cross-functional teams, controlling spending and deadlines, and guaranteeing that the software satisfies client needs.

5. **Technical writers:** Technical writers produce user guides, help files, and release notes for mobile apps. They collaborate closely with programmers to comprehend the operation of the app and provide lucid, understandable documentation.

Conclusion:

In conclusion, the sector of app development is expanding quickly and provides a variety of job prospects. There is a place for you in the app development market, regardless of your interests in user documentation creation, managing the development process, or designing and producing mobile apps. You can pursue a fulfilling career in app development and contribute to the development of ground-breaking ideas that enhance people's lives with the correct knowledge and training.

"There's an app for that" has become more than a catchphrase, it's become a way of life."

- Marissa Mayer,Ex ceo of yahoo

Video Editing Software and Filters

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Video editing is the manipulation and arrangement of video shots. Video editing is used to structure and present all video information, including films, television shows, video advertisements etc. Video editing has been dramatically democratized in recent years by editing software available for personal computers. Editing video can be difficult and laborious, so several technologies have been produced to aid people in this task. Pen based video editing software was developed in order to give people a more intuitive and fast way to edit video.

APPLICATIONS OF VIDEO EDITING:

Video editing can be used for many purposes such as education, entertainment, and documentation.

- **Virtual reality:** - Advancements are being made to help with editing spherical video used in virtual reality settings. The ability to edit in virtual reality was created so that users would be able to check their video edits in real time, without having to continually view the video in a headset between edits.

- **Social media**- Video editing can be used for entertainment and other purposes on YouTube and other social media sites. School/college/university teachers have used video editing to help their students retain information and extend lessons outside the classroom.

WHAT IS VIDEO EDITING SOFTWARE

Video editing software is any software program capable of editing, modifying, generating, or manipulating a video or movie file. It serves a lot of purposes, such as filmmaking, audio commentary, and general editing of video content.

In NLE (Non-linear Editing system) software, the user manipulates sections of video, images, and audio on a sequence. These clips can be trimmed, cut, and manipulated in many different ways. When editing is finished, the user exports the sequence as a video file.

Components

Timeline

A wipe is a common form of transition applied between two video clips

NLE software is typically based on a timeline interface where sections moving image video recordings, known as clips, are laid out in sequence and played back. The NLE offers a range of tools for trimming, splicing, cutting, and arranging clips across the timeline.

Another kind of clip is a text clip, used to add text to a video, such as title screens or movie credits. Audio clips can additionally be mixed together, such as mixing a soundtrack with multiple sound effects.

Typically, the timeline is divided into multiple rows on the y-axis for different clips playing simultaneously, whereas the x-axis represents the run time of the video.

Effects such as transitions can be performed on each clip, such as a crossfade effect going from one scene to another.

Exporting

Since video editors represent a project with a file format specific to the program, one needs to export the video file in order to publish it.

Once a project is complete, the editor can then export to movies in a variety of formats in a context that may range from broadcast tape formats to compressed video files for web publishing (such as on an online video platform or personal website), optical media, or saved to mobile devices.

To facilitate editing, source video typically has a higher resolution than the desired output. Therefore, higher resolution video needs to be downscaled during exporting, or after exporting in a process known as transsizing.

Visual effects

Chroma keying, commonly done with a green screen, allows a subject to appear composited against the background.

As digital video editing advanced, visual effects became possible, and is part of the standard toolkit, usually found in prosumer and professional grade software.

A common ability is to do compositing techniques such as chroma keying or luma keying, among others, which allow different objects to look as if they are in the same scene.

A different kind of visual effects is motion capture. Software such as Blender can perform motion capture to make animated objects follow an actor's movements.

Additional features

Most professional video editors are able to do color grading, which is to manipulate visual attributes of a video such as contrast to enhance output, and improve emotional impact. Some video editors include stock footage available for use.

TOP VIDEO EDITING SOFTWARE FEATURES

When looking for a video editing app, you'll want to make sure that it provides most of the following basic tools:

Trimming/Cutting Segments: Almost every piece of video software on the market gives you the option of cutting clips into smaller chunks. This feature also lets you remove footage you don't want. Trimming tools are needed to edit longer videos you shoot into short ones and are especially useful if you intend to share online.

Contrast Adjustment: Video clips are sometimes too dark or too bright. The contrast adjustment option lets you adjust the brightness and contrast levels to add visual definition to a scene. While it won't work miracles, a contrast adjuster can save footage you'd otherwise have to get rid of and re-shoot.

VFX/SFX: Visual and sound effects features are often included with higher-end video editing tools. While you might have played around with the simple filters that come with basic media software, professional video software usually comes with many HD effects that you can use in high-resolution projects.

Transitions: These are specialized effects that allow you to blend one scene into the next. Popularized by Hollywood directors, these features can lend a professional tone to your business presentations.

Audio Editing Modules: Business presentations usually feature some kind of narration. You might want to edit, or replace any sound you captured when shooting a video. Audio editing tools can handle both these tasks. You can also create your own sound effects if you don't want to use the ones that came with the program. Some programs allow you to reuse audio elements in different video projects too. Professional software sometimes includes modules that rival standalone sound recorder programs.

Rotator: If you've ever posted a video from your phone or digital camcorder, only to find you were holding it the wrong way, then you probably wished you had some way to rotate the footage. Most film editing software will let you flip frames around. The best packages give you the option of spinning a frame to neatly fit nearly any orientation.

Clip Joiner: Software that comes with a clip joiner gives you the option of attaching two or more clips together. This gives you more flexibility when it comes to choosing how to work with collections of shorter video files.

Clip Re-Sequencer: This option gives you the freedom to sort clips into any order you choose. You can import clips from other projects, or shoot new footage before adding it into an existing video. This feature is an important part of powerful NLE software packages.

EXAMPLES OF VIDEO EDITING SOFTWARE

- ✓ EaseUS Video Editor
- ✓ DaVinci Resolve
- ✓ HitFilm Express
- ✓ Lightworks
- ✓ Adobe Premiere Pro
- ✓ iMovie
- ✓ Shotcut
- ✓ Coral Video Studio Ultimate
- ✓ CyberLink Power Director
- ✓ Pinnacle Studio

Step by step process to create a video

First of all, you have to choose any of the video editing software (Ensure that the software has the top editing features).

Here 's an example of creating a small video using EaseUS Video Editor.

Step-1:

Import wanted media (video, image, audio, subtitle).
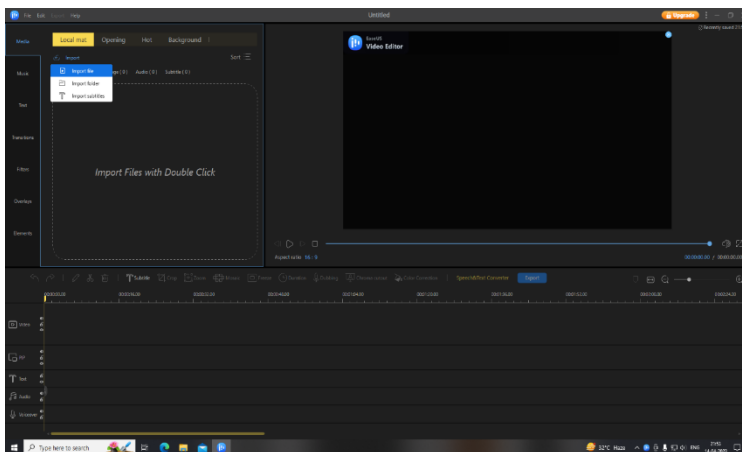
Step-2:

After importing the media file, you need to add the imported file to the track by choosing the "Add to Project" option, or you can drag and place the video to the track as you want.
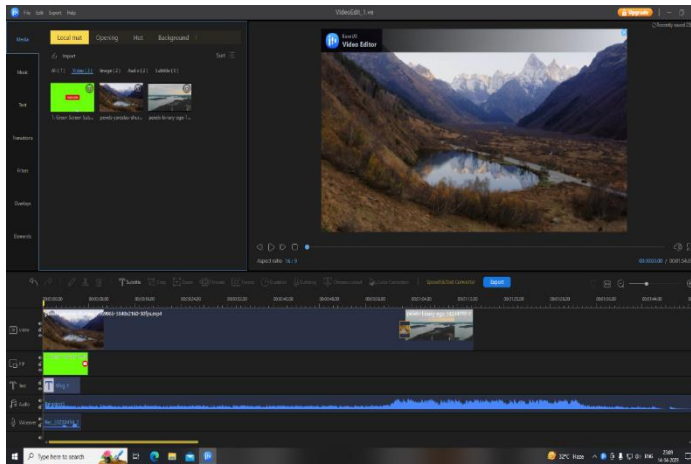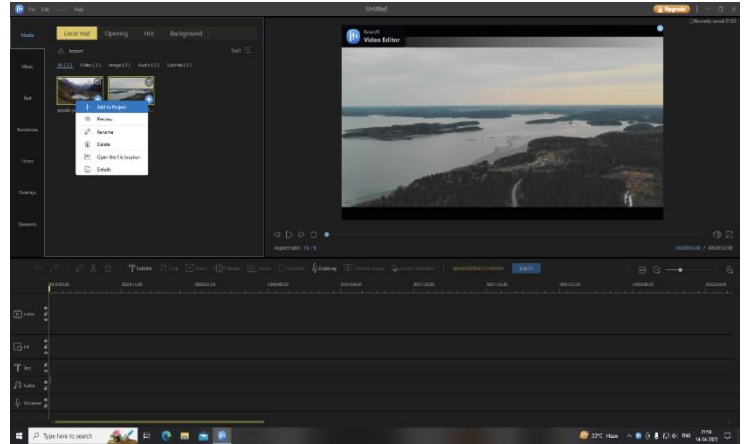
Step-3:

According to your need you can add music, text, transitions, filters, overlays, elements to your project. You can also add voiceovers by the "Dubbing" option in the toolbar.

Step-4:

Click "Export" in the Toolbar to export the video to the wanted format.
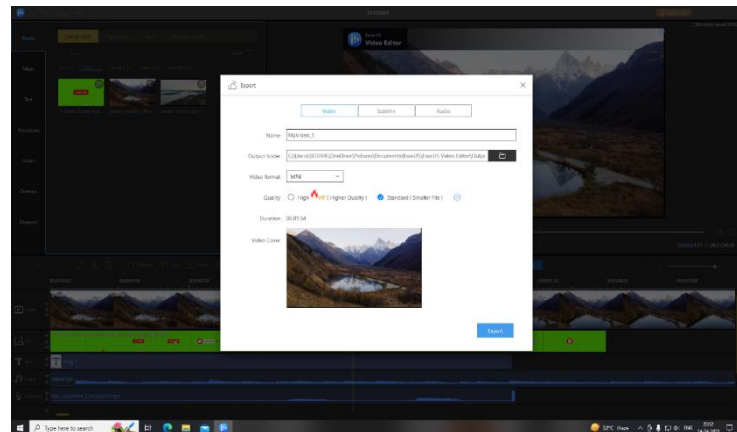
Filters

A video filter is a software component that performs some operation on a multimedia stream. Multiple filters can be used in a chain, known as a filter graph, in which each filter receives input from its upstream filter, processes the input and outputs the processed video to its downstream filter.

In traditional still and motion-picture photography, a filter was a specialized piece of glass affixed to the lens to alter (and hopefully improve) the image. Today, the term 'filter' more often refers to a small program or subroutine running inside an editing application. But, just like optical filters, electronic filters help you manage the look of your footage.

Types of filters

1. Anti-Shake Filter

If you aren't shooting with a gimbal or Steadicam to smooth out your shots, handheld footage might be a little shaky than what you were going for. Although handheld is definitely a valid style of filmmaking, you don't want it to be too distracting. If you find yourself working with footage that shakes about too much, try applying an anti-shake filter to stabilize it in post-production.

2. Auto Exposure Filter

Sometimes on set you might run into issues that you only notice when you get into the edit. Exposure is one of them, especially if you are shooting quickly. If you find your footage a little too dark or too bright, try applying an auto exposure filter to level out the brightness. It won't make it perfect, but it will certainly help, and you can refine it from there.

2. Auto Exposure Filter

Colour grading is an important part of the editing process, especially when the video has been shot raw. It lets you bring out the colors you want and really refine the picture. Color grading filters, like the Lumetri Color Panel in Premiere Pro, generally let you manipulate the individual hues such as highlights, mid-tones, and shadows. And you can explore some more cool color effects in this post, too.

4. RGB Curves

Stepping up to more advanced color correction, RGB Curves provide you with color graphs that you can use to fine-tune specific colors within an image. You can apply this filter to every clip in your film and refine them separately.

5. Tint

If you're not looking to go into such detail in every single clip, try applying a tint filter to tip the balance one way or the other. The color of your tint will depend on the results you're trying to achieve and the tone you want to convey in your film.

6. Auto Levels

If you're in a hurry or just aren't fussed about going into detailed color correction, an Auto Levels filter will adjust a range of settings for you based on what the software thinks is not quite right about the image.

7. Chroma Key

Applying green screen effects in your videos is easier than ever thanks to chroma key filters that let editors quickly key out colors in a shot and composite another image over the top.

8. Audio Filters

Filters and effects are not just limited to video footage, either. Apply them to audio files to enhance, repair or create a different style entirely. Effects and filters like EQ and reverb can really bring a film to life.

"The global video editing software market was valued at $743 million in 2020 and is expected to reach $1.8 billion by 2028

TIPS AND TRICKS ON MOBILE

JUHI MONDAL
Student, Semester: 2, Computer Science Dept.

Google's feature-rich mobile operating system is packed with many useful tools that lie just beneath the surface. Use our nearly two dozen tips to improve your Android experience.

But these are all handy little tips you can use to get more out of your mobile, and maybe raise an eyebrow or two along the way.

1.Configure Your Lock Screen

Android phones all offer various forms of secure lock screens. Most phones will prompt you to do this during setup now, and you should. The defaults are PIN, pattern, and password. Most devices now offer fingerprint security which will probably be the fastest way to unlock your device. Here is how to do it:

To control your lock screen, head to the system settings, and find the Security menu. Some phones have a separate lock screen menu instead.

You will need to have a secure lock screen to use features like Android Pay and factory reset protection.
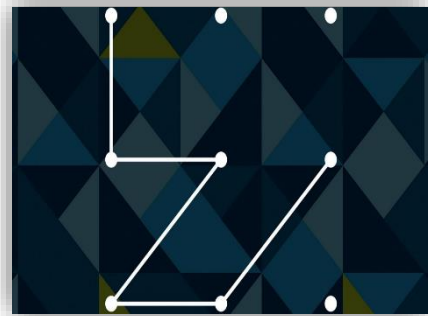
2.Disable/Uninstall Bloatware

Most phones come with some apps pre-installed that you won't want to keep around. Luckily, they can be dealt with these days. Some pre-installed bloat can be uninstalled normally by using the Play Store or finding it in the app settings menu. However, anything that's part of the system image is non-removable.

Here is how to do it:

What you can do is disable it by opening the app menu from the main system settings and finding the app in your list. Right at the top will be a "Disable" button that removes it from your app drawer and prevents it from running in the background.
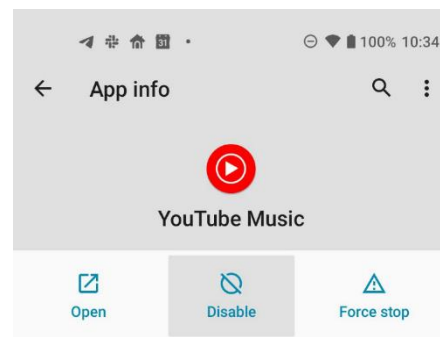
3."OK Google" Voice Match

Google search is at the heart of all Android phones, and you can start searching at any time just by saying "OK Google." This works on the home screen and in the search box automatically.
Here is how to do it:
the search settings, you can get OK Google working everywhere.

In the search settings, go to Voice > Voice Match.
 Just turn on the "Access with Voice Match" option and the phone will have you say "OK Google" a few times to learn your voice.
Now you can use the hot word any time the device is awake from any screen. Some devices also support this when the screen is off, while others only work when the device is awake.
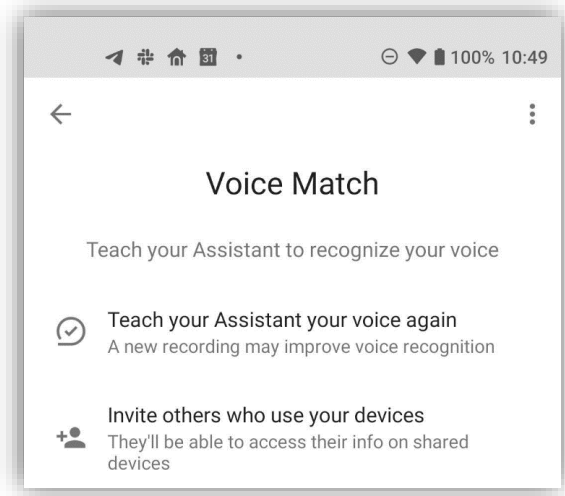
4.Clear App Defaults

It's annoying when a link opens in a certain app rather than in the browser. It could be a YouTube link, a tweet, or a Facebook page—you'll end up waiting around while your phone shuts down Chrome (or your browser of choice) and fires up something else.
Here is how to do it:
Go to Settings > Apps and notifications and find the app that keeps opening.
 Once there, tap on Advanced, scroll down to Open by default, press it, and then select Clear Defaults.

5.Turn on Notification History:

We've all swiped away notifications accidentally before. It's frustrating, especially if you didn't notice which app it came from. Android 11 and above have a solution in the form of the Notification History feature.
Here is how to do it:
It is easy to turn on. Just go to Settings > Apps and notifications > Notifications > Notification history and slide the toggle into the on position.
 Once enabled, tap History in the notification shade to see what you missed.
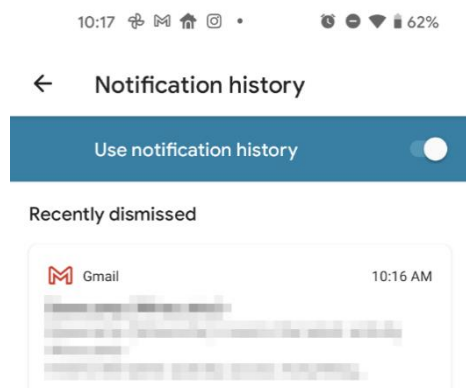
5.Floating Keyboard

Did you know that you can have a Keyboard that can float anywhere you want on the screen as per your convenience? You can even Resize the Keyboard and Change Color / Theme of the Keyboard.

For this you must have the Google Gboard Keyboard App installed and activated as the main input method.
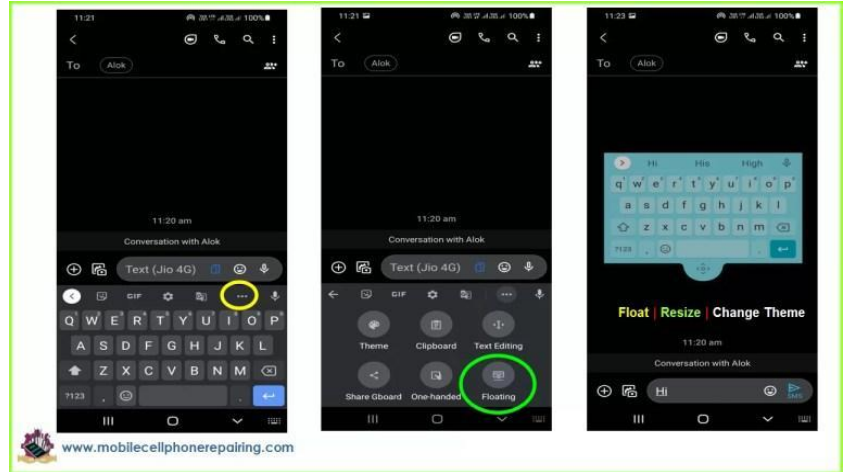
Here is how to do it:
Download and install Google Gboard Keyboard App and activate it as the main input method from setting.
Now open any App such as SMS or Whatsapp
Start a New Chat / SMS or Reply to an existing Chat
Bring the Cursor in the Typing Box
The Gboard Keyboard will appear
On the Keyboard at the top Right corner you will see the 3 dots. Press on the 3 Dots
Select "Floating".
Now you can easily float the Keyboard on the screen anywhere you want as per your own convenience.

6.Different Volume for Different Android Apps

Do you know that Android has in-built feature that lets you automatically adjust different volume for different Apps such as Ringtone, Media, Notification, System Sound, Alarm etc. depending on your preference?

Here is how to do it:
Press the Volume Up Key
Now Tap on the 3 Dots at the Top
Now you can adjust volume of Ringtone, Media, Notifications and System Settings.
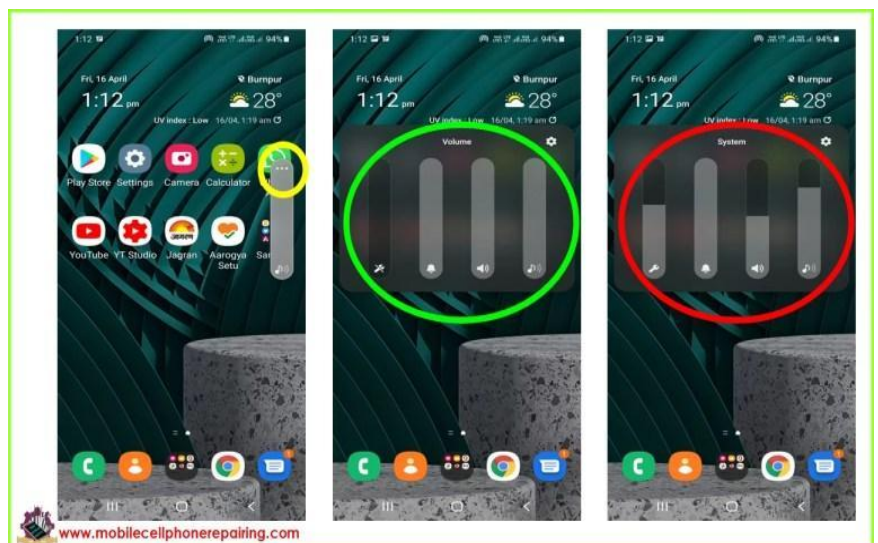
7.Double up the Charging speed

You have a slow charging android smartphone and are fed up with its slow charging, then here is the Trick. We all know that we can speed up the charging speed by simply switching off the phone.


But if you do now want to switch OFF the Phone and still want to Double the Charging Speed then Simple Pull down the Notification Bar and Put the Phone in Airplane Mode.

This one simple Trick will help to almost double up the Charging Speed even if you don't have a fast charger of even if your phone does not support fast charging.

8.Enable Chat Bubbles

All compatible messaging apps support chat bubbles. A chat bubble is a persistent shortcut icon that is always visible on-screen, regardless of whether you are using the main app or not. It will take you straight to the chat window of the person you are talking to.
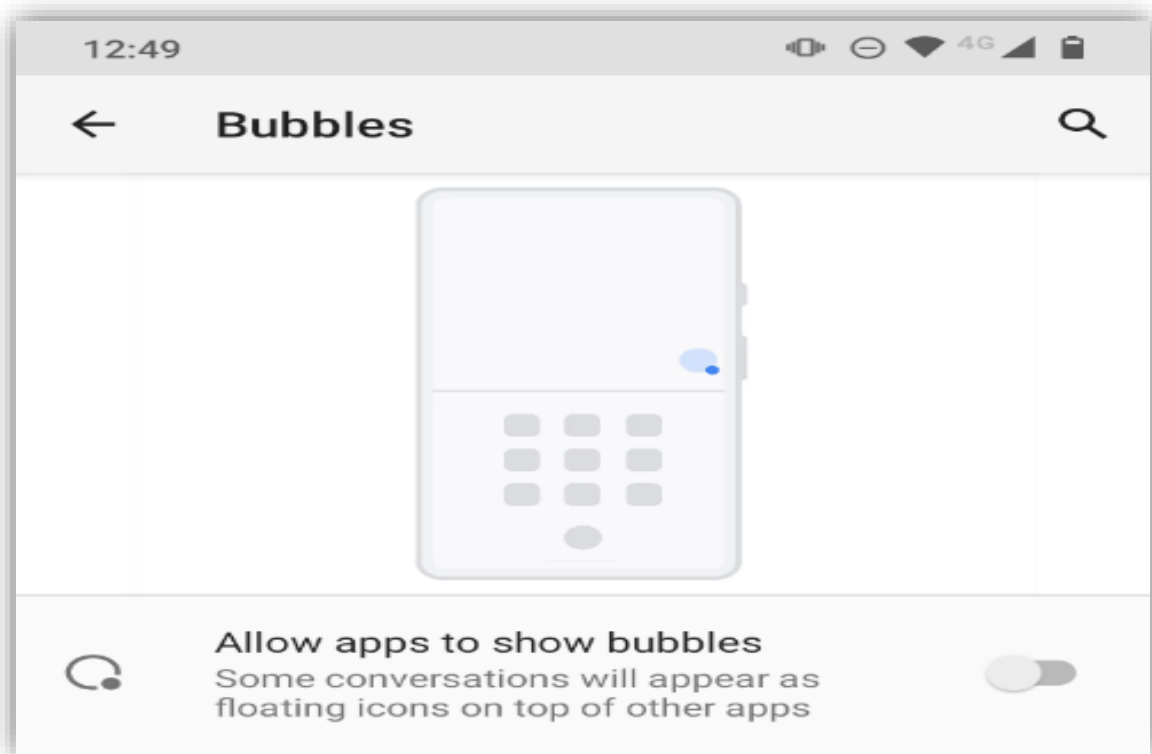
Here is how to do it:
You can turn chat bubbles on by heading to Settings > Apps and notifications > Notifications > Bubbles. Then turn any chat into a bubble by going to Settings > Apps and notifications > Conversations and choose the conversation you want to enable the feature for.

9.Add any WhatsApp Chat Shortcut to Home Screen

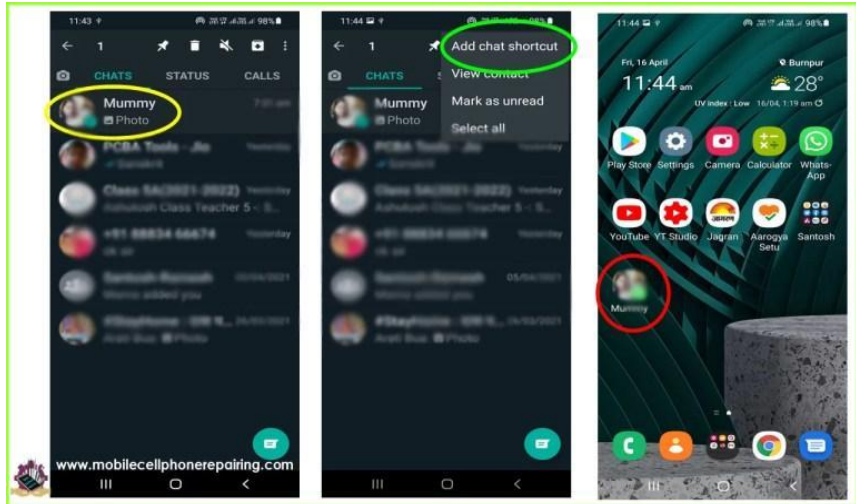You can easily add shortcut of any individual or group WhatsApp chat to home screen for easy access.

Here is how to do it:
Open WhatsApp
Long press any individual or Group chat.
On the Top Right Corner on 3 Dots, select "Add Chat Shortcut "

Now you can easily add shortcut of the chat to your home screen for quick and easy access.
This option is available in many other apps too.

10.Offline Google Maps

Having Offline Google Maps or Navigation Maps can be handy and useful during journey or at places where there are Internet Network Issues. To avoid any unwanted trouble, you can always download your desired Google Map or Maps and use them Offline whenever and wherever required.

Here is how to do it:
Open Google Maps App
Click on your Profile at the Top Right Corner
A menu will appear on the Left. Select "Offline Maps"
Now click on "Select Your Own Map"
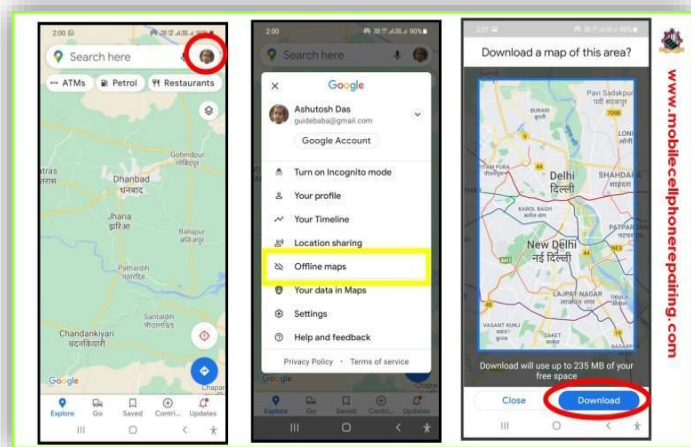
Select your Desired Map and click "Download". In few seconds your map will be downloaded for Offline Use.
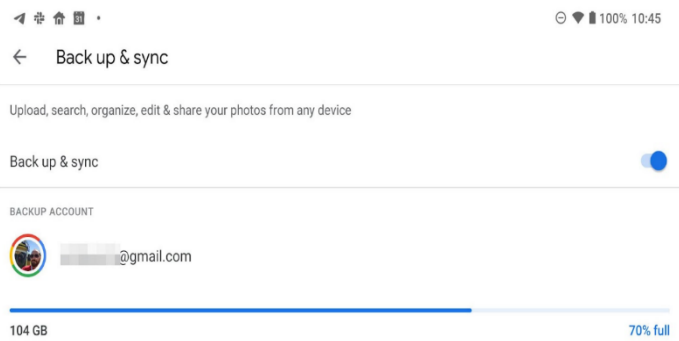
11.Make Sure Your Photos Back Up Automatically

There's nothing worse than losing or breaking a phone only to realize your photos aren't backed up.

Here is how to do it:
Simply opening the Google Photos app and following the prompts to enable auto-backup. The default mode is "high quality" and unlimited space. This compresses your photos, but they look surprisingly good.

12.Sideload (Safe) Apps

The Play Store has plenty of apps, but if you want to branch out a little, there are safe ways to do that.
Here is how to do it:
First, head into the security settings on your device and enable "Unknown Sources." That will let you install APKs downloaded from outside the Play Store.
Some of the popular ones are the Amazon Appstore, F-Droid, and APK Mirror.
Amazon offers a fair number of paid apps for free, and F-Droid is for free and open-source software.
APK Mirror re-hosts free APKs so you don't have to wait on staged rollouts and can get old versions of software.

13.Rotation Lock Button

Rotation lock can be a bit touchy, flipping the screen around when you tilt the phone just a little too far. In Android 9 Pie and later, you can change the rotation setting to lock it in portrait mode but still have access to landscape mode.
Here is how to do it:
Start by disabling auto-rotate in the settings.
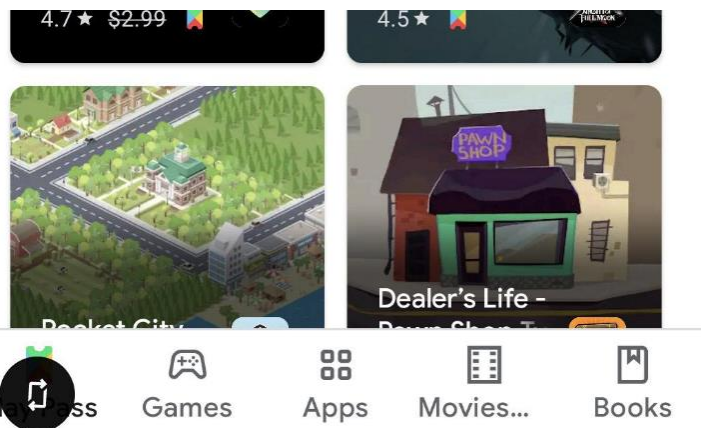
Then, look for the rotation button at the bottom of the screen the next time you turn the phone sideways.
Tap that, and it locks into landscape mode until you spin the phone back.
Tap the button again, and it's locked in portrait again.

14.Triple Tap to Zoom

This Android Phone Hacks and Tricks is very useful for people with poor eyesight.
You can just Triple Tap anywhere on the screen of your Android Smartphone or in any application to zoom out and zoom in.
Here is how to do it:

Go to Settings
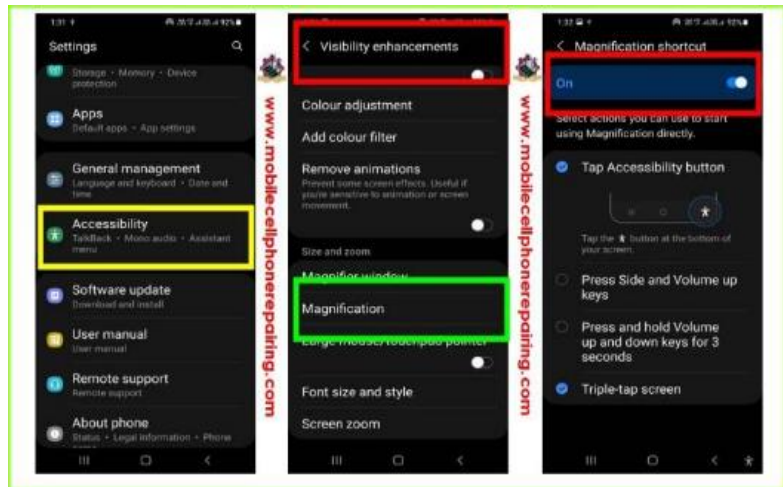Accessibility -> Visibility Enhancement ->
Magnification -> ON
Select Triple Tap to Zoom.
That's all.

And Much More...

After all of the above, you should be a pro at using Android. This is just the beginning, though. There's a lot more to discover in Android, and every device is a little different. So, don't be afraid to poke around in the deep, dark corners of the settings and see what you can find.

"Mobile apps are becoming the main access point for businesses to interact with their customers." - Brent Johnson

FUTURE OF AI

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The future of AI is both exciting and unpredictable. While the technology has advanced rapidly in recent years, there are still many challenges to overcome before AI can achieve its full potential. Here are some of the key trends and developments that are likely to shape the future of AI:

Continued growth and development:
AI will continue to grow and develop, with new breakthroughs and innovations that will transform the way we live and work.

Increased automation:
As AI becomes more advanced, it will become increasingly capable of automating a wide range of tasks, from basic administrative tasks to more complex decision-making processes.

Greater personalization:
AI will enable greater personalization of products and services, allowing businesses to better tailor their offerings to individual customers.

Improved healthcare:
AI has the potential to revolutionize healthcare, with applications in disease diagnosis, drug discovery, and personalized treatment.

Enhanced safety and security:
AI can be used to enhance safety and security in a variety of contexts, including cybersecurity, transportation, and emergency response.

Ethical and regulatory considerations:
As AI becomes more advanced, there will be growing ethical and regulatory considerations, particularly around issues such as privacy, bias, and accountability.

- ✓ First, we need to know what is Artificial Intelligence (AI).

- ✓ Artificial intelligence is a process where the human intelligence is process by computer system.

- ✓ Artificial intelligence is a rapidly advancing field that has the potential to revolutionize many industries and change the way we live and work.
- ✓ IT refers to the development of computer systems that can perform tasks that typically require human intelligence, such as understanding natural language, recognizing images, making decisions, and learning from experience

✓ AI systems can be designed to operate autonomously or in collaboration with humans, and they are increasingly used in a wide range of applications, from self-driving cars to personalized recommendations in online shopping.

Presently AI in everyday life: Market?

- **Online shopping and advertising:** Artificial intelligence is widely used to provide personalized recommendations to people, based for example on their previous searches and purchases or other online behavior. AI is hugely important in commerce: optimizing products, planning inventory, logistics etc.

- **Fighting disinformation:** Certain AI applications can detect fake news and disinformation by mining social media information, looking for words that are sensational or alarming and identifying which online sources are deemed authoritative.

- **Education:** AI is being used in education for personalized learning, intelligent tutoring, and automated grading.

- **Customer Service:** AI is being used in customer service for chatbots, voice assistants, and automated responses to frequently asked questions.

- **Cars:** While self-driving vehicles are not yet standard, cars already use AI-powered safety functions. Automated sensors that detect possible dangerous situations and accidents.

- **Digital voice assistants:** From getting directions to your lunch spot to inquiring about the weather for your weekend getaway, digital voice assistants are quickly becoming our can't-live-without co-pilots through life. These tools from Siri and Alexa to Google Home and Cortana, use natural language processing and generators driven by AI to return answers to you.

- **Web search:** Search engines learn from the vast input of data, provided by their users to provide relevant search results.

- **Artificial intelligence against Covid-19:** In the case of Covid-19, AI has been used in thermal imaging in airports and elsewhere. In medicine it can help recognize infection from computerized tomography lung scans. It has also been used to provide data to track the spread of the disease.

Overall, AI is being used in many industries to improve efficiency, productivity, and customer experience while also reducing costs and improving outcomes.

Types of AI

1. Software: virtual assistants, image analysis software, search engines, speech and face recognition systems

2. "Embodied" AI: robots, autonomous cars, drones, Internet of Things

Some of the futuristic AI work that researchers and scientists are exploring include:

- **Human-AI Collaboration:**

The future of AI involves humans working alongside intelligent machines. This collaboration involves machines performing tasks that complement human skills, such as cognitive reasoning, data processing, and pattern recognition.

- **Quantum Computing and AI:**

Quantum computing has the potential to significantly improve AI's processing power, making it possible to tackle more complex problems that are currently beyond our capabilities.

- **Explainable AI:**

Explainable AI refers to AI systems that can explain their decision-making processes and provide understandable and transparent results. This is important for building trust and accountability in AI systems.

The future of AI in transport.

1. **Autonomous Vehicles:**
 AI will play a crucial role in the development of autonomous vehicles, which have the potential to revolutionize transportation. These vehicles will rely on sophisticated algorithms and sensors to navigate roads, avoid obstacles, and interact with other vehicles.

2. **Traffic Management:**
 AI can help to optimize traffic flow and reduce congestion by analyzing data from sensors, cameras, and other sources. This can include predicting traffic patterns and rerouting vehicles to avoid congested areas.

3. **Personalized Transportation:**
AI can be used to create personalized transportation solutions based on individual preferences and needs. This can include personalized routes, schedules, and modes of transportation.

The future of AI in education.

- **Personalized Learning:**
 AI can be used to personalize learning by creating adaptive learning experiences that are tailored to individual students' needs, interests, and abilities. This can help to improve student engagement and learning outcomes.

- **Automated Grading:**
 AI can be used to automate grading, saving teachers time and enabling them to provide faster and more accurate feedback to students.

- **Virtual Classrooms:**
 AI can be used to create virtual classrooms, where students can interact with teachers and other students in real-time, regardless of their location.

- **Intelligent Tutoring:**

AI can be used to provide intelligent tutoring, where virtual tutors can interact with students and provide personalized feedback, support, and guidance.

The future of AI in military.
- **Cyber Defense:**

AI can be used to detect and respond to cyber threats, including identifying vulnerabilities in networks and systems, and developing and implementing security measures to protect against attacks.

- **Training and Simulation:**

AI can be used to provide realistic training and simulation environments for military personnel, enabling them to practice and refine their skills in a safe and controlled environment.

- **Autonomous Weapons:**

AI can be used to develop autonomous weapons, including drones and unmanned ground vehicles, which can operate in dangerous environments without risking human lives.

The future of AI in robotic science.
- **Collaborative Robotics:**

AI can be used to enable robots to work collaboratively with humans, sharing tasks and complementing human skills. This can lead to more efficient and effective work processes, as well as improved safety in hazardous environments.

- **Intelligent Robotics:**

AI can be used to develop intelligent robots that can perceive and interact with their environment, make decisions, and learn from experience. These robots can be used in a wide range of applications, from manufacturing to healthcare to space exploration.

- **Autonomous Robots:**

AI can be used to develop autonomous robots that can operate without human intervention. These robots can be used in a wide range of applications, including search and rescue, surveillance, and exploration.

Overall, AI is likely to play an increasingly important role in the future of military operations, enabling more efficient, effective, and precise use of military resources, future of robotics, enabling the development of more intelligent, autonomous, and collaborative robots that can perform a wide range of tasks in various industries future of education, enabling more personalized, efficient, and effective learning experiences for students and future of transport, bringing about significant improvements in safety, efficiency, and sustainability.

"The question of whether a computer can think is no more interesting than the question of whether a submarine can swim."

- Edsger W. Dijkstra, computer

TOP 10 GOOGLE CHROME EXTENSIONS

SAYAN DAS
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A Chrome extension is a small software program that is installed on the Google Chrome web browser. It is designed to add new features and functionalities to the browser or modify existing ones. After installation, they appear as icons on the browser toolbar, the user can click those icons for needed services. Extensions can access and modify the data on web pages that the user is currently viewing. Now we discuss some popular and useful Chrome extensions below.

Examples of the type of functionality that a Google Chrome extension can add to Chrome includes:

- Blocking ads from being displayed

- Optimizing memory usage so that Chrome runs more efficiently

- Adding to do lists or notes to Chrome

- Password management

- Making it easier to copy text from a site

- Protect your privacy and making web browsing more secure.

Install a Chrome extension:

- Open the Google Chrome browser on your computer.

- Go to the Chrome Web Store, which can be accessed through the Chrome menu or by visiting the web store directly at https://chrome.google.com/webstore.

- Search for the extension you want to install or browse the available extensions.

- Click on the extension you want to install to view its details and description.

- Click the "Add to Chrome" button located in the top right-hand corner of the extension's page.

- A confirmation pop-up will appear asking if you want to add the extension. Click the "Add Extension" button to confirm.

- Wait for the extension to download and install. Once it is finished, you will see a notification in the top right-hand corner of your browser.

1.GRAMMARLY: -

Grammarly is a must-have Chrome extension for all students and anyone who writes emails, documents, blogs or social media posts. It checks your spelling, grammar, and punctuation as you type and suggests corrections and improvements in real-time. Grammarly also provides detailed explanations and examples to help you learn and improve your writing skills.
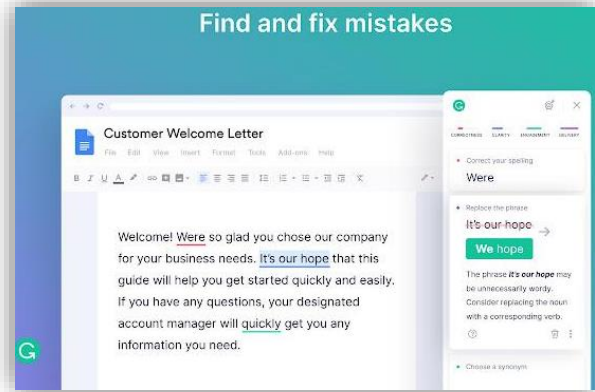

2.GOOGLE TRANSLATE: -

Google Translate is a very common and useful Chrome extension that can translate web pages, text, and images in over 100 languages. It can help you read foreign news, communicate with international colleagues, or learn a new language. Google Translate also allows you to customize your translation settings, listen to the pronunciation, and save translations for later.
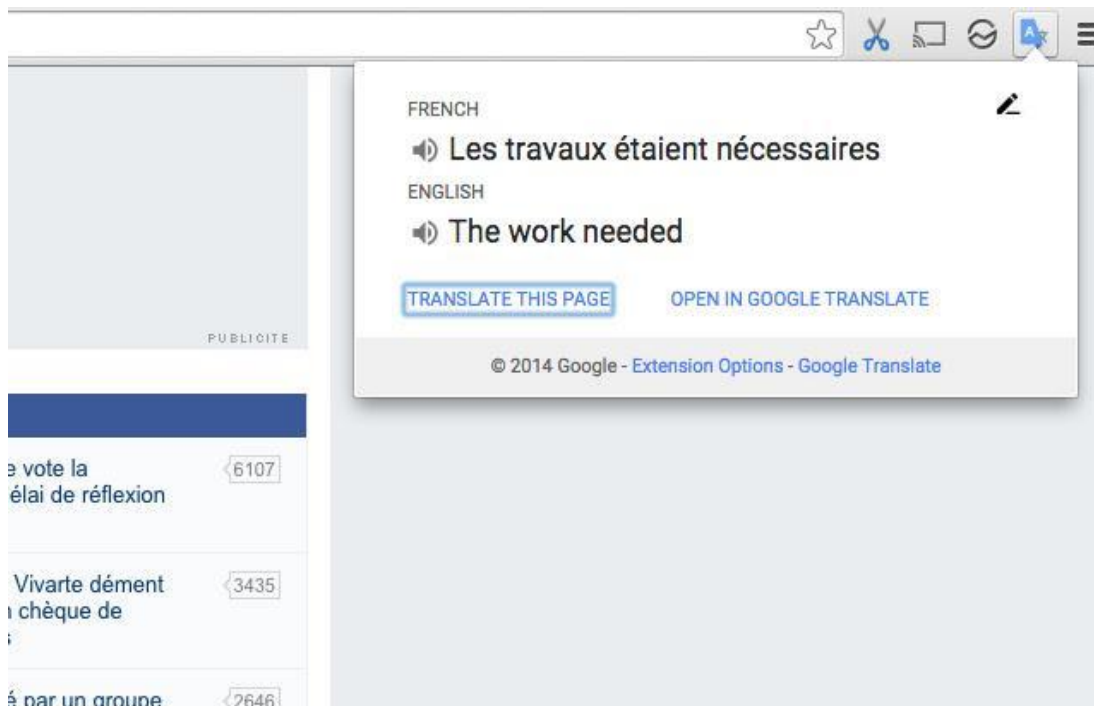
3.UBLOCK ORIGIN: -

Unblock Origin is a very useful Chrome extension for anyone who surfs web browsers many times a day. The main function of this extension is to block ads, pop-ups and other unwanted content without slowing down your browsing speed. It also supports advanced features, such as network filtering and custom rules, for advanced users. It saves much time while browsing, it's lightweight and very efficient to block ads.
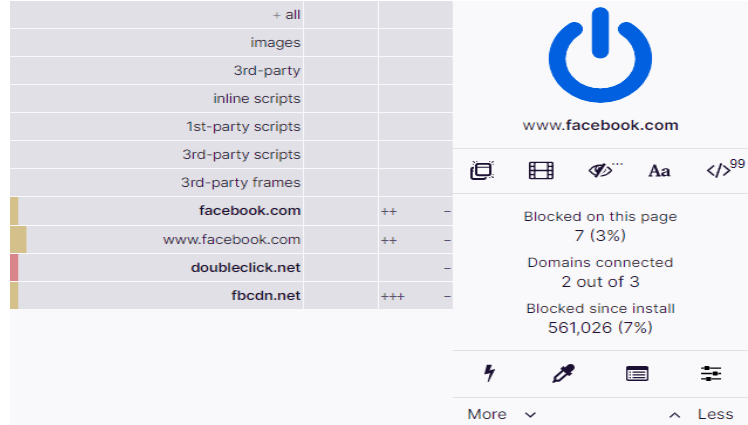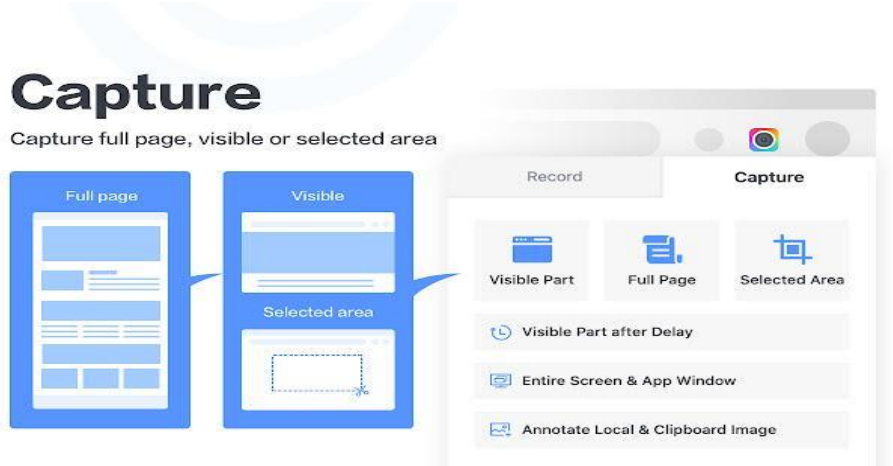
4.I DON'T CARE ABOUT COOKIES: -

I Don't Care About Cookies is a browser extension that automatically removes cookie warnings from websites. It is designed to help users browse the web without being interrupted by annoying cookie banners. It removes cookie warnings from almost all websites. It just blocks or hides the cookie warnings and pop-ups, but when it's needed for websites to work properly, it automatically accepts the cookies for us.
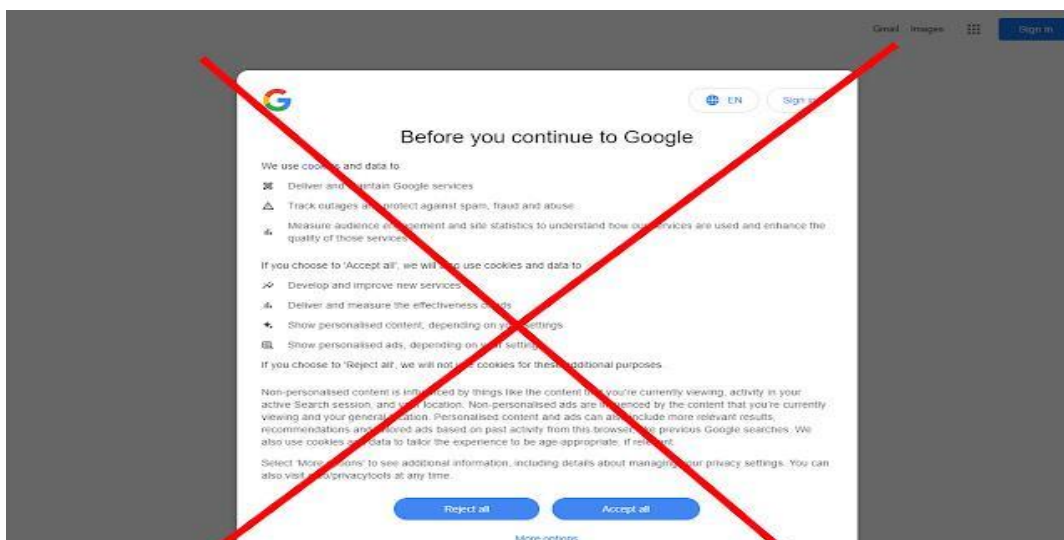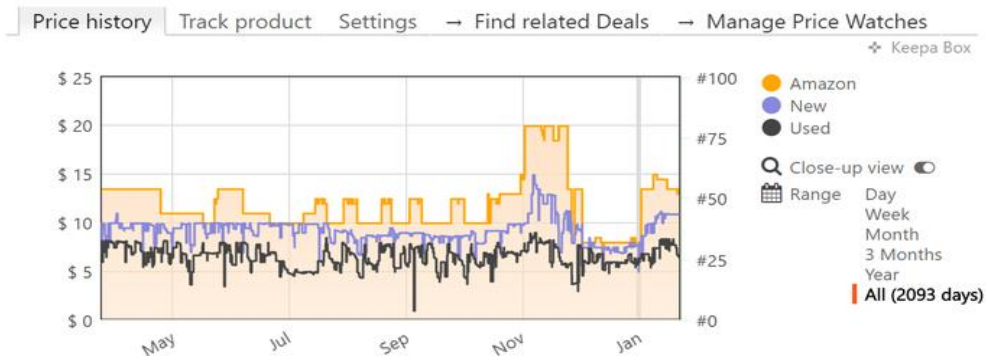
5.AWESOME SCREENSHOT AND SCREEN RECORDER: -

The extension is a free open-source extension for capturing screenshots and recording the screen. It is different from the snipping tool or print screen feature of our computers. It can capture a whole web page at once, we can also select a portion for a screenshot or can capture the visible part of the screen. For screen recording feature, it allows recording the current screen, camera or the current tab we using. The recordings and the screenshot save in cloud storage or the memory of our computers as we prefer.

6.KEEPA: -

Keepa is a free and very useful Chrome extension for anyone who loves to buy various products via Amazon's online shopping website. It can track all pricing and category data of the product that you want to buy. It tells you all the price history below that product. So, we can get a fair idea of the actual price of the product. It can compare the current price point and the previous price point of the product. We can also filter products while searching for a particular product by its special filter. It can save you money and time.

7.BLACKBOX:-

Blackbox is a very useful Chrome extension for all students. We all need to take notes while watching educational videos. Blackbox is the most efficient tool for copying text from videos. It can copy all texts from online videos very efficiently. It also can copy texts from images and can paste them anywhere we want. For developers, it's a useful extension which can copy codes from online tutorial videos.
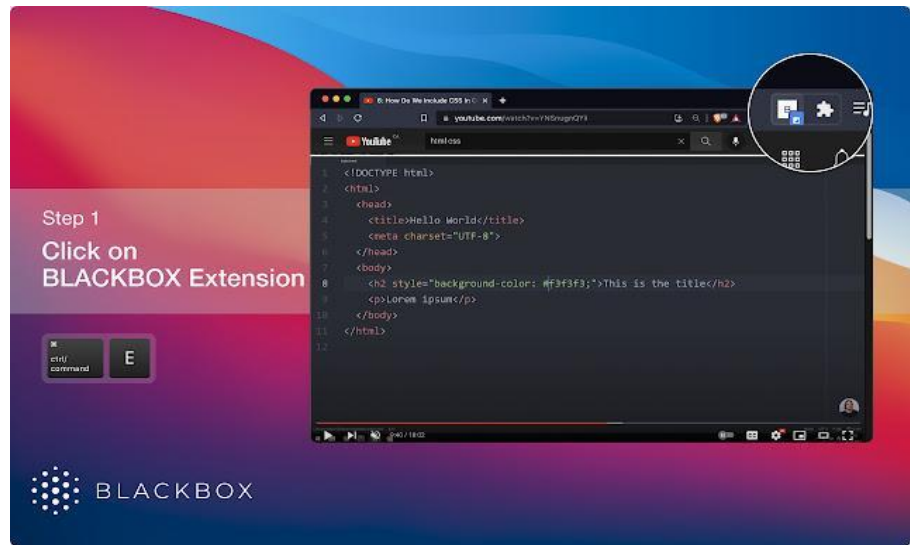
8.LASTPASS:-

Nowadays we need to sign up with our email and password for almost all websites to see their content and use their services. For that, we need a new password every day, and the tough thing is to remember them. LastPass is a free and perfect extension to tackle this problem. It's generally a password manager that securely stores your login credentials and other sensitive information in an encrypted vault. It generates strong, unique passwords for each website and auto-fills them for you, so you don't have to remember or type them manually. LastPass also supports multi-factor authentication and can sync your data across multiple devices and browsers.
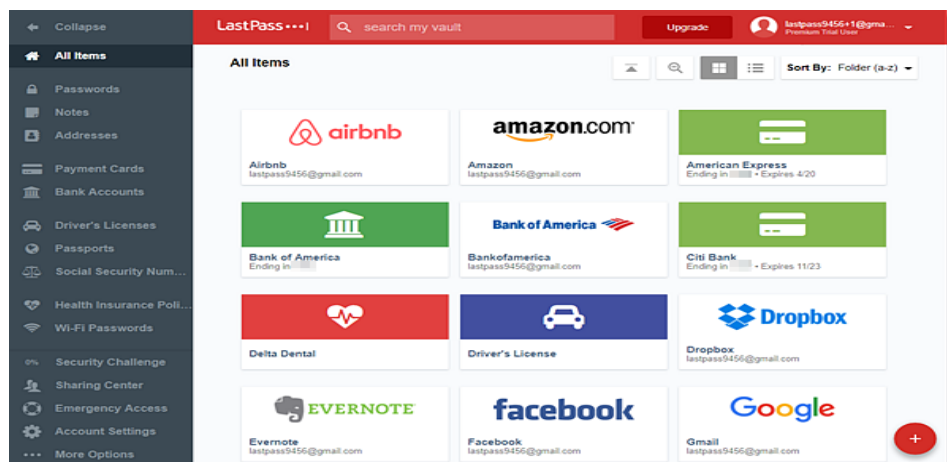
9.DUALLESS:-

Dualless is a very useful extension for all students and developers who need to multitask. When we need to do two works at the same time, we need to split the screen into two halves and it's a very annoying job to do. Dualless helps us to split the screen into two halves in one click. We can also manage the ratio of those screens. For developers, it's a perfect extension when we write the codes and need to see the result at the same time. For those students who have to take notes while watching a tutorial video, it's a useful extension.
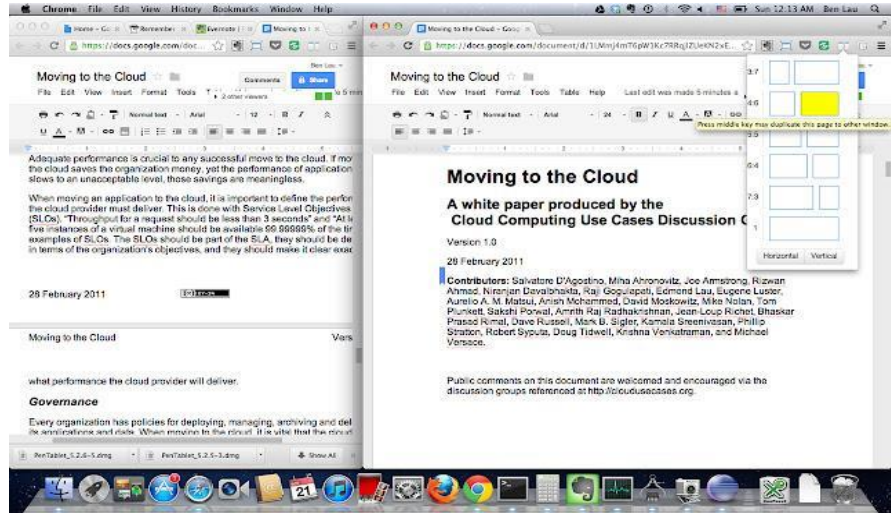
10.STAYFOCUSD:-

We all get distracted while watching educational videos or learning something from websites after some time. StayFocusd can help us not to get distracted at the time while we learning something. It's a productivity extension that restricts time-wasting websites such as Facebook, Instagram, Twitter etc. when we need to stay focused. We can manage how much time we need to restrict those distracting websites.
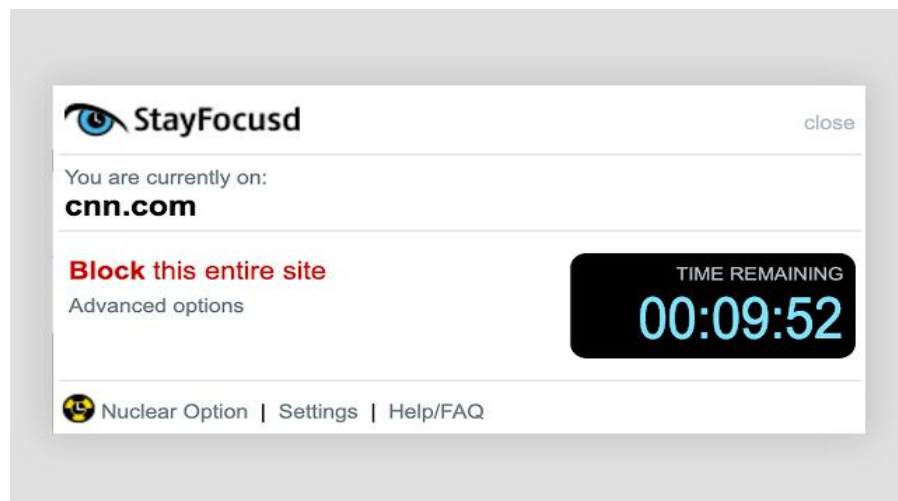
CONCLUSION: -

In conclusion, Chrome extensions are an essential tool for enhancing productivity, organization, and security while browsing the internet. By using these Chrome extensions, users can streamline their browsing experience, protect their privacy, and stay focused on their work. They can also save time by automating repetitive tasks, such as filling out forms or navigating to frequently visited websites. Whether you are a student, a professional, or a casual internet user these extensions are essential tools for anyone looking to enhance their browsing experience and stay focused on their work.

"The greatest enemy of knowledge is not ignorance, it is the illusion of knowledge."
— Stephen Hawking

50 WEBSITES IN OUR DAILY LIFE

ARIJIT ROY
Student, Semester: 4, Computer Science Dept

As the days go by, the internet is becoming an essential part of our daily lives. Nowadays, not a single day goes by without internet. It has become a source of information, entertainment, and communication for people all around the world. With so many websites available, it can be overwhelming to know which ones are worth your time. To make things easier, we have compiled a list of the top 10 websites that are popular and useful for different purposes.

Search Engine:

1. **Google -** The world's largest search engine that provides access to information and services.
2. **Wikipedia** - The free encyclopedia that provides reliable and up-to-date information on various topics.
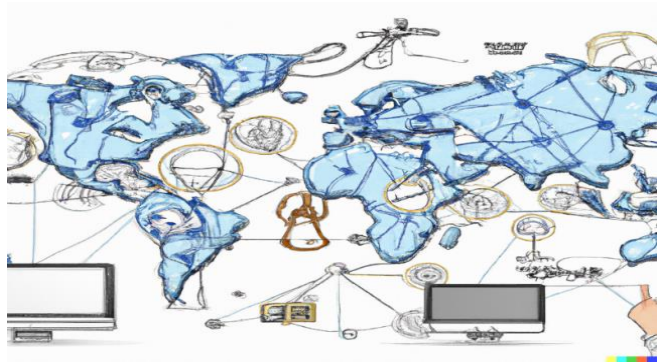
Social Media:

3. **YouTube** - The largest video-sharing site that offers a wide range of content for viewers.
4. Koo - Koo is an Indian microblogging and social networking service, owned by Bangalore-based Bombinate Technologies.
5. Instagram - A popular photo and video-sharing social networking site that allows users to share their life experiences.
6. Netflix - The world's leading subscription-based streaming service that offers movies and TV shows.

Blog:

7.Pinterest - A social networking site that allows users to discover and share ideas through images.
8.Reddit - A discussion forum where users can post content and engage in conversations on various topics.

Entertainment:

9. IMDb - The world's largest movie and TV database that provides information and ratings on various titles.

10.   Zoom - A video conferencing platform that allows users to host online meetings and webinars.

11.   Tours and Travel:

12.   TripAdvisor - A travel website that provides reviews and recommendations on various destinations.

13.   Medium - A publishing platform that allows writers to publish and share their articles with a global audience.

Software:

14.   Microsoft - A technology company that provides various software and hardware products and services.

15.   Adobe - A software company that provides various creative and design tools.

Drive & Storage in Cloud:

16.Dropbox - A cloud storage and file-sharing service that allows users to store and share files online.

17.Google Drive - A cloud storage and file-sharing service that allows users to store and share files online.

Programmers Community:

18.   GitHub - A platform for software developers to store, manage, and collaborate on their code.

19.   Stack Overflow - A Q&A website for software developers to ask and answer technical questions.

Education:

20.   NPTEL: Online learning platform founded in 2003 by the coming together of seven Indian Institutes of Technology and the Indian Institute of Science. NPTEL offers university/UG -level 4/8/12 week courses in science, technology, engineering and mathematics.

21.   Coursera - An online education platform that offers courses and degrees from top universities and institutions.

22.   Udemy - An online education platform that offers courses on various topics.

23.   Khan Academy - An education non-profit that provides free educational resources on various subjects.

24.   Duolingo - A language-learning platform that provides interactive lessons and exercises.

25.   TED - A non-profit organization that provides talks and presentations on various topics.

26.   Kuku FM- A audio book listening website where one can listen audio book with a huge collection.

Medical:

27.   WebMD - A website that provides health and medical information for patients and caregivers.

28.   Apollo pharmacy - Buy a wide range of medicine with lightning-fast delivery to your doorstep from **Apollo** 24x7.

News & World:

29.   CNN - A news website that provides breaking news and in-depth coverage of various topics.

30.   Daily Hunt: Daily hunt is an Indian content and news aggregator application based in Bangalore, India that provides local language content in 14 Indian languages from multiple content providers.

31.   Forbes - A business and financial news website that provides insights and analysis on various industries.

32.   CNBC - A news website that provides business and financial news and analysis.

33.   National Geographic - A website that provides information and insights on.

Artificial Intelligence:

34.   ChatGPT: ChatGPT is an artificial intelligence chatbot developed by OpenAI and can write report, essay, song, poem, email and any more in different language based on both supervised and reinforcement learning techniques.

35.   OpenAI - OpenAI is a leading AI research organization that aims to build safe and beneficial AI systems.

36.   Google AI - Google AI is an initiative by Google to conduct research and develop products that use AI to solve complex problems.

37.   TensorFlow - TensorFlow is an open-source machine learning framework developed by Google that allows developers to build and deploy AI models.

38.   Keras - Keras is a high-level neural networks API written in Python that can run on top of TensorFlow, Theano, or CNTK.

39.   Google Collab - Google Collab is a deep learning library that allows developers to build and train models quickly and easily.

40.   Kaggle -Kaggle is the world's largest data science community with powerful tools and resources to help you achieve your data science goals.

Career:

41.   LinkedIn - A social networking site designed for professionals and job seekers to connect and network.

42.   Naukri- Naukri.com is an Indian employment website operating in India and Middle East.

Business:

43.   Policybazaar: Policy bazaar is an Indian insurance aggregator and multinational financial technology company based in Gurgaon and provide all types of financial service including loan, IT Return and business news.

44.   Zerodha: India's biggest stock broker offering the lowest, cheapest brokerage rates for futures and options, commodity trading, equity and mutual funds.

Content Creation:

46.   Canva - A graphic design platform that allows you to create posters, flyers, social media posts, and more.

47.   Piktochart - A website for creating infographics, presentations, and reports.

48.   Animaker - A website for creating animated videos and presentations.

49.   Online Convert - A website for converting files between different formats, including image and video files.

50.   Remove.bg - A website for removing the background from images automatically.

In conclusion, these are the top 50 websites that are popular and useful for different purposes whether you're looking for information, entertainment, or communication, these websites obviously have something to offer you.

"Social media sites are among the most visited websites, with Facebook, Instagram, and Twitter ranking among the top 10 most visited sites globally.

CHIP DESIGNING

AMIT SHAW
## Student, Semester: 2, Computer Science Dept

INTRODUCTION: -

Chip designing is a process of designing a chip and is an essential part of electronics engineering. This process of chip design involves the knowledge of circuit design and its logic formation. All chips are made using basic elements which are known as transistors. The Metal OxideSilicon Field Effect Transistor (MOSFET) is the basic building block of digital chips which is used to make complex circuits.

Initially, this chip was used for military purposed but soon caught the attention of household and healthcare industry.
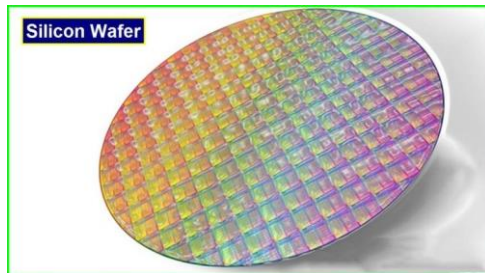
SEMICONDUCTOR CHIPS FABRICATION: -

In order for silicon to turn into a semiconductor chip, it needs to go through the several complex process of wafer manufacturing, oxidation, photolithography, etching, deposition and ion implementation, metal wiring, Eds and packaging.

Let's take a closer look at this essential semiconductor manufacturing process.
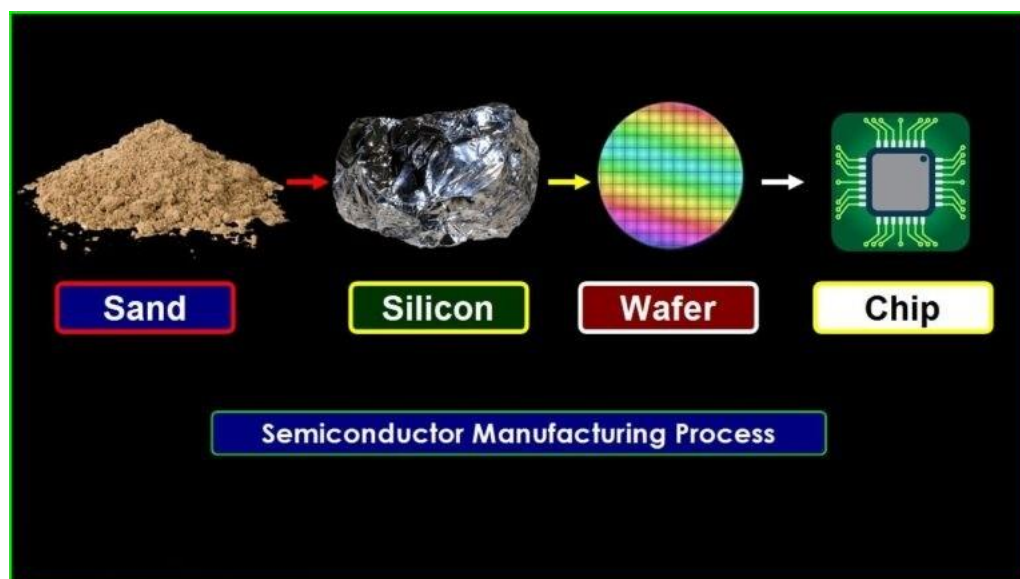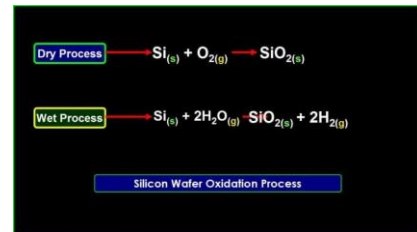
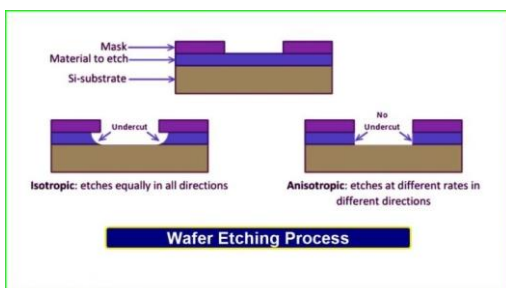## Let us now understand all of the above steps in detail

1. Silicon Wafer Manufacturing – The Foundation for all Semiconductor

Oxidation – Create Oxide Film on Wafer Surface.

Dry Process → $Si_{(s)} + O_{2(g)} \rightarrow SiO_{2(s)}$

Wet Process → $Si_{(s)} + 2H_2O_{(g)} \rightarrow SiO_{2(s)} + 2H_{2(g)}$

Silicon Wafer Oxidation Process

4. Etching – Remove Unnecessary Materials

Mask
Material to etch
Si-substrate

Undercut — Isotropic: etches equally in all directions

No Undercut — Anisotropic: etches at different rates in different directions

Wafer Etching Process

3. Photolithography – Draw Circuit Design on Wafer

Nozzle
Wafer
Thin solid film
Vacuum chuck
Dispensing
Spreading and solvent evaporation
Cast film

Wafer Photolithography Process

5. Deposition and Ion Implementation

2.

Doped Region
SiO_2
Si
PR
Si
Junction depth
Diffusion
Ion Implantation

Silicon Ion Implantation Process

6. Metal Wiring

Barrier metal
Aluminum
Oxide film
Implant
Wafer

Metal Interconnect in Semiconductor
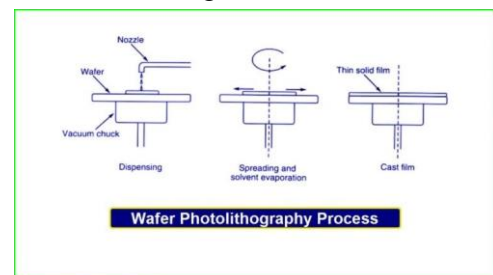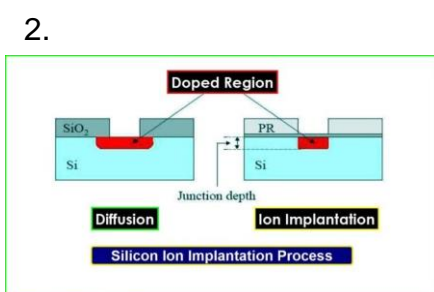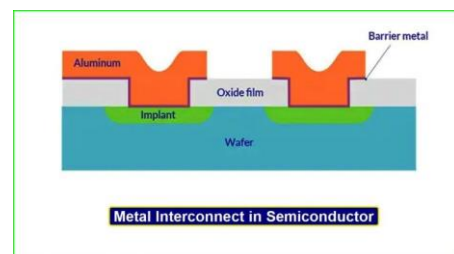
NEED OF SEMICONDUCTOR CHIPS: -

Before the popular silicon-based chips came to be, computers were big machines made of tubes and dials. They were impressive but fragile, not to mention a liability because of the amount of electricity they needed.

Semiconductor chips replaced the tubes, managing machines faster, cheaper, and more efficiently. Advances in design and size led us to light and sleek modern phones and smart equipment in a range of industries.

USE OF SEMICONDUCTOR CHIPS: -

Since semiconductor itself is not sold in stores as electrical appliances, it may to be hard to understand, but in fact it is used in many electric appliances.

For example, temperature sensors used in air conditioners are made with semiconductors. Rice cookers cook rice perfectly because semiconductors control the temperature precisely. CPUs that operate personal computers are also made with semiconductors. Many digital consumer products in everyday life such as mobile phones / smartphones, digital cameras, televisions, washing machines, refrigerators and LED bulbs also use semiconductors.

Where does India Stand in the Semiconductor Market?

India currently imports all chips and the market is estimated to touch $100 billion by 2025 from $24 billion now. However, for the domestic manufacturing of semiconductor chips, India has recently launched several initiatives:

• The Union Cabinet has allocated an amount of ₹76,000 crore for supporting the development of a 'semiconductors and display manufacturing ecosystem'. Consequently, a significant amount of incentives would be provided to design companies to design chips.

• India has also launched the Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS) for manufacturing of electronics components and semiconductors.

• In 2021, the MeitY also launched the Design Linked Incentive (DLI) Scheme to nurture at least 20 domestic companies involved in semiconductor design and facilitate them to achieve a turnover of more than Rs.1500 Crore in the next 5 years.

• India's own consumption of semiconductors is expected to cross USD 80 billion by 2026 and to USD 110 billion by 2030.

What are the Challenges for India to become a Semiconductor Chip Hub?

- **HIGH INVESTMENTS REQUIRED:**

Semiconductors and display manufacturing are a very complex and technology-intensive sector involving huge capital investments, high risk, long gestation and payback periods, and rapid changes in technology, which require significant and sustained investments.

- **MINIMAL FISCAL SUPPORT FROM GOVERNMENT:**

The level of fiscal support currently envisioned is minuscule when one considers the scale of investments typically required to set up manufacturing capacities in the various sub-sectors of the semiconductor industry.

- **LACK OF FABRICATION CAPACITIES:**

India has a decent chip design talent but it never built up chip fab capacity. The ISRO and the DRDO have their respective fab foundries but they are primarily for their own requirements and are also not as sophisticated as the latest in the world.

India has only one old fab which is located in Mohali, Punjab.

- **EXTREMELY EXPENSIVE FAB SETUP:**

A semiconductor fabrication facility (or fab) can cost multiples of a billion dollars to set up even on a relatively small scale and lagging by a generation or two behind the latest in technology.

- **RESOURCE INEFFICIENT SECTOR:**

Chip fabs are also very thirsty units requiring millions of liters of clean water, an extremely stable power supply, a lot of land and a highly skilled workforce.

CONCLUSION: -

So, it is clear that semiconductor chips are used in many devices and the sector of this industry is so vast. But there are a few countries who manufacturer these chips. India is totally dependent on these countries because there is no trace of India in this sector. If India wants to become

self-independent in sector, it has to overcome from all the challenges because without these chips, present world can't be imagined.

ALGORITHM- USE OF ALGORITHM IN DAILY LIFE

SAIKAT GHOSH
Student, Semester: 4, Computer Science Dept

Introduction: In computer programming terms, an algorithm is a set of well-defined instructions to solve a particular problem. It takes a set of input(s) and produces the desired output. Algorithm refers to a sequence of finite steps to solve a particular problem.
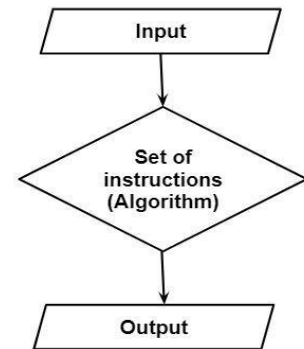
When we use some steps to solve a particular task then that is called procedure. And this procedure is called Algorithm when we try to solve this task in computer. The term Algorithm become a most Powerful and popular when it used to solve a particular task in a computer.

HOW TO WRITE AN ALGORITHM TO SOLVE A PARTICULAR TASK IN COMPUTER?

Example: Add two numbers and display the result.

Step 1: Start

Step 2: Declare variables num1, num2, sum.

Step 3: Read value of num1 and num2.

Step 4: Add the num1 and num2 and store the result into sum (sum <- num1 + num2).

Step 5: Display the sum.

Step 6.: stop.

Application In our daily lives:

Algorithms are used in many ways, including by students. Here are some examples of how algorithms are used in daily life, especially for students:

1.Search engines - Search engines like Google use algorithms to display search results that are most relevant to the user's query.

2.Social media algorithms - Social media platforms like Facebook and Instagram use algorithms to show users content that is most relevant to them based on their interests and engagement.

3.Online shopping - Online retailers like Amazon use algorithms to recommend products to customers based on their browsing history and purchase behavior.

4.GPS navigation - Navigation apps like Google Maps and Waze use algorithms to determine the fastest and most efficient routes to a destination based on real-time traffic data.

5.Language learning - Language learning apps like Duolingo use algorithms to track a user's progress and personalize the learning experience.

6.Personal finance - Budgeting apps like Mint use algorithms to categorize expenses and provide personalized budgeting advice.

7.Health and fitness - Fitness tracking apps like Fitbit use algorithms to track a user's activity levels and provide personalized workout recommendations.

8.Online education - Online learning platforms like Coursera use algorithms to personalize the learning experience by recommending courses based on a user's interests and
skills.

Use of algorithm in different field:

Computer Science: Algorithms form the basis of computer programming and are used to solve problems ranging from simple sorting and searching (Linear, Binary) to complex tasks such as artificial intelligence and machine learning.

Mathematics: Algorithms are used to solve mathematical problems, such as finding the optimal solution to a system of linear equations or finding the shortest path in a graph.

Operations Research: Algorithms are used to optimize and make decisions in fields such as transportation, logistics, and resource allocation.

Artificial Intelligence: Algorithms are the foundation of artificial intelligence and machine learning, and are used to develop intelligent systems that can perform tasks such as image recognition, natural language processing, and decision-making.

Data Science: Algorithms are used to analyses, process, and extract insights from large amounts of data in fields such as marketing, finance, and healthcare.

Need of Algorithm:

- **Efficiency** - Algorithms can help to perform tasks and solve problems more efficiently than manual methods. Time and space complexity work in this

area.

- **Consistency** - Algorithms perform tasks in a consistent and reliable manner, regardless of external factors. This makes them useful for automating repetitive tasks and reducing the risk of errors.

- **Scalability** - Algorithms can be scaled up or down depending on the size of the problem or the amount of data being processed. This makes them useful for handling large-scale problems and data sets.

- **Optimization** - Algorithms can be designed to optimize a specific goal or objective, such as maximizing profit or minimizing cost. This makes them useful for decision-making and optimization problems.

- **Innovation** - Algorithms can be used to develop new technologies and innovations, such as artificial intelligence and machine learning.

- **Standardization** - Algorithms provide a standardized method of solving problems, which can be used across different industries and applications.

Types of Algorithm:

1. **Sorting Algorithms -** Algorithms that arrange a collection of items in a specific order, such as alphabetical or numerical order.
2. **Searching Algorithms-** Algorithms that find the location of a specific item or value in a collection of data.
3. **Pathfinding Algorithms -** Algorithms that find the shortest path between two points in a graph or network.
4. **Computational Algorithms** - Algorithms that solve mathematical or scientific problems, such as calculus or physics equations.
5. **String Matching Algorithms** - Algorithms that find patterns within a string of characters or text.
6. **Optimization Algorithms -** Algorithms that find the best solution for a problem with multiple possible solutions.
7. **Divide and Conquer Algorithms** - Algorithms that divide a problem into smaller subproblems and solve each subproblem separately.
8. **Dynamic Programming Algorithms -** Algorithms that break down a problem into smaller subproblems and solve each subproblem only once to save computation time.
9. **Randomized Algorithms** - Algorithms that use randomness to improve their efficiency or accuracy.
10. **Greedy Algorithms** - Algorithms that make locally optimal choices at each step to find the global optimal solution.

Advantage of Algorithm:

- It is easy to understand.
- An algorithm is a step-wise representation of a solution to a given problem.

- In Algorithm the problem is broken down into smaller pieces or steps hence, it is easier for the programmer to convert it into an actual program.

Disadvantage of Algorithm:

- Writing an algorithm takes a long time so it is time-consuming.

- Understanding complex logic through algorithms can be very difficult.

- branching and Looping statements are difficult to show in Algorithms.

Few Websites for Learning the Algorithm:

- ✓ www.geeksforgeeks.org

- ✓ www.programiz.com

- ✓ www.javatpoint.com

- ✓ www.tutorialspoint.com

- ✓ www.scaler.com

CONCLUSION: In summary, algorithms are used in various aspects of our daily lives, including education, health and fitness, online shopping, and more. Students can benefit from algorithms by using technology and digital tools that use algorithms to enhance their learning experience, improve their productivity, and achieve their academic goals more efficiently. To become systematic and to timely completion of a work only algorithm can only a person.

BIG DATA

DIPSAYAK SAHA
Ex-student of, Computer Science Dept.

Big data is defined as data that is either impractical or impossible to process using conventional techniques because it is so huge, quick, or complex. Large-scale data access and storage for analytics has been practiced for a very long time. However, the idea of big data gained traction in the early 2000s when industry analyst Doug Laney outlined the three V's, which are now generally accepted as the definition of big data:

Volume: Organizations get information from a range of sources, including sales, Internet of Things (IoT) devices, machinery, social media, videos, photos, and audio. The expense of keeping all much data would have been prohibitive in the past, but data lakes, Hadoop, and the cloud have made it more affordable.

Velocity: Data enters businesses at an unprecedented rate as a result of the expansion of the Internet of Things, and this data needs to be processed quickly. The requirement to manage these data deluges in close to real time is driven by RFID tags, sensors, and smart meters.

Variety: Data can be stored in a variety of formats, including unstructured text files, emails, videos, audio files, market ticker data, and traditional databases that store structured, quantitative data.

Big Data: Why Is It Important?

Big data's significance is not just dependent on the volume of data you have. It's worth depends on how you use it. Any data source can be used to gather information, which can then be analyzed to discover solutions that

1) simplify resource management,

2) boost operational effectiveness,

3) optimize product development,

4) provide new income and growth prospects, and

5) facilitate wise decision-making.

Big data and high-performance analytics enable the completion of business-related tasks like:

- ✓ identifying the underlying causes of problems, errors, and flaws in close to real time.

- ✓ quicker and more precisely detecting irregularities than the human eye.

- ✓ enhancing patient outcomes by quickly extracting knowledge from medical picture data.

On whom is the focus of big data?

For industries, big data is a major issue. The amount of information that organizations gather, manage, and analyze greatly increased as a result of the IoT and other linked devices. significant data has the potential to provide significant insights for all industries, big and small.

How Big Data Functions?

Businesses should think about how big data flows among a variety of locations, sources, systems, owners, and users before putting it to use for them. The "big data fabric"—which combines traditional, structured data with unstructured and semi structured data—can be managed in five main steps:

- ✓ Plan your big data approach.

- ✓ Identify the sources of large data.

- ✓ Data management, storage, and access.

- ✓ Review the data.

- ✓ Make informed decisions based on the data.

"Data is the new oil. It's valuable, but if unrefined it cannot really be used. It has to be changed into gas, plastic, chemicals, etc. to create a valuable entity that drives profitable activity; so must data be broken down, analyzed for it to have value."

*- Clive Humby, data science pioneer*

MODERN SPATIAL CLUSTERING ALGORITHMS

SOUPARNO BASAK
### Student, Semester: 6, Computer Science Dept

Spatial clustering algorithms are a class of machine learning techniques that are used to group together data points based on their spatial or geographical characteristics. These algorithms are widely used in fields such as geography, ecology, epidemiology, and urban planning, among others. In recent years, there has been a significant increase in the development of modern spatial clustering algorithms, which have improved the accuracy and efficiency of clustering.

One of the most popular modern spatial clustering algorithms is DBSCAN (Density-Based Spatial Clustering of Applications with Noise). DBSCAN identifies clusters by grouping together data points that are close to each other and have a high density of neighboring points. Unlike other clustering algorithms, DBSCAN can handle datasets with noise and outliers, and it can also identify points that do not belong to any cluster. DBSCAN is particularly useful in identifying clusters of different sizes and densities in spatial data.
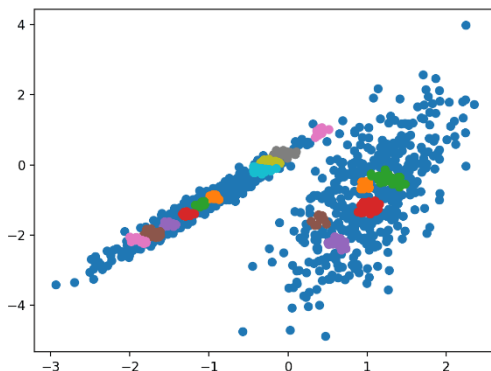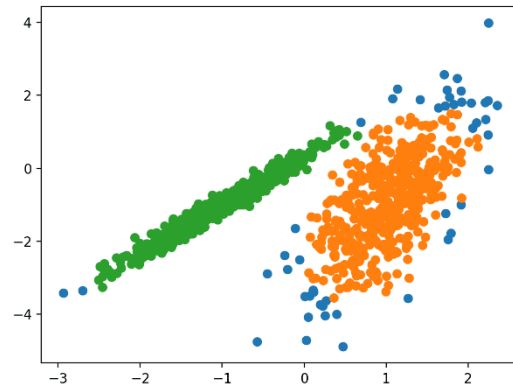
Another popular algorithm is OPTICS (Ordering Points to Identify the Clustering Structure), which works similarly to DBSCAN but can handle datasets with varying densities and noise levels. OPTICS orders points based on their connectivity and density, identifying clusters based on changes in the ordering. This algorithm is useful in detecting clusters of varying densities, shapes, and sizes.

HDBSCAN (Hierarchical Density-Based Spatial Clustering of Applications with Noise) is an extension of DBSCAN that uses hierarchical clustering. HDBSCAN constructs a hierarchy of clusters, with each level of the hierarchy representing clusters of increasing size and density. The algorithm then selects the optimal clustering based on a balance between cluster density and size. This algorithm is useful in identifying clusters of different sizes and densities in complex spatial data.
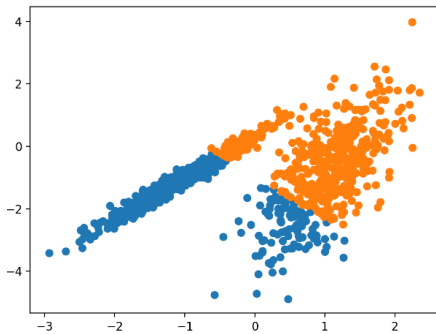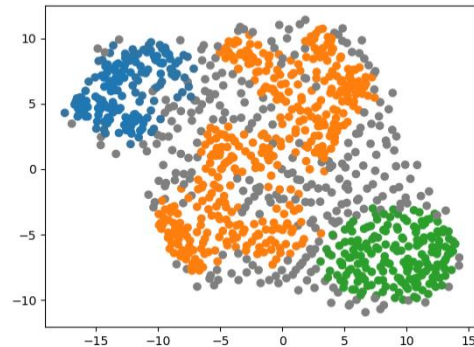
K-Means Clustering is a simple algorithm that divides a dataset into K clusters, where K is a user-defined parameter. The algorithm iteratively assigns each data point to the nearest cluster based on its distance from the cluster centroid. K-Means Clustering is often used for image segmentation, customer segmentation, and other applications. This algorithm is useful in identifying clusters in large datasets with a high number of dimensions.

Dimensionality reduction techniques such as PCA (Principal Component Analysis) and t-SNE (t-Distributed Stochastic Neighbor Embedding) are also used in spatial clustering algorithms. These techniques can reduce high-dimensional data to a lower-dimensional space while preserving the underlying structure of the data. This helps overcome the "curse of dimensionality," whereas the number of dimensions increases, the volume of the space increases exponentially, making it more difficult to identify meaningful clusters.

Several other spatial clustering algorithms have been developed in recent years, such as DBSCAN* (a variant of DBSCAN that can handle datasets with varying densities), OPTICS* (an extension of OPTICS that can handle datasets with noise and varying densities), and K-Means++ (an improved version of K-Means that initializes the cluster centroids in a smarter way). These algorithms are constantly evolving and improving, as researchers and practitioners continue to develop new techniques and approaches.

Spatial clustering algorithms have numerous applications in various fields. In geography, these algorithms can be used to identify areas of high biodiversity or to analyze patterns of urbanization. In ecology, they can be used to identify habitats of endangered species or to study the spread of invasive species. In epidemiology, they can be used to identify disease hotspots or to track the spread of infectious diseases. In urban planning, they can be used to identify areas of high crime rates or to analyze patterns of transportation usage.

One application of spatial clustering algorithms is in the field of geospatial analysis. Geospatial analysis is the process of analyzing data that has a geographic component, such as satellite imagery or GPS data. Spatial clustering algorithms can be used to identify patterns in this data, such as areas of high or low population density, or areas with a high or low concentration of certain types of land use. Geospatial analysis can be useful in many fields, such as urban planning, disaster response, and natural resource management.

For example, geospatial analysis can be used in disaster response to identify areas that are most vulnerable to natural disasters such as floods, earthquakes, or wildfires. Spatial clustering algorithms can help identify areas that are at high risk based on factors such as topography, soil type, and previous history of disasters. This information can then be used to develop effective disaster response plans and allocate resources where they are most needed.

Another application of spatial clustering algorithm is in the field of transportation planning. These algorithms can be used to identify areas with high traffic congestion, which can help transportation planners develop strategies to reduce congestion, such as adding new public transportation options or improving existing road networks. They can also be used to identify areas with low levels of access to public transportation, which can help planners develop strategies to improve accessibility for those who rely on public transportation.

In the field of crime analysis, spatial clustering algorithms can be used to identify areas with high crime rates, which can help law enforcement agencies develop strategies to reduce crime in those areas. These algorithms can also be used to identify patterns in the types of crimes being committed, which can help law enforcement agencies develop targeted interventions to prevent those crimes from occurring.

Spatial clustering algorithms can also be useful in marketing and advertising. These algorithms can be used to segment customers based on their geographic location, which can help businesses develop targeted marketing strategies to reach specific customer groups. For example, a business might use spatial clustering algorithms to identify areas with high concentrations of potential customers, and then develop targeted advertising campaigns to reach those customers.

In conclusion, modern spatial clustering algorithms have revolutionized the field of data analysis, making it possible to identify complex patterns in spatial data that were previously difficult or impossible to identify. These algorithms have numerous applications in fields such as geography, ecology, epidemiology, urban planning, and many others. As these algorithms continue to evolve and improve, they will become even more powerful tools for understanding the complex spatial patterns that underlie our world.

"Spatial data clustering is a key tool for exploratory data analysis, enabling us to identify and explore patterns and relationships in data that might not be immediately apparent." - A. Stewart Fotheringham.

Why should we use Laravel instead of raw PHP!!

SIMANTA DAS

STUDENT: SEM-VI Computer Science Dept

History   **Taylor Outwell**

Laravel was created by Taylor Otwell, a Canadian software developer. He first released Laravel as an open-source PHP web application framework in 2011, and it has since become one of the most popular PHP frameworks in the world. Otwell continues to lead the development of Laravel, along with a team of core contributors and a large community of developers who contribute to the project. Laravel is licensed under the MIT License.

In this modern world, we **can develop web-applications (ex: flipkart, amazon, Netflix, hotstar, zee5 etc.) using various backend technologies**. Most common of them are: JavaScript (nodejs), Python3 (flask), java (Spring Boot), **PHP (Laravel)** etc.

In all over the world **PHP holds up to 80% market share**, for web applications. But for making production applications using raw PHP is not a good choice. So we can use PHP frameworks like codigniter, Laravel, cake PHP, Drupal etc. But according to recent media articles **'Laravel' is treated as the most-demanding & useful framework for building backend applications using PHP** for production purpose.

⇨ Why should we use Laravel instead of raw PHP!!

Laravel is a popular PHP framework that provides a wide range of features and functionalities for web development. Here are some reasons why you should consider using Laravel over raw PHP:

> **Simplified coding:** Laravel provides an elegant and simple syntax that reduces the amount of boilerplate code required in PHP. This allows developers to focus on the core logic of the application and write cleaner, more maintainable code.
> **Faster development:** Laravel offers a range of built-in features and tools that speed up the development process, such as an ORM, authentication, routing, caching, and more. This allows developers to build complex applications quickly and efficiently.
> **Secure:** Laravel provides built-in security features such as encryption, CSRF protection, and secure authentication. This makes it easier to build secure applications and protects them against common web vulnerabilities.
> **Modular:** Laravel follows the modular design pattern, which allows developers to build reusable and modular components. This makes it easier to maintain and scale the application over time.
> **Active community:** Laravel has a large and active community of developers who contribute to the development and maintenance of the framework. This ensures that the framework stays up-to-date with the latest trends and technologies in web development.

⇨ Security benefits of using Laravel!!

Laravel is a popular PHP framework that provides a wide range of features and functionalities for web development. Here are some reasons why you should consider using Laravel over raw PHP:

➢ **Authentication:** Laravel has built-in authentication features that can be easily configured to secure access to different parts of your application. This includes multi-factor authentication, password reset, and remember me functionality.

➢ **Authorization:** Laravel's authorization system allows developers to define user roles and permissions to control access to different parts of the application.

➢ **Encryption:** Laravel provides a simple and secure way to encrypt and decrypt data. This is particularly useful when handling sensitive information such as passwords, credit card numbers, and other personal information.

➢ **CSRF protection:** Laravel includes built-in protection against CSRF (cross-site request forgery) attacks. This feature generates a unique token for each user session and ensures that all form submissions are validated against this token.

➢ **SQL injection prevention:** Laravel uses prepared statements and parameter binding to prevent SQL injection attacks, which are a common vulnerability in web applications.

➢ **XSS prevention:** Laravel provides several built-in features for preventing cross-site scripting (XSS) attacks. This includes output escaping and sanitization of user input.

➢ **Password hashing:** Laravel uses bcrypt hashing to store passwords securely. This makes it much more difficult for attackers to guess or crack passwords.

""A good programmer is someone who always looks both ways before crossing a one-way street." - Doug Linder, computer scientist

The Age of Microcontroller

BINAY KUMAR DAS

STUDENT: SEM-IV Computer Science Dept

A microcontroller is nothing but a small, low-cost, and self-contained computer integrated into a single chip, also known as an IC or integrated circuit, which contains a processor, memory, and input/output peripherals. It is used to control devices in many applications, from simple household appliances such as coffee makers, washing machines, and air conditioners to complex industrial machinery.

The simple function of any microcontroller is to control the voltage level. On the market, there are many different types of microcontrollers available, such as PIC Microcontrollers, ARM Microcontrollers, 8051 Microcontrollers, AVR Microcontrollers, MSP Microcontrollers, Arduino, etc. But in this article, we will discuss Arduino only.

In this article, we will first explore the history, workings, applications, and future of microcontrollers.

History of Microcontrollers:

The first microcontroller was invented between 1970 and 1971 when Intel was working on inventing the world's first microprocessor. And on the other hand, Gary Boone of Texas Instruments was working on a similar concept and invented the first microcontroller called the TMS1000, which consists of a processor, memory, and input/output peripherals. And did you know that this invention revolutionized the field of electronics as it made it possible to control devices with a single chip instead of a large number of separate components?

Working of Microcontrollers:

A microcontroller processes data given to its input pins using its CPU and gives output via its output pins. It is executed or driven by a synchronous sequential logic circuit. Or, in simple words, understanding the working of a microcontroller is as

simple as understanding the working of a computer because they both have a very similar structure. The only difference between a computer and a microcontroller is that in a computer the CPU, memory, and serial interface are separate, whereas in a microcontroller the CPU, memory, and serial interface are integrated into a single chip.

Applications of Microcontrollers:

Microcontrollers have a wide range of applications in various industries, including automotive, aerospace, consumer electronics, and medical devices. They are used in automotive systems to control engine management, powertrain, and safety systems. In aerospace, they are used in flight control systems, navigation systems, and communication systems. Consumer electronics are used in smart home devices, wearable technology, and mobile devices. Medical devices are used in pacemakers, insulin pumps, and blood glucose meters. As microcontrollers are becoming more powerful and efficient, they are being used in more advanced applications, such as robotics, the Internet of Things, and artificial intelligence.

The Future of Microcontrollers:

The future of microcontrollers looks bright, as they continue to become more powerful, smaller, and more energy-efficient. This will lead to new applications in areas such as artificial intelligence, the Internet of Things, and robotics. Microcontrollers will be used to control and monitor smart homes, cities, and transportation systems. They will also be used in autonomous vehicles and drones.
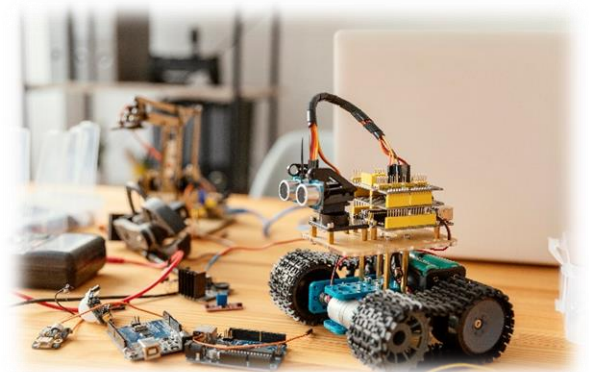

Learning about Microcontrollers:

Learning about microcontrollers can be a challenging task, but there are many resources available to help beginners. Online tutorials, books, and classes can help learners understand the basics of microcontroller programming, hardware design, and debugging. Microcontroller development kits are also available and provide everything needed to start developing applications.

Arduino:

One of the most popular microcontrollers on the market is Arduino. The Arduino is an open-source platform that allows developers to create interactive electronic devices using simple software and hardware components. It has become a go-to choice for hobbyists and professionals alike due to its ease of use and versatility. Arduino is the best choice and easiest-to-use device for electronics projects and IOT-based applications.

Types and How to Choose the Best Arduino Boards:

There are different types of Arduino boards available in the market as per your requirements. Examples of the most popular Arduino boards are the Arduino UNO, Arduino Nano, Arduino PRO Mini, Arduino Leonardo, Arduino Micro, Arduino Nano Every, and Arduino Mega2560 Rev3. It is best to choose an Arduino board according to your requirements, but in my opinion, the Arduino UNO and Arduino Nano are the best for every small and large project.
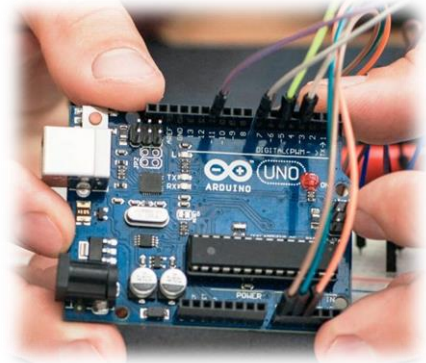
Installation and setup:

It is best to build electronic projects with Arduino. Building a project with Arduino is not easy, but it's not so hard. First of all, you need to install the Arduino IDE from Arduino's official website, 'www.arduino.cc'. You can also visit the official website, 'www.arduino.cc' for the installation process. Then, after installation, you have to set up your Arduino board on your computer, and to know the method of setup, you can visit the official website.

How to use Arduino:

To make any project from Arduino, you must know the Arduino programming language and how to use the Arduino IDE (Integrated Development Environment), for which you will find lots of online tutorials on Google, YouTube, and the official Arduino website for free. Additionally, the Arduino IDE uses a simplified version of C++, but in this article, we will not discuss Arduino programming or coding in detail; to learn Arduino programming, visit www.arduino.cc.

Advantages of Microcontrollers:

One of the most significant advantages of microcontrollers is their versatility. They can be programmed to perform a variety of tasks, making them suitable for use in numerous applications. For example, they can be programmed to measure temperature and humidity, control motor speed, and even operate a robot. Another advantage of microcontrollers is their low power consumption. As they are designed to run on battery power, they can operate for extended periods without the need for frequent recharging. This makes them ideal for use in portable devices such as medical instruments, handheld electronics, and wearables.

Conclusion:

In conclusion, microcontrollers have revolutionized the world of electronics, providing a powerful and efficient solution for controlling devices. They have a wide range of applications in various industries and are becoming more accessible to learners of all backgrounds. With the right resources and tools, anyone can learn to program and develop applications for microcontrollers, leading to exciting new possibilities in the future.
"YOU CAN DO ANYTHING BY MANIPULATING THE FLOW OF ELECTRONS, IT'S LIKE MAGIC, JUST FEEL IT"

--THE END-

"A QUICK TOUR OF THE NEURAL NETWORK MODELS"
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Speaker: Dr. Saptarshi Goshwami, Asst Prof.(CS)
Bangabasi College (Morning)

This program is going to be organized by the Department of COMPUTER SC of Sir Gurudas Mahavidyalaya. This webinar focuses on a brief on Nural Network, how evaluation goes from Machine instruction to Machine Learning of Nural Network.

DATE & TIME :
26TH JUNE,2021
SATURDAY, 11 PM

White Space

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