



EINSTEIN ACADEMY OF TECHNOLOGY AND MANEGEMENT (EATM)

(Approved By AICTE, Govt.of New Delhi)

Affiliated to BPUT, Odisha

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ALVARO-CS

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Annual Technical Magazine

Department of Computer Science and Engineering

Department of Computer Science and Engineering

VISION

- To achieve excellence in the field of computer science and engineering with a goal to create state-of-the-art technocrats to address the future challenges in this fast growing technological world.

MISSION

- Imparting innovative quality education, viz. strong fundamental concepts, analytical capability, programming and problem solving skills, to meet the technological and socio-economic needs of the region and the country as well.
- Facilitating in-house value added courses and professional trainings with an emphasis on basic principles of Computer Science and Engineering
- Encouraging students for higher studies to inculcate research activities in emerging areas of science and technology.
- Promoting industry-institute interaction for the enhancement of technical and entrepreneurial skills.

Creative Desk

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Professor,
(Reviewer Technical Magazine)

Prof. Riyazuddin Khan,
Associate Professor,
(Reviewer Technical Magazine)

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Assistant Professor,
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B.Tech. (CSE)
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Chairmen's Message



**Basanta Kumar Bisoi,
Chairman, EATM**

It is often said "Give me a copy of your college Technical Magazine", I will tell you about the quality of your college. "I strongly believe in this statement. Magazine carries the contributions reflecting ethos and aspirations of the faculty, students and other team members of an institution. I am happy to know that Computer Science & Engineering Department is bringing out its department technical magazine ALVARO-CS for year 2020-21. It is my pleasure to congratulate the editorial team for bringing out a quality Technical Magazine. Reading this technical Magazine would definitely be an inspiration and motivation for all students and staff to contribute even more to the forthcoming issues.

Secretary's Message



**Sri Krushna Chandra Bisoi
Secretary's EATM**

ALVARO-CS is the manifestation of the desire of Computer Science Faculty and Students to share their innovative ideas on common platform. It gives me great pleasure to know that ALVARO-CS for year 2020-21 is ready for publication. This magazine is a perfect blend of magnificent and groundbreaking articles. It has concentrated in disseminating information to the student community and quenches their thirst for knowledge updations. I am very glad to congratulate the editor for their hard work and bringing out this edition.

Message

Principal's Message



Dr. Suwendu Prasad Sahu
Principal, EATM

“Alvaro-CS” is the annual magazine released by the Department of Computer Science & Engineering for the year 2020-21. It is a blend of exquisite articles and innovative ideas from the faculty and new – age Students of Computer Science & Engineering Department. I strongly believe that the informative articles & innovative ideas presented in the magazine will be appealing and useful to the readers.

Dean Academics Message



Dr. Biswajit Nayak

“Alvaro-CS” for the year 2020-21 is the manifestation of the choice of the Computer Science Faculty and Students to percentage their revolutionary thoughts on a not unusual place platform. It offers me brilliant satisfaction to realize that Alvaro departmental mag is prepared for publication. This E-magazine is a great mixture of magnificent and groundbreaking articles. It has targeting disseminating facts to the pupil network and quenches their thirst for know-how updates. I am very satisfied to congratulate the editor for his or her tough paintings and bringing out this edition.

HOD's Message



Dr. Anil Kumar Mishra
(Department of Computer Science and Engineering)

“Coming together is a beginning, keeping together is progress and working together is success” – This E-magazine ALVARO-CS for year 2020-21, a flag ship magazine of Computer Science & Engineering Department of Einstein Academy of Technology and Management Engineering College, is the culmination of the never tiring initiative and endeavors taken by the faculty and students of CSE. The Magazine strives to inform, engage, inspire and educate diverse readership on developments in Computer Science field.

Intelligence In Cyber Security

Mr.. Sanjaya Kumar Sen - Assistant Professor

Introduction :

We are living in a digital era, whether it be booking a hotel room, ordering some food or even booking a cab, we are constantly using the Internet and inherently, constantly generating data. This data is generally stored on the cloud which is basically a huge data server or data center. We use an array of devices to access this data. Now for a hacker, it's a golden age with so many access points, public IP addresses and constant traffic and tons of data to exploit. The day to day raising and progressing cyber attacks can be reduced by the integration of Artificial Intelligence into cyber security systems.

AI in Cyber Security :

The generation of data in today's world is increasing and the information stored or received in any form, whether directly or indirectly, through the internet is increasing. Moreover, the data has to be sent over a network to a destination safely, hence proper transmission of data plays a vital role which can be achieved by principles of Cyber Security.



AI and CyberSecurity are broad terms and we can use it both to mitigate risks and increase revenue by detecting cyber threats and fraud. However, keeping up with the new viruses and malware updates is becoming more difficult. Cyber Security using AI technologies will facilitate the detection and response to threats and malware by using previous cyber-attack data to determine the best course of action. The faster the data breach was identified and contained, the lower the costs and could save a lot to companies.

AI TECHNIQUES FOR CYBER SECURITY

Expert Systems

An Expert System is a computer system that emulates the decision making ability of a human expert. This is a best example of a Knowledge based system [1]. These knowledge-based systems are composed of two sub-systems: the Knowledge Base and the Inference Engine. The knowledge base represents the illustrations and assertions in the real world [2]. The Inference Engine is an automatic reasoning system. It evaluates the current situation of the knowledge base and applies the rules relevant to that, then asserts new knowledge into it.

The Security Expert System follows a set of rules to battle cyber-attacks. It checks the process with the knowledge base if it is a wellknown process then the security system ignores otherwise the system would terminate the process [3]. If there is no such process in the knowledge base, then using inference engine algorithms (rule sets), the expert system finds out the machine state. The machine state has been composed into three states namely safe, moderate and severe. According to the machine state, the system alerts the administrator or the user about the status, and then the inference has been fed to the Knowledge base.

Neural networks have a long history that begins with the invention of perceptron by Frank Rosenblatt in 1957 – an artificial neuron that has remained one of the most popular elements of neural networks [4]. Already a small number of perceptrons combined together can learn and solve interesting problems. But neural networks can consist of a large number of artificial neurons. Therefore, neural networks provide a functionality of massively parallel learning and decision-making. Their most distinguished feature is the speed of operation. They are well suited for learning pattern recognition, for classification, for selection of responses to attacks [5] etc. They can be implemented either in hardware or in software. Neural nets are well applicable in intrusion detection and intrusion prevention [6, 7]. They are currently used in DoS detection, computer worm detection, spam detection, zombie detection, malware classification and in forensic investigations [8].



A reason for the popularity of neural networks in cyber defense is their high speed, if implemented in hardware or used in graphic processors it processes faster. Neural networks can permit the exact detection of new malware threats and fill in the dangerous gaps that leave organizations wide open to attacks.

Intelligent Agents :

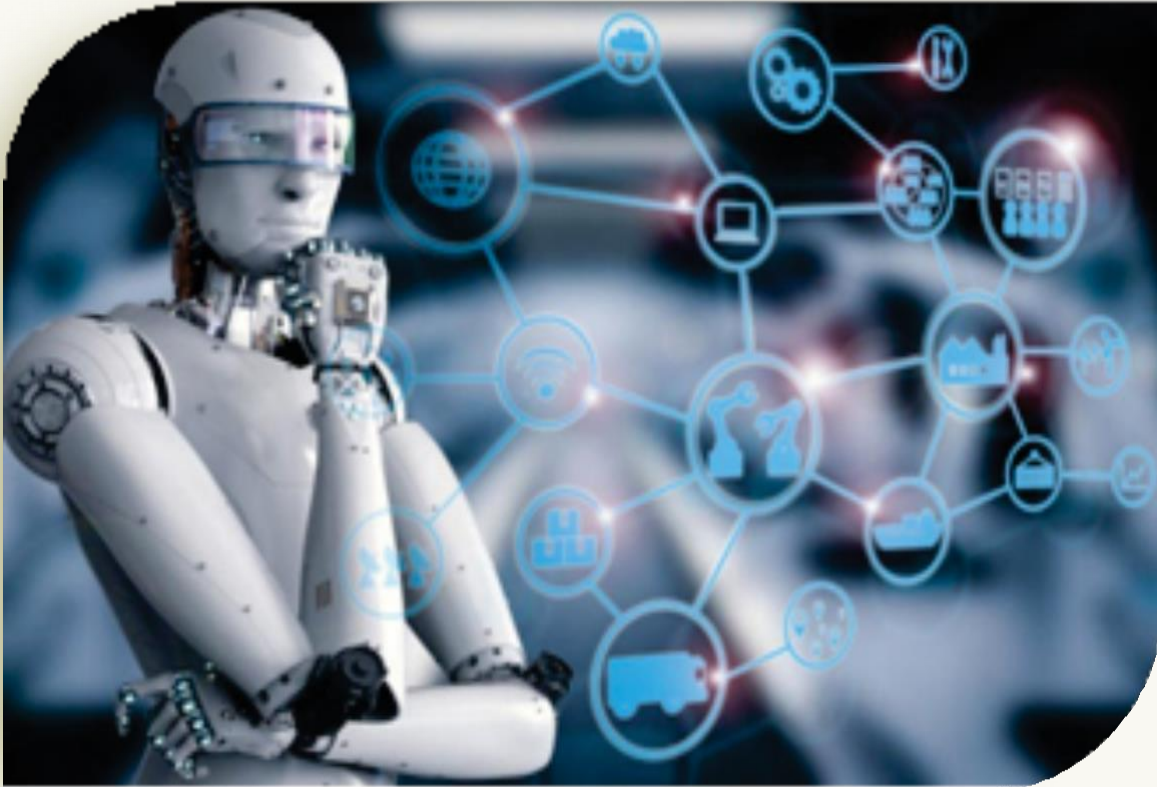
Intelligent Agent (IA) is an independent entity

which recognizes movement through sensors and follows up on an environment using actuators (i.e. it is an agent) and directs its activity towards accomplishing objectives. Intelligent agents may likewise learn or use a knowledge base to accomplish their objectives. They might be extremely simple or very complex. A reflex machine, for example, a thermostat is an intelligent agent. It has behaviors like understanding agent interaction language, pro-activeness and reactivity. They can adapt to real time, learn new things rapidly through communication with the environment, and have memory based standard storage and recovery abilities. Intelligent agent is created in showdown against Distributed Denial of Service (DDoS) attacks [8]. In case if there is any legal or business issue, it should be manageable to develop a "Cyber Police". Cyber Police should have mobile intelligent agents. For this we should devise the infrastructure to support the quality and interaction between the intelligent agents. Multi-agent tools will give a lot of full-fledged operative appearance to the cyber police.

Conclusion :

In the current situation of rapidly growing intelligence of malware and sophistication of cyber attacks, it is unavoidable to develop intelligent cyber defensivemethods[1, 8]. Artificial Intelligence techniques are more flexible and robust than contemporary cyber security solutions. Therefore, increasing security implementation and better defend system from a growing number of advanced and complex cyber threats is important. Regardless of the extreme change that Artificial Intelligence systems has conveyed to the domain of cyber security, related frameworks are not yet ready to alter completely and consequently to changes in their condition.

Though we have many benefits when we use artificial intelligence techniques for cyber security, but it is not the only solution for security. When a human opponent with a clear by-passing goal attacks the intelligent security, the system may fail. This doesn't mean we should not use Artificial Intelligence techniques, but we should know its limits. An Artificial Intelligence technique needs continuous human communication and training. This fusion approach has many confirmed results as it works resourcefully alongside threat researchers



References :

1. Anderson, Frivold, Valdes, "Next- Generation Intrusion Detection Expert System (NIDES)".
2. http://en.wikipedia.org/wiki/Expert_system Expert System. Wikipedia
3. J. Kivimaa, A. Ojamaa, E. Tyugu. Graded Security Expert System. Lecture Notes in Computer Science, v. 5508. Springer, 2009.
4. F. Rosenblatt. The Perceptron -- a perceiving and recognizing automaton. Report 85- 460-1, Cornell Aeronautical Laboratory, 1957.
5. G. Klein, A. Ojamaa, P. Grigorenko, M. Jahnke, E. Tyugu. Enhancing Response Selection in Impact Estimation Approaches. Military Communications and Information Systems Conference (MCC), Wroclaw, Poland, 2010.
6. F. Barika, K. Hadjar, and N. El-Kadhi, "Artificial neural network for mobile IDS solution," in Security and Management, 2009.
7. R.-I. Chang, L.-B. Lai, W.D.Su, J. C. Wang, and J.-S. Kouh, "Intrusion detection by backpropagation neural networks with sample-query and attribute-query," International Journal of Computational Intelligence Research, vol. 3, no. 1, 2007.
8. B. Iftikhar, A. S. Alghamdi, "Application of artificial neural network within the detection of dos attacks", 2009.
9. P. Norvig, S. Russell. "Artificial Intelligence: fashionable Approach", 2000

Generative Adversarial Networks

Prof. Riyazuddin Khan - Assistant Professor

Introduction :

Generative Adversarial Networks, GANs, are an incredible AI technology capable of creating images, sound, and videos that are indistinguishable from the “real thing”. A generative adversarial network (GAN) is a class of **machine learning** frameworks designed by **Ian Goodfellow** and his colleagues in 2014. Two **neural networks** contest with each other in a game. Given a training set, this technique learns to generate new data with the same statistics as the training set. For example, a GAN trained on photographs can generate new photographs that look at least superficially authentic to human observers, having many realistic characteristics. Though originally proposed as a form of **generative model** for **unsupervised learning**, GANs have also proven useful for **semi-supervised learning**, **fully supervised learning**, and **reinforcement learning**.

GAN Architecture :

GANs consist of two parts: generators and discriminators. The generator model produces synthetic examples (e.g., images) from random noise sampled using a distribution, which along with real examples from a training data set are fed to the discriminator, which attempts to distinguish between the two. Both the generator and discriminator improve in their respective abilities until the discriminator is unable to tell the real examples from the synthesized examples with better than the 50% accuracy expected of chance. GANs train in an unsupervised fashion, meaning that they infer the patterns within data sets without reference to known, labelled, or annotated outcomes. Interestingly, the discriminator's work informs that of the generator — every time the discriminator correctly identifies a synthesized work, it tells the generator how to tweak its output so that it might be more realistic in the future.

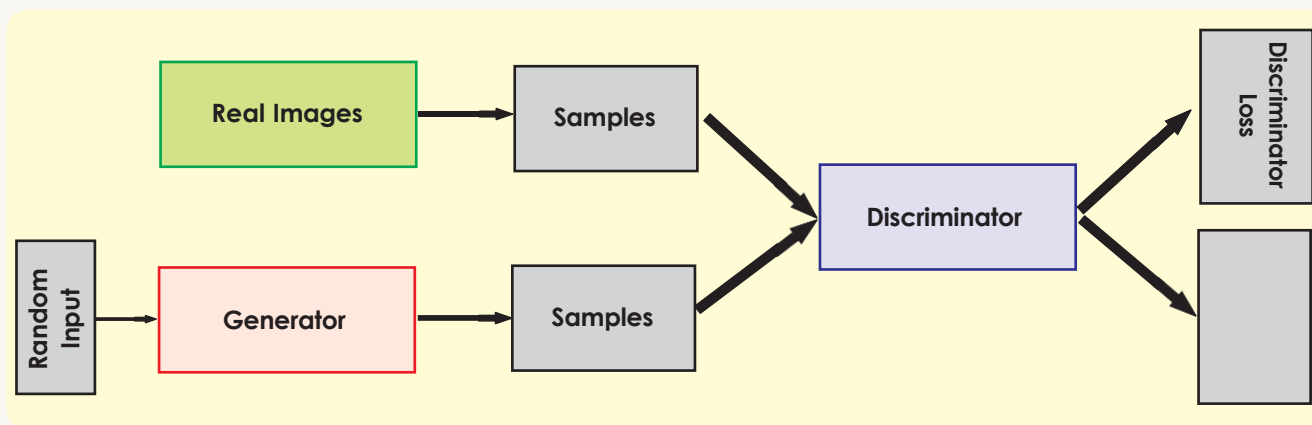


Fig:Generator and Discriminator as GAN building blocks

In practice, GANs suffer from a number of shortcomings owing to their architecture. The simultaneous training of generator and discriminator models is inherently unstable. Sometimes the parameters — the configuration values internal to the models — oscillate or destabilize, which isn't surprising given that after every parameter update, the nature of the optimization problem being solved changes. Alternatively, the generator collapses, and it begins to produce data samples that are largely homogeneous in appearance.

Practical applications of GANs :

Image generation :

Generative networks can be used to generate realistic images after being trained on sample images. For example, if we want to generate new images of dogs, we can train a GAN on thousands of samples of images of dogs. Once the training has finished, the generator network will be able to generate new images that are different from the images in the training set. Image generation is used in marketing, logo generation, entertainment, social media, and so on.



Fig: GAN progress on face generation

Text-to-image synthesis :

Generating images from text descriptions is an interesting use case of GANs. This can be helpful in the film industry, as a GAN is capable of generating new data based on some text that you have made up. In the comic industry, it is possible to automatically generate sequences of a story.






Text description	This is a flower with white petals and purple and white anthers.	The petals of the flower are maroon in colour and have green leaves.	This flower has petals that are pink and has yellow stamen	This flower is pink in colour, and has petals that are curled upward.	This flower is yellow and white in colour, with petals that are pointed at the tips.
DC - GAN					

Fig: Generated images from text description

Face aging:

This can be very useful for both the entertainment and surveillance industries. It is particularly useful for face verification because it means that a company doesn't need to change their security systems as people get older. An age-cGAN network can generate images at different ages, which can then be used to train a robust model for face verification.

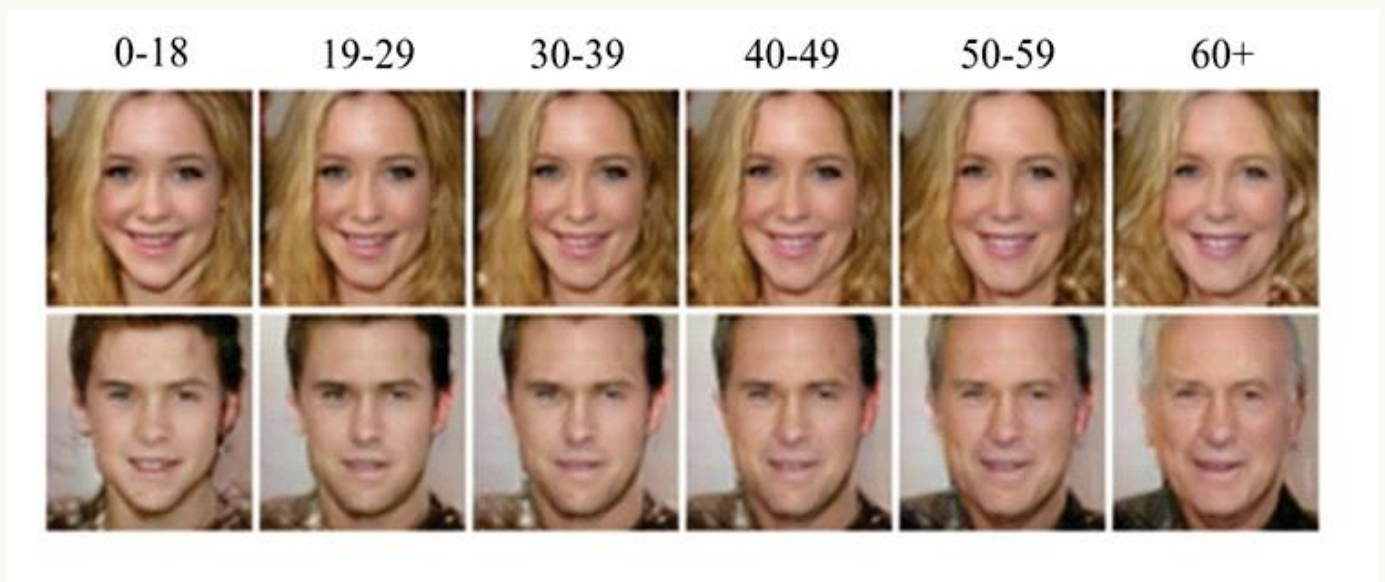


Fig: Generated Images from age-c GAN

Image-to-image translation :

Image-to-image translation can be used to convert images taken in the day to images taken at night, to convert sketches to paintings, to style images to look like Picasso or Van Gogh paintings, to convert aerial images to satellite images automatically, and to convert images of horses to images of zebras. These use cases are ground-breaking because they can save us time.

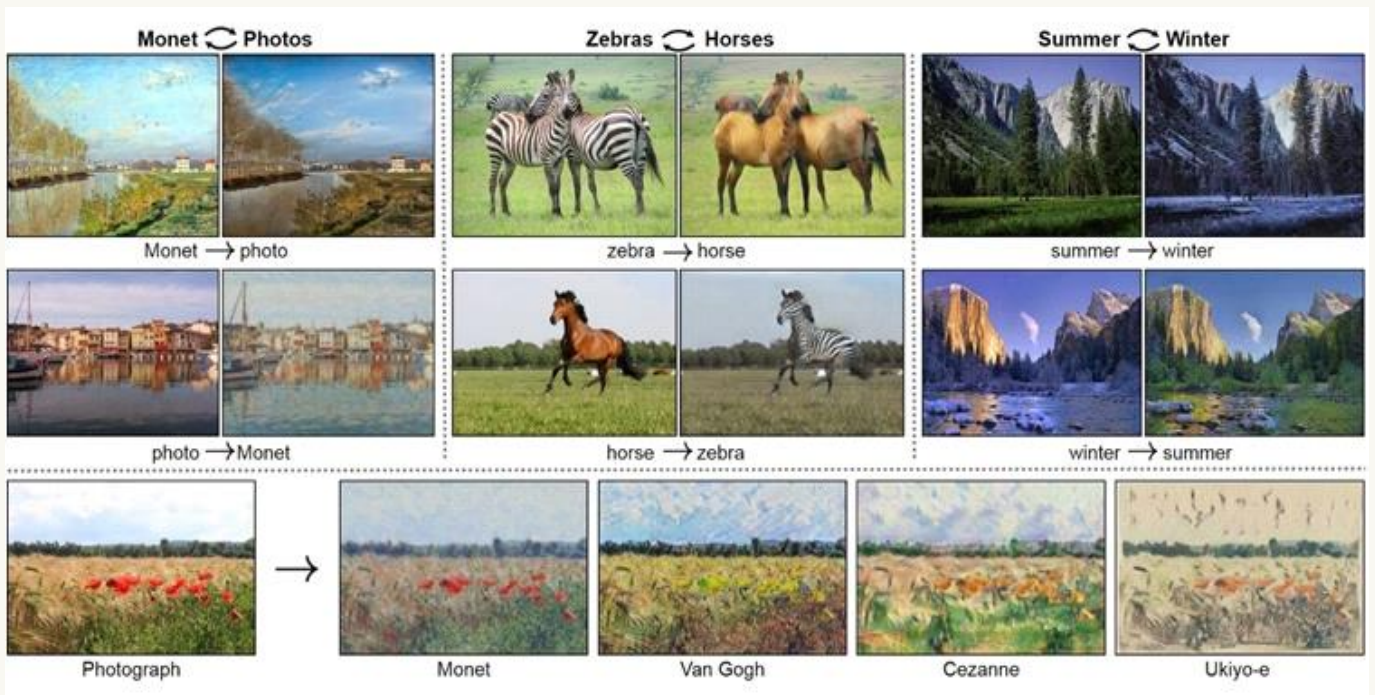


Fig: Unpaired Image-to-Image Translation Using Cycle-Consistent Adversarial Network

Video synthesis :

GANs can also be used to generate videos. They can generate content in less time than if we were to create content manually. They can enhance the productivity of movie creators and also empower hobbyists who want to make creative videos in their free time.



Fig: Example output from the multimodal video synthesis.

High-resolution image generation :

If you have pictures taken from a low-resolution camera, GANs can help you generate high-resolution images without losing any essential details. This can be useful on websites.



Fig:Above: Generated Samples. Below: After Super-Resolution

Completing missing parts of images :

If you have an image that has some missing parts, GANs can help you to recover these sections. Image completion and inpainting are closely related technologies used to fill in missing or corrupted parts of images. There are many ways to do content-aware fill, image completion, and inpainting.

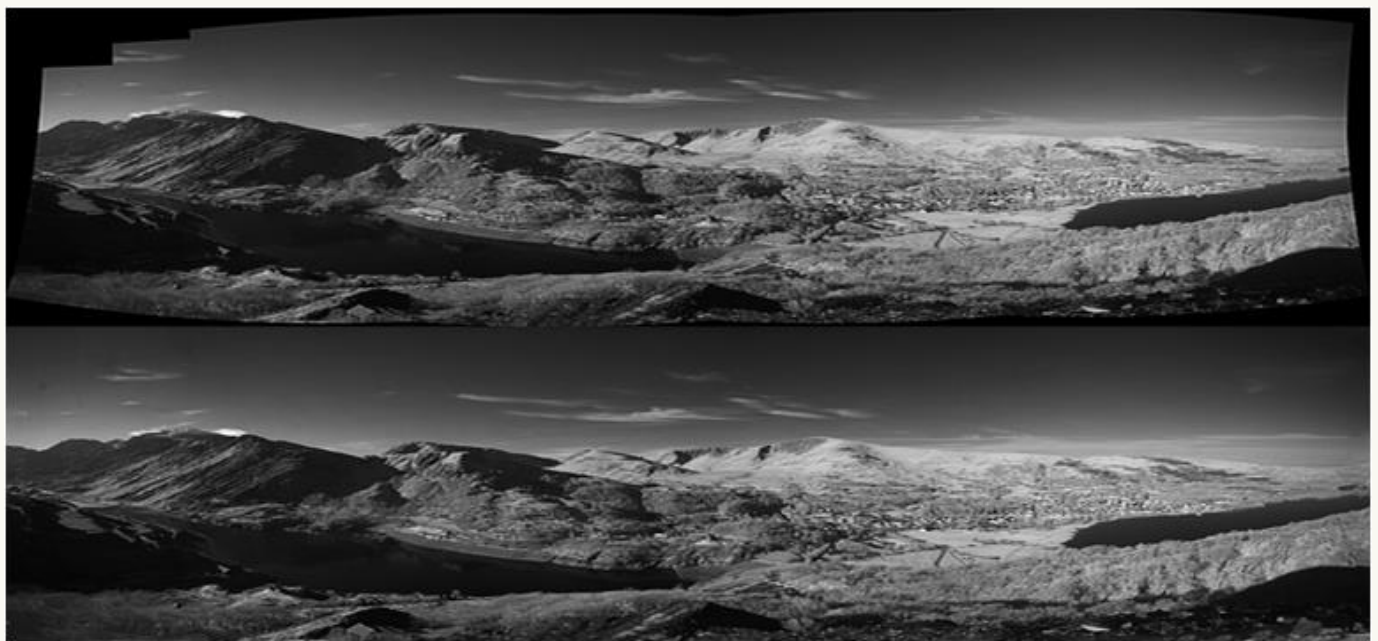


Fig:Example of filling in missing image parts.



Fig: Example of removing unwanted image parts

Variants of GANs :

There are currently thousands of different GANs available and this number is increasing at a phenomenal rate. Six more popular GAN architectures.

1. Deep convolutional generative adversarial networks :

Alec Radford, Luke Metz, and Soumith Chintala proposed deep convolutional GANs (DCGANs). Deep Convolutional Generative Adversarial Networks or DCGANs are the 'image version' of the most fundamental implementation of GANs. This architecture essentially leverages Deep Convolutional Neural Networks to generate images belonging to a given distribution from noisy data using the Generator-Discriminator framework. DCGANs are used to generate anime character faces, Face Aging Using Conditional GANs.

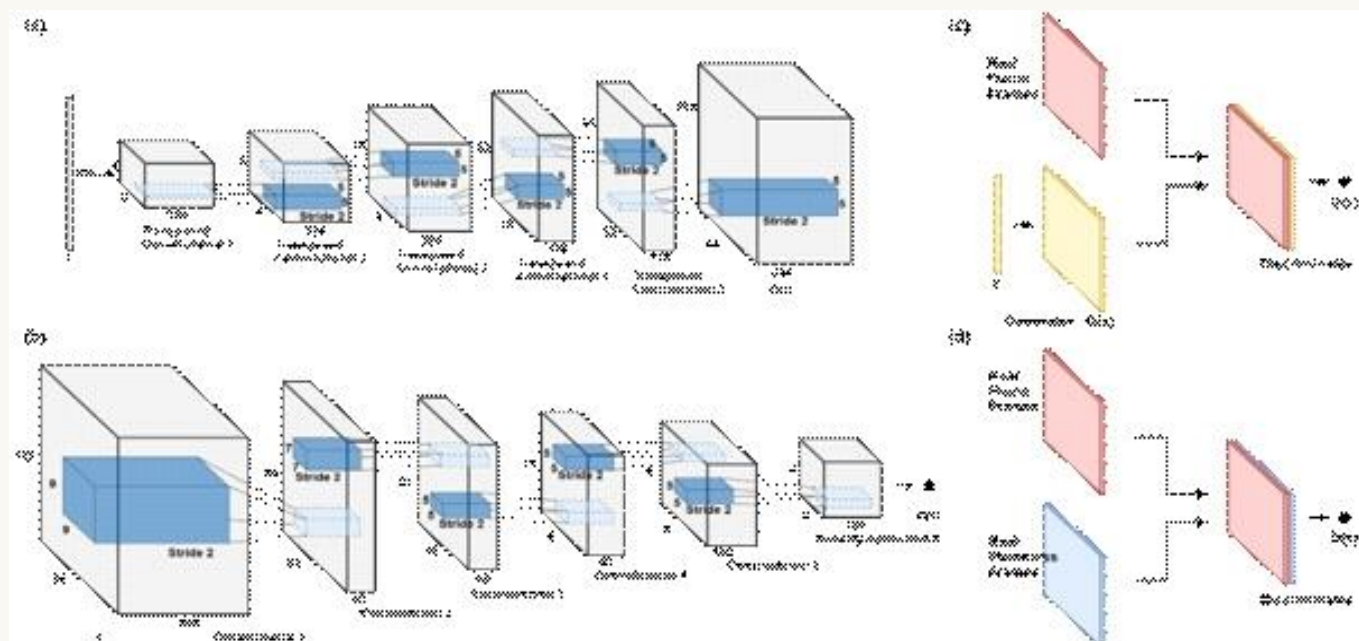


Fig: Deep convolutional generative adversarial networks architecture

2. StackGANs :

StackGANs were proposed by Han Zhang, Tao Xu, Hongsheng Li. They used StackGANs to explore text-to-image synthesis with impressive results. A StackGAN is a pair of networks that generate realistic looking images when provided with a text description. Synthesizing photo-realistic images from text descriptions is a challenging problem in computer vision and has many practical applications.

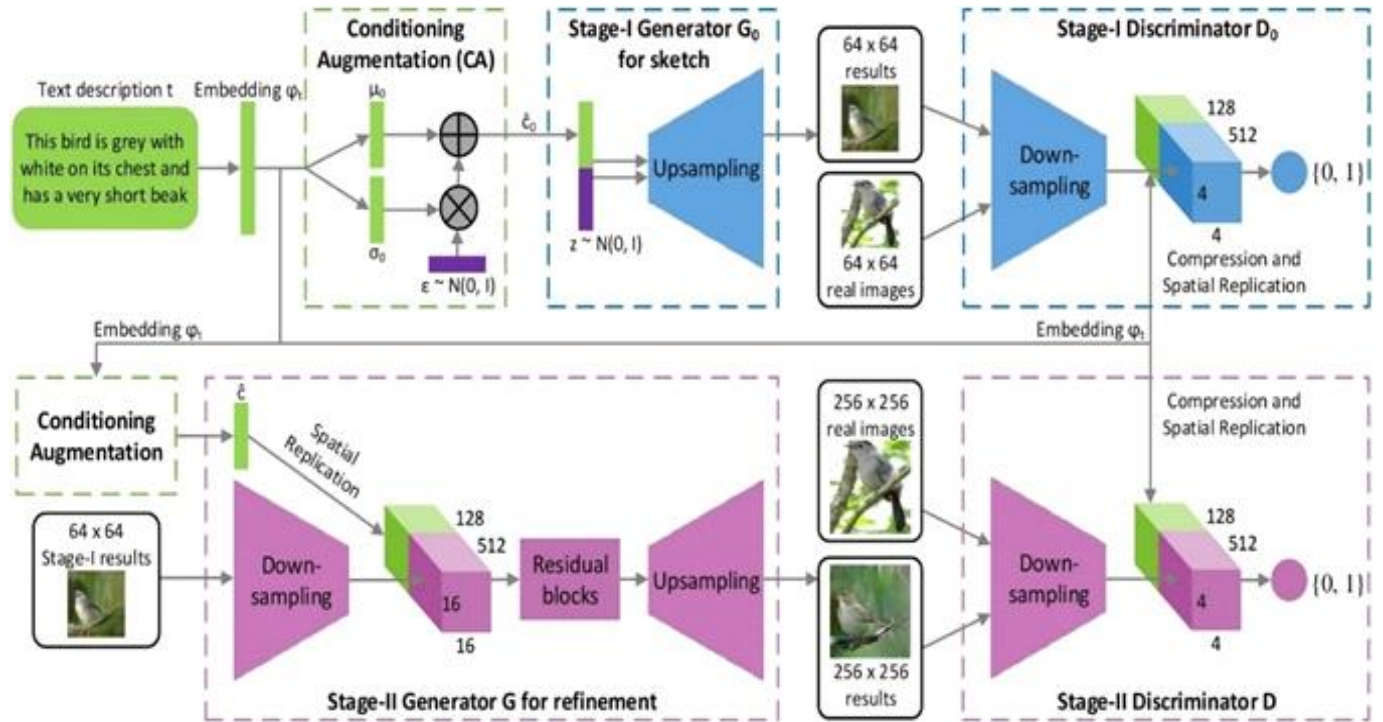


Fig: StackGANs architecture

3. CycleGANs :

CycleGANs were proposed by Jun-Yan Zhu, Taesung Park, Phillip Isola, and Alexei A. Efros. CycleGANs have some really interesting potential uses, such as converting photos to paintings and vice versa, converting a picture taken in summer to a photo taken in winter and vice versa, or converting pictures of horses to pictures of zebras and vice versa.

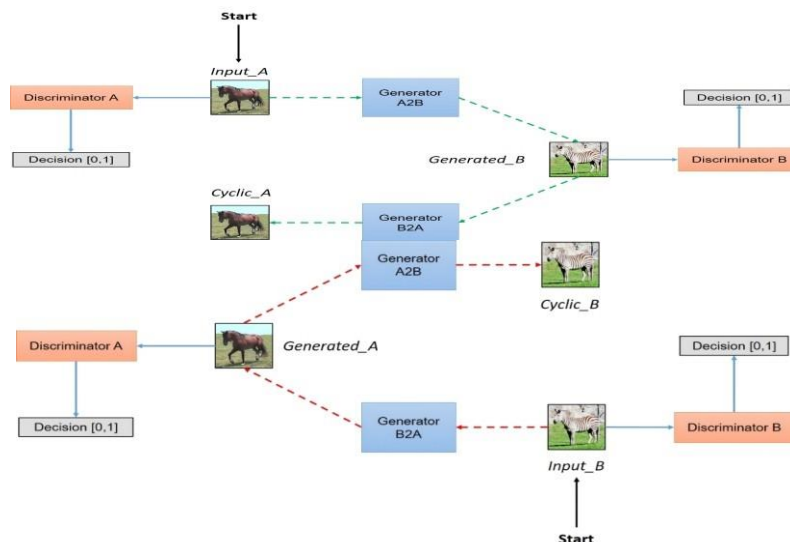


Fig: CycleGANs architecture

4. 3D-GANs :

3D-GANs were proposed by Jiajun Wu, Chengkai Zhang, TianfanXue, William T. Freeman, and Joshua B. Tenenbaum. Generating 3D models of objects has many use cases in manufacturing and the 3D modelling industry. A 3D-GAN network is able to generate new 3D models of different objects, once trained on 3D models of objects.

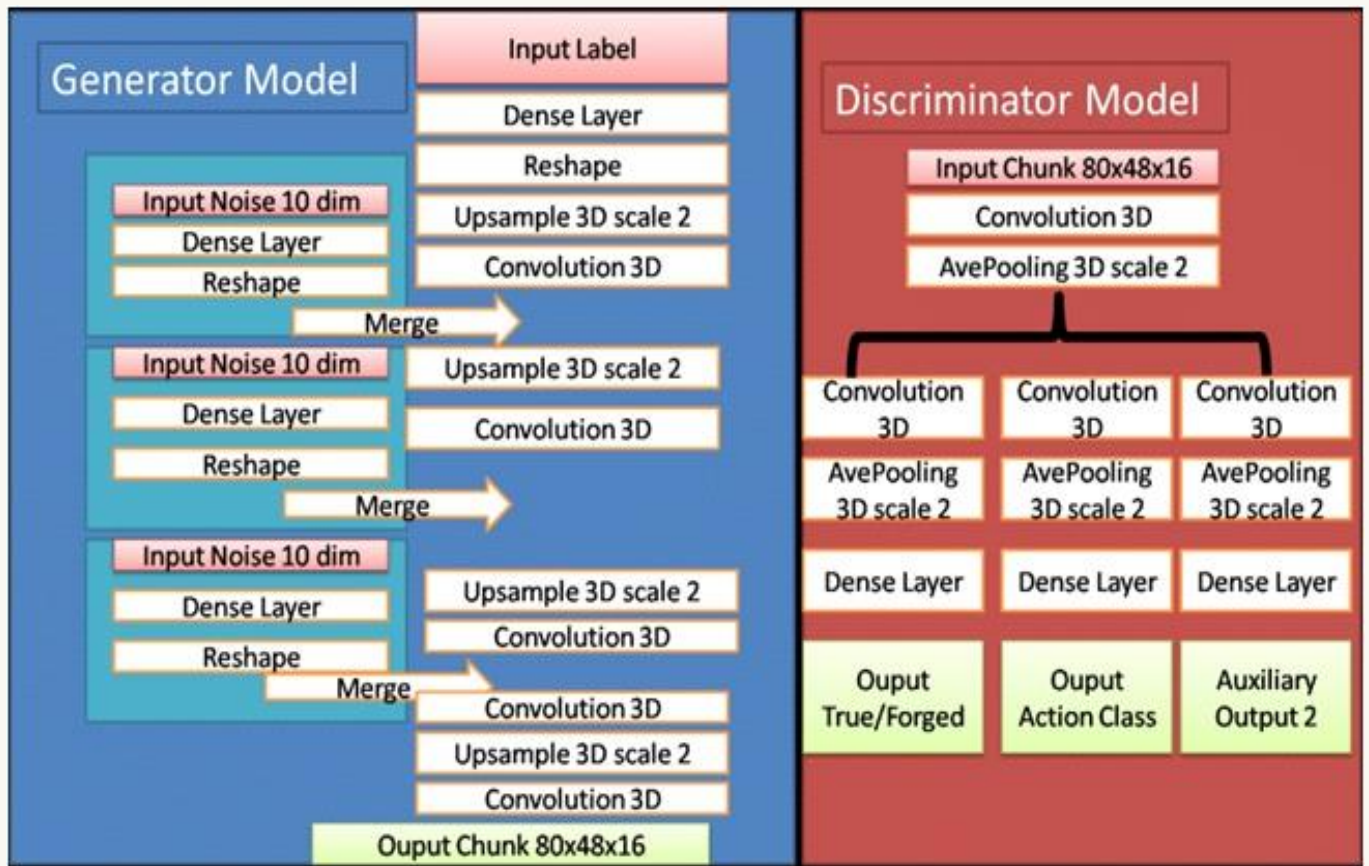


Fig: 3D-GANs architecture

5. Age-cGANs :

Face aging with Conditional GANs was proposed by GrigoryAntipov, MoezBaccouche, and Jean-Luc Dugelay. Face aging has many industry use cases, including cross-age face recognition, finding lost children, and in entertainment.

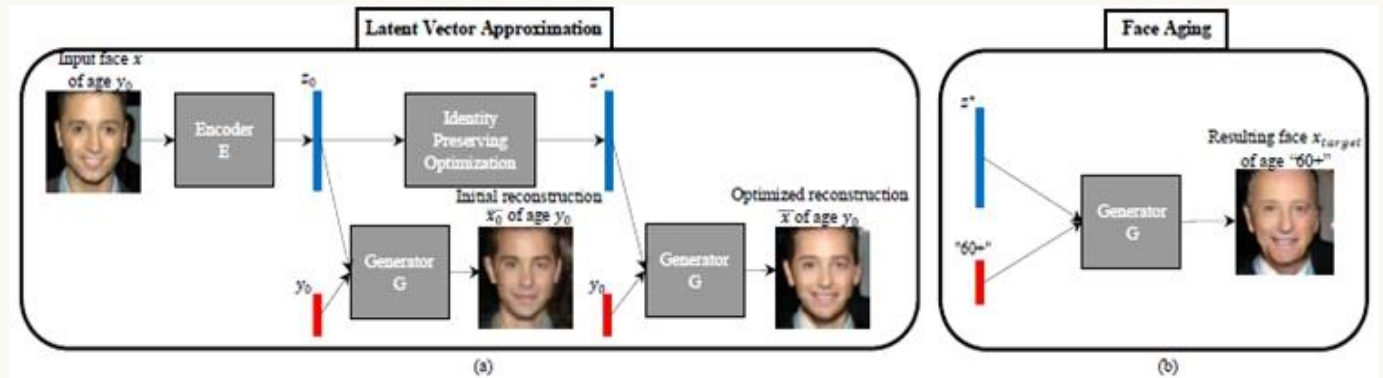


Fig:Age-cGANs architecture

6. pix2pix :

The pix2pix network was introduced by Phillip Isola, Jun-Yan Zhu, Tinghui Zhou, and Alexei A. Efros. The pix2pix network has similar use cases to the CycleGAN network. It can convert building labels to pictures of buildings, black and white images to colour images, images taken in the day to night images, sketches to photos, and aerial images to map-like images. The generator model for the Pix2Pix GAN is implemented as a U-Net. The U-Net model is an encoder-decoder model for image translation where skip connections are used to connect layers in the encoder with corresponding layers in the decoder that have the same sized feature maps

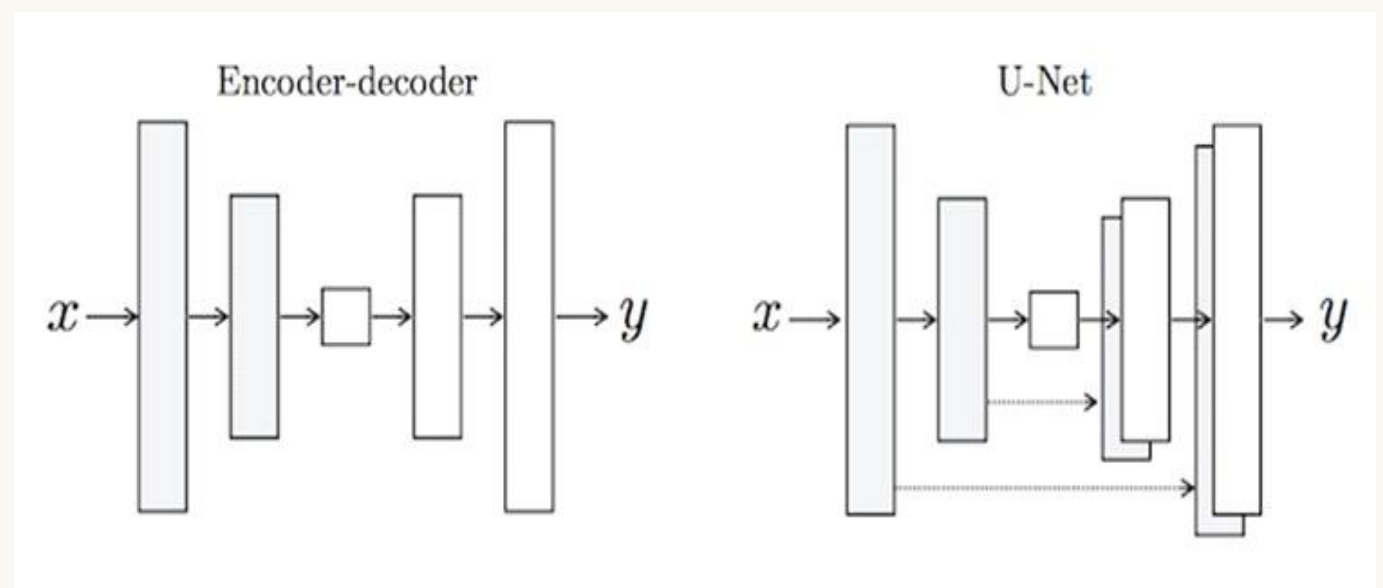


Fig: Depiction of the Encoder-Decoder Generator and U-Net Generator Models. Taken from: Image-to-Image Translation with Conditional Adversarial Networks.

Conclusion :

GANs are a deep learning technique that uses a competitive dynamic between two neural networks to synthesize realistic data samples, such as fake photorealistic imagery. The two networks that constitute, The Generator, whose goal is to fool the Discriminator by producing data indistinguishable from the training dataset. The Discriminator, whose goal is to correctly distinguish between real data coming from the training dataset and the fake data produced by the Generator. GANs have extensive applications across many different sectors, such as fashion, medicine, and cybersecurity.

References :

1. Gentle Introduction to Generative Adversarial Networks (GANs) by Jason Brownlee on June 17, 2019 in Generative Adversarial Networks
2. Original GANs Paper: <https://arxiv.org/abs/1406.2661>
3. DCGAN paper: <https://arxiv.org/abs/1511.06434>
4. GANs Blog: <https://towardsdatascience.com/a-comprehensive-guide-to-generative-adversarial-networks-gans-fcfe65d1cfe4>
5. Unsupervised Representation Learning with Deep Convolutional Generative Adversarial Networks paper: <https://arxiv.org/pdf/1511.06434.pdf>.
6. Han Zhang, Tao Xu, Hongsheng Li, paper StackGAN: Text to Photo-Realistic Image Synthesis with Stacked Generative Adversarial Networks
7. Jun-Yan Zhu, Taesung Park, Phillip Isola, and Alexei A. Efros paper Unpaired Image-to-Image Translation using Cycle-Consistent Adversarial Networks,
8. Jiajun Wu, Chengkai Zhang, TianfanXue, William T. Freeman, and Joshua B. Tenenbaum paper Learning a Probabilistic Latent Space of Object Shapes via 3D Generative-Adversarial Modeling.
9. Face aging with Conditional GANs was proposed by GrigoryAntipov, MoezBaccouche, and Jean-Luc Dugelay paper Face Aging with Conditional Generative Adversarial Networks,
10. Phillip Isola, Jun-Yan Zhu, Tinghui Zhou, and Alexei A. Efros paper Image-to-Image Translation with Conditional Adversarial Networks.

How The Companies Are Using Open Source Software's

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Open-source software :

(OSS) is a computer software with its source code made available and licensed with an open source license in which the copyright holder provides the rights to study, change and distribute the software for free to anyone and for any purpose. Open-source software is very often developed in a public, collaborative manner. Open-source software is the most prominent example of open-source development and often compared to (technically defined) user-generated content or (legally defined) open-content movements.

Open-Source Software is used to represent free software which gives the user unrestricted access to its source code. Open source is a software development methodology that makes source code available to a large community who participate in the development by following flexible processes and communicating via the Internet.

The use of free and open source software is gaining momentum due to the ever increasing availability and use of the Internet. Organizations are also now adopting open source software, despite some reservations in particular regarding the provision and availability of support. One of the greatest concerns about free and open source software is the availability of post release support and the handling of for support. A common belief is that there is no appropriate support available for this class of software, while an alternative argument is that due to the active involvement of Internet users in online forums, there is in fact a large resource available that communicates and manages the management of support requests. The research model of this empirical investigation establishes and studies the relationship between open source software support requests and online public forums. The results of this empirical study provide evidence about the realities of support that is present in open source software projects. We used a dataset consisting of 616 open source software projects covering a broad range of categories in this investigation. The results show that online forums play a significant role in managing support requests in open source software, thus becoming a major source of assistance in maintenance of the open source projects

With open-source software, generally anyone is allowed to create modifications of it, port it is new to operating systems and processor architectures, share it with others or, in some cases, market it. There are several reasons to be pointed out and several policy-based reasons for adoption of open source – in particular, the heightened value proposition from open source (when compared to most proprietary formats)

- ☆ **Security**
- ☆ **Affordability**
- ☆ **Transparency**
- ☆ **Perpetuity**
- ☆ **Interoperability**
- ☆ **Flexibility**
- ☆ **Localization—particularly in the context of local governments (who make software decisions).**
- ✪ Casson and Ryan argue that "governments have an inherent responsibility and fiduciary duty to taxpayers" which includes the careful analysis of these factors when deciding to purchase proprietary software or implement an open-source option.

Today companies are Authors initially derive a right to grant a license to the work based on the legal theory that upon creation of a work the author owns the copyright in that work. What the author/licensor is granting when they grant a license to copy, modify and redistribute their work is the right to use the author's copyrights. The author still retains ownership of those copyrights, the licensee simply is allowed to use those rights, as granted in the license, so long as they maintain the obligations of the license. The author does have the option to sell/assign, versus license, their exclusive right to the copyrights to their work; whereupon the new owner/assignee controls the copyrights. The ownership of the copyright (the "rights") is separate and distinct from the ownership of the work (the "thing") – a person can own a copy of a piece of code (or a copy of a book) without the rights to copy, modify or redistribute copies of it.

So today free and open source software (FOSS) is gaining in its share of the software market as the quality of the projects grow and users move away from commercial software. Indeed even organizations despite some concerns about quality have been using this type of software for variety of purposes. The objective of this study was to analyse empirically the association between managing support requests OSS projects and the online public forums associated with a given OSS project. We observed that online forums are the corner stone of managing support requests in OSS. The management of such requests from inception, through investigation to closure is communicated via online forums. This study further helps in understanding the significant role of online forums in OSS development. We are currently working on a prediction model to predict the new feature requests in an OSS project based on the active involvement of the online community associated with the projects.

Brain Gate

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Introduction:

Our human brain is still an area to be explored. It is still a mystery how it works and how well we can use it. It is a known fact that all of us are not exploiting the complete potentiality of our brain. With the endorsement of technology we can use our brain substantially in the field of communication. Brain is the region where all thoughts are born. Most of us have a problem to deliver those thoughts to others. Some people suffer from motor impairment which is the partial or total loss of function of a body part. This may result in muscle weakness, poor stamina, lack of muscle control, or total paralysis. These are often stroke victims whose perfectly healthy minds end up trapped inside bodies that are immobile. Artificial limbs, wheel chair and other such devices serve as a boon to motor impaired patients.

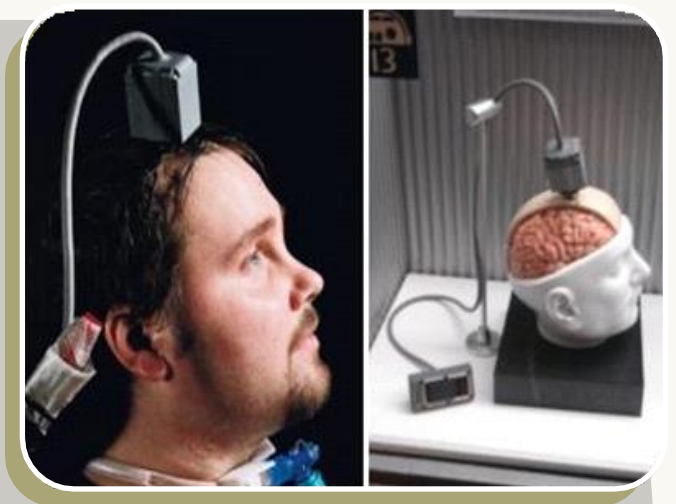
Working Of Brain Gate :

The detection of the input from the user and then translating it into an action could be considered as key part of any BCI system. This detection means to try to find out these mental tasks from the EEG signal. It can be done in time-domain, e.g. by comparing amplitudes of the EEG and in frequency-domain. This involves usually digital signal processing for sampling and band pass filtering the signal, then calculating these time -or frequency domain features and then classifying them.

These classification algorithms include simple comparison of amplitudes linear and non- linear equations and artificial neural networks.

Hardware AndSoftware Behind Brain :

The system consists of a sensor (a device implanted in the brain that records signals directly related to imagined limb movement); a decoder (a set of computers and embedded software that turns the brain signals into a useful command for an external device); and, the external device which could be a standard computer desktop or other communication device, a powered wheelchair, a prosthetic or robotic limb, or, in the future, a functional electrical stimulation device that can move paralyzed limbs directly. Following are the hardware components used in Brain Gate System:



A 4-millimeter square silicon chip studded with 100 hair-thin, microelectrodes is embedded in brain primary motor cortex. The chip, about the size of a baby aspirin, contains 100 electrode sensors, each thinner than a human hair. The sensors detect tiny electrical signals generated when a user imagines. Though paralyzed, a quadriplegic still has the ability to generate such signals — they just don't get past the damaged portion of the spinal cord. With Brain Gate, the signals travel through a wire that comes out of the skull and connects to a computer.

2. THE CONNECTOR :

It is attached firmly to the skull of the patient and it passes the signals received by the chip to the converter. Most handicapped people are satisfied if they can get a rudimentary connection to the outside world. Brain Gate enables them to achieve far more than that. By controlling the computer cursor, patients can access Internet information, TV entertainment, and control lights and appliances with just their thoughts.

3. THE CONVERTER :

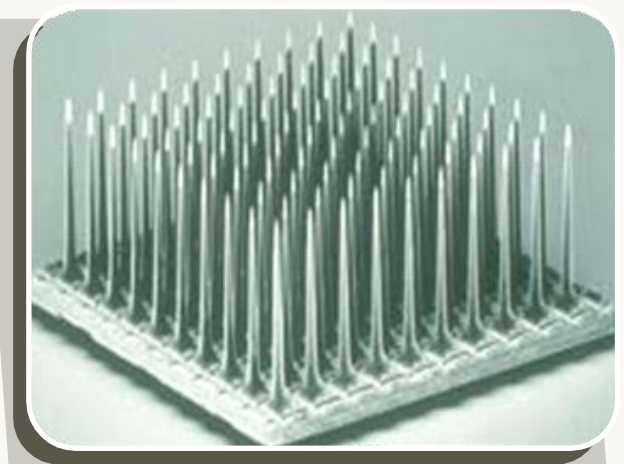
The signal travels to a shoebox-sized amplifier where it's converted to Digital data and bounced by fiber-optic cable to a computer

4. THE COMPUTER :

Brain Gate learns to associate patterns of brain activity with particular imagined movements – up, down, left, right– and to connect those movements to a cursor. A brain-computer interface uses electrophysiological signals to control remote devices. They consist of electrodes applied to the scalp of an individual. These electrodes pick up the signals and carry it into amplifier that amplify the signal approximately ten thousand times and then pass the signal via an analog to digital converter to a computer for processing. The computer processes the Electroencephalography (EEG) signal and uses it in order to accomplish tasks such as communication and environmental control. BCIs are slow in comparison with normal human actions, because of the complexity and noisiness of the signals used, as well as the time necessary to complete recognition and signal processing. Software behind Brain Gate System uses algorithms and pattern-matching techniques to facilitate communication. The algorithms are written in C, JAVA and MATLAB. Signal processing software algorithms analyze the electrical activity of neurons and translate it into control signals for use in various computer-based applications.

Applications:

Brain gate technology can be used for controlling remote devices. This system can be used for making and receiving telephone calls and accessing the internet. Control over the robotic arm is another widely used application of the system. It helps the motor impaired patients to watch and control television, use the pc, locking or unlocking doors. It assists them to use their motorized wheelchair without any external help



Conclusion :

The concept of mobile robots or prosthetic devices not by manual control, but by mere thinking (i.e., the brain activity of human subjects) has been a fascinated approach. Medical cures are unavailable for many forms of neural and muscular paralysis. The enormity of the deficits caused by paralysis is a strong motivation to pursue BMI solutions. So this idea helps many patients to control the prosthetic devices of their own by simply thinking about the task. Medical cures are unavailable for many forms of neural and muscular paralysis. The enormity of the deficits caused by paralysis is a strong motivation to pursue BMI solutions. So this idea helps many patients to control the prosthetic devices of their own by simply thinking about the task.

Reference :

- ☆ Braingate.org
- ☆ <https://en.wikipedia.org/wiki/BrainGate>
- ☆ http://www.cyberkinetics.com/what_is_braingate.html

Driver Assistance System – DAS

SAGAR MOHANTY -1921322093

SANKAR PATRA- 1801322155

Vehicles and drivers reach new safety levels using Driver assistance system - DAS. Safety systems were once only backup cameras and parking assistance. Now, they are being fused with other subsystems and integrated with new technology to provide life-saving features like emergency braking. As these systems are used in more and more safety-critical applications, the testing to ensure they function properly needs to become more rigorous and simultaneously support the rapid innovation that is happening.

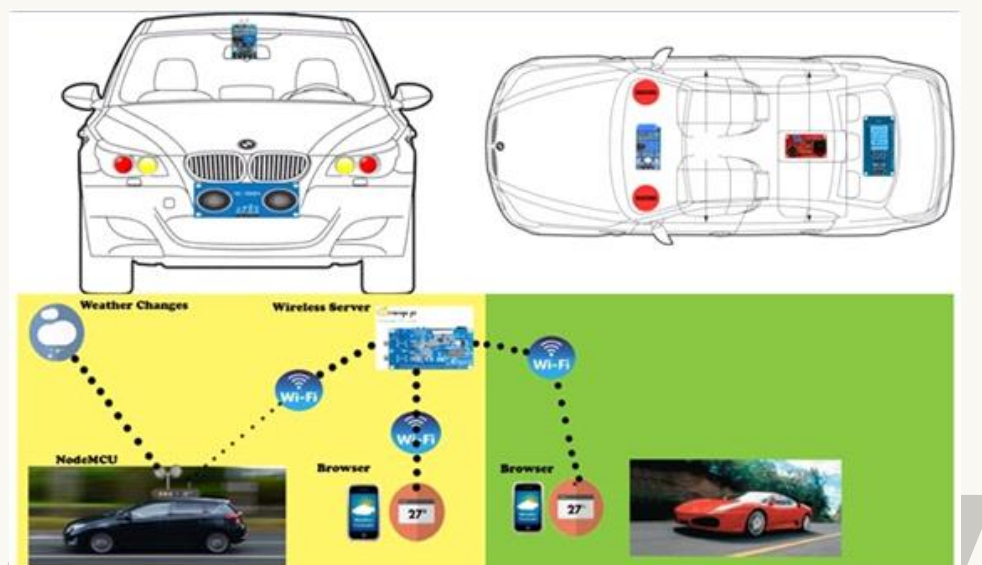
Demand for Automated Driver Assistance Systems (ADAS) is caused by desire to build safer vehicles and roads in order to reduce the number of road fatalities and by legislation in the leading countries. ADAS is made of the following physical sensors: radar, LIDAR, ultrasonic, photonic mixer device (PMD), cameras, and night vision devices—that allow a vehicle to monitor near and far fields in every direction and of evolving and improving sensor fusion algorithms that ensure vehicle, driver, passenger's, and pedestrian's safety based on factors such as traffic, weather, dangerous conditions etc.

Driver assistance system is a system to help the driver in the driving process. DAS is developed to automate/adapt/enhance vehicle systems for safety and better driving. Safety features are designed to avoid collisions and accidents by offering technologies that alert the driver of potential problems, or to avoid collisions by implementing safeguards and taking over control of the vehicle. Adaptive features include automated lighting, theft alarm, warning during over speeding, temperature and humidity information, connection to smartphones, alert driver of other cars or dangers and indicate obstacles in blind spots while backing. In addition to the above functionalities a simulated digital weather system which provides the information of the weather in the neighbouring environment is also provided. For example, it can provide the details about the surrounding temperature, barometric pressure, humidity, etc. By knowing the weather situations ahead of the journey, one can know what precautions need to be taken.

DAS has been simulated using a small toy car. Two breadboards have been attached, each of which have three sensors and these sensors collect the data depending upon the car's behaviour when it is put through some tests. The digital weather station has also been simulated and it provides the details of the weather at the destination in the mobile. These details are stored into a server (orange pi) on which more operations can be done. The sensors that are attached to the breadboard do the following functions:

1. An Ultrasonic sensor gives out an alarm if there is any obstacle while backing the car.
2. A theft alarm goes off as a security measure, in case anyone tries to break the glass of the car.
3. There is a sound alarm to indicate that the car is over speeding, and is done using a vibration cum tilt sensor.
4. A light sensor automatically switches on the head lights of the car when in dark.
5. When any vehicle or obstacle is too close to the front of the car additional headlights are automatically switched on.
6. A temperature and humidity sensor tells the temperature and humidity surrounding the car at a particular place, which can be viewed in the digital dashboard.
7. In addition, using a server (Orange Pi), the temperatures at various places in the route are known. These temperatures can be viewed well ahead through wireless Lan in the mobile.

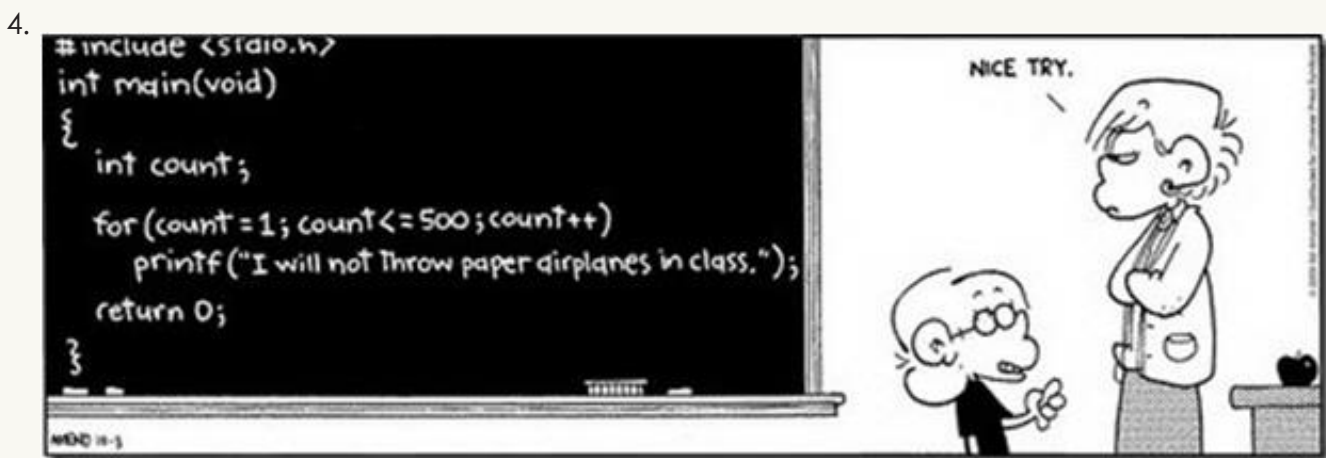
The development of various ADAS systems help in advancing piloted driving. The fusion of sensors plays an increasingly important role here. It is, for instance, already possible for ultrasonic, radar and optical sensors to interconnect, so that they can work together to get a better picture of their surroundings. It has as added value that will come to bear in a wide variety of vehicle features. These features shift more and more responsibility away from people towards technology, with the aim of making driving a safer and more relaxed experience. The concept of Simulation of DAS can be incorporated not only to automate vehicles but also to meet societal needs and in various other applications.



Non Technical Articles

JOKES

1. A young computer science student is on the phone with his father...
His father says: "so how have your classes been going?"
The son replies: "not bad. I did really well on my test on hexadecimal today! It was only worth fifteen points, but I'm still happy about it."
"Oh yeah? What grade did you get?"
"An F!"
2. What's the object-oriented way to become wealthy?
Inheritance.
3. I changed my password to 'incorrect'. So whenever I forget what it is the computer says "Your password is incorrect". (Not advisable!).



Smart Imposition!

CIA : Computer Industry Acronyms

CD-ROM: Consumer Device, Rendered Obsolete in Months

PCMCIA: People Can't Memorize Computer Industry Acronyms

ISDN: It Still Does Nothing

SCSI: System Can't See It

MIPS: Meaningless Indication of Processor Speed

DOS: Defunct Operating System

WINDOWS: Will Install Needless Data On Whole System

OS/2: Obsolete Soon, Too

PnP: Plug and Pray

APPLE: Arrogance Produces Profit-Losing Entity

IBM: I Blame Microsoft

MICROSOFT: Most Intelligent Customers Realize Our Software Only Fools Teenagers

COBOL: Completely Obsolete Business Oriented Language

LISP: Lots of Inspid and Stupid Parentheses

MACINTOSH: Most Applications Crash; If Not, The Operating System Hangs

AAAAA: American Association Against Acronym Abuse.

WYSIWYMGYRRLAAGW: What You See Is What You Might Get If You're Really Really Lucky And All Goes well

Flexible Displays



A **flexible display** is a display which is flexible in nature; differentiable from the more prevalent traditional flat screen displays used in most electronics devices. Colloquially, "display" means the thing you see when you look at your phone and navigate around. But more technically, display refers to the electronic material that sits beneath the glass or plastic cover (the part you actually touch) and is responsible for lighting up your phone.

Companies like LG and Samsung have spent years demoing flexible displays that sit on their own outside of any device. In coming days, companies like Samsung will be launching flurry of new Smartphone's with OLED displays. These displays are flexible and unbreakable and also conserve low battery, making them lot more efficient when compared with older Smartphone models. With this durable and new technology, customers can extend their phone life, and most of them will also be water-resistant.

BABITA KISAN
1801322017

5 Pen PC Technology



NEC Corporation is on the way to invent five pen PC which commonly known as P-ISM i.e. Pen-style Personal Networking Package. The concept of the pen computer was given in 2003. It was featured at ITU Telecom World which took place in Geneva, Switzerland.

Working: Five pens correspond to five functions: a camera, virtual keyboard, CPU, pen with a cellular phone and a projector. The display is an LED projector having A4 size (Approx. 1024X768). It has a virtual keyboard with 3D IR sensor. We have a digital camera used for video recording, video conferencing. The size of the battery is small and can be used for more than 6 days once it is fully charged.

BIBEK SAMAL
1801322029

Google Glass

The emergence of **Google Glass**, a prototype for a transparent Heads-Up Display (HUD) worn over one eye, significant. It is the first conceptualization of a mainstream augmented reality wearable eye display by a large company.

Google Glass is deliberately framed in media as the brainchild of Google co-founder Sergey Brin. The device will probably communicate with mobile phones through Wi-Fi and display contents on the video screen as well as respond to the voice commands of the user. It mainly concentrates on the social networking, navigation and communication.

DEBASISH MOHANTY
1801322051

“THE LAND OF DREAMS – INDIA”

The place where people speaking different languages speak the common language of “Love”. People wearing different clothes are draped in the common cloth of harmony. People with different castes chant the common song of unity. It is the land of dreams – *India*.

It's the land of Lord Shiva and Krishna, the dream of Buddha and Gandhi. And a nursery of temples and mosques well known for spirituality, philosophy, silence and technology.

Farming and Agriculture is the backbone of the country. Beauty of the country lies in its historical monuments.

Geography has also given India a distinct existence. She is only bounded in the north by the mighty Himalayan ranges, in the east, west and south there are the sea and ocean.

Our country is a gem and we should treasure it for our coming generation also.

SATYAJIT BEHERA

180132216

DO IT NOW

Now a day everyone wants to be a successful person in this successful world. This is the very important things that a work you want to do then do it right now.

Why postpone what you can do today to some time off in the distance? Why put off playing your greatest game as a human being to some point in the future? Why delay having a remarkably good time until you is old? Why think that you have sufficient time to do it? Why wait until you are old to love living? If you want to do something then do it right now and get your success.

I think most of the youths have this type of thinking. I don't say that they haven't ability to do the work, they have much more ability to do. And I am in no way to suggesting that you neglect the importance of planning for your future. Take the long view and prepare for a full life. As always, it's a balance. Do your plans. But at the same time, live in the moment. Play full out. Take daily risk. Be smart.

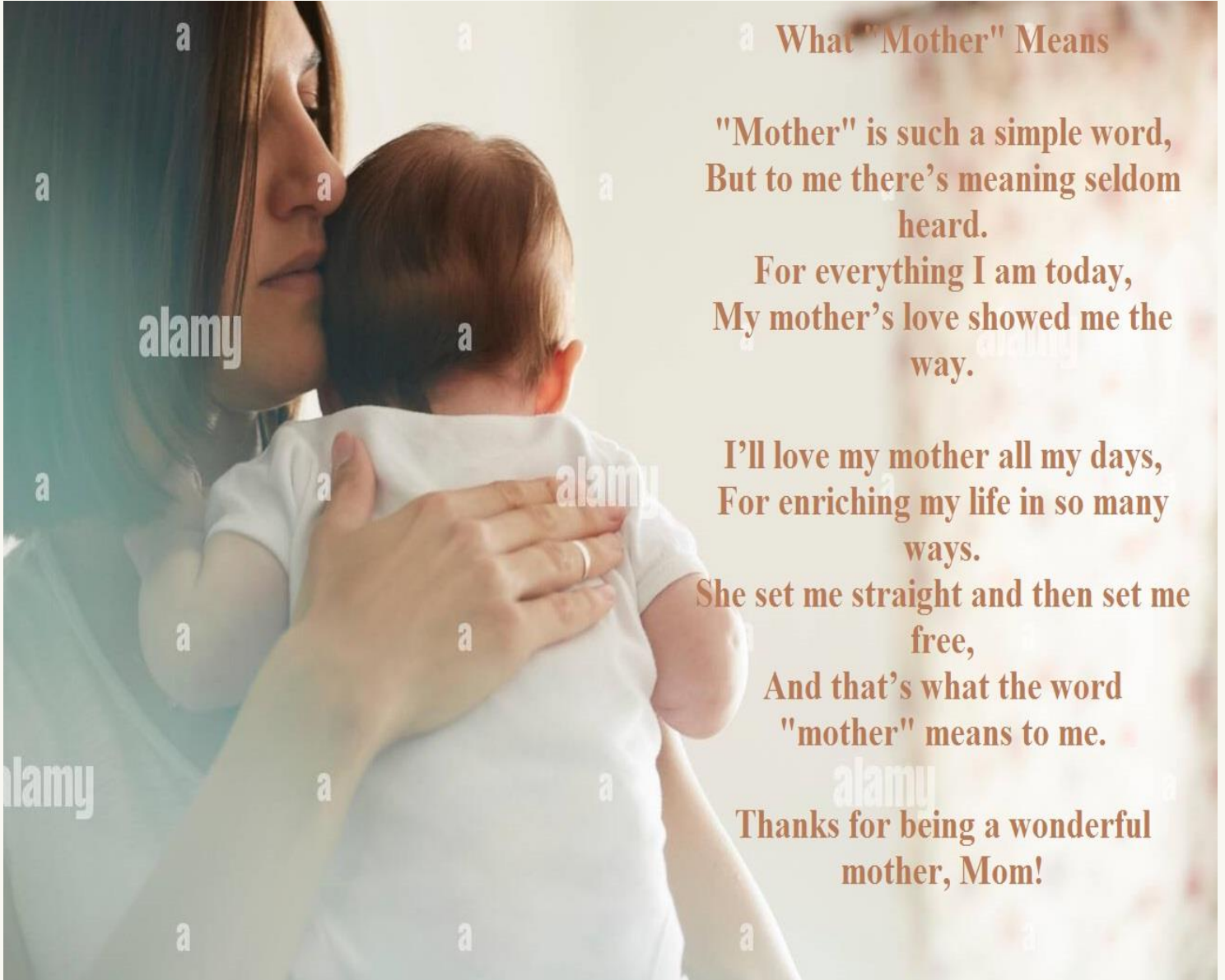
So fill your days with colour of success. Laugh a lot. Love a lot. Dream a lot. And there is a question for you that

“When was the last time you did something for the first time?”

SANKAR PATRA

1801322155

Student Poetry



What "Mother" Means

"Mother" is such a simple word,
But to me there's meaning seldom
heard.

For everything I am today,
My mother's love showed me the
way.

I'll love my mother all my days,
For enriching my life in so many
ways.

She set me straight and then set me
free,

And that's what the word
"mother" means to me.

Thanks for being a wonderful
mother, Mom!

SUVANI MOHAPATRA
1901322115



Childhood Friends

As childhood friends, we grew up together,
Swearing to be friends forever and ever.
Sometimes we would argue and fight,
Other times we would laugh and stay up all night.

We went from playing with games and toys,
To talking and dreaming about different boys.
My thoughts and feelings, to you I would confide,
Never having anything to hide.

Friends we do remain,
Things changing, and things staying the same.
To each other we still listen and share,
About each other, we will always care.

SUBHASHREE SUBHADARSHINEE

1901322110

शाश्वत सत्य

उद्दीप्त जीवन अंकुरण
प्रकृति का अनंत सहचर
नश्वर अविनाशी क्षण भंगुर
आत्मोत्सर्ग स्थूल अस्तित्व क्षरण
क्या यही सत्य है,
क्या यही मर्म है,
बाल्य किशोर युवा प्रौढ़ क्रमिक चक्र
काल समय दिन माह वर्षों में जीवन वक्र
छूट गये इस अनन्त यात्रा में
कितने स्मरण ,प्रेम ,अनुराग, सम्पर्ण, त्याग
जीवन का राग प्रियजन...
प्रकृति का शाश्वत नियम
उत्थान पतन ,उदय अस्त
क्षितिज के इस छोर से उस छोर तक
दुख के सागर में गोते लगाते मानवीय स्पर्श
क्या कोई संतुष्ट हो पाया,
क्या कोई अमरत्व को पाया...
क्षीण जीवन प्रत्याशा के इर्दगिर्द
अपारगम्य यात्रा की ओर बढ़ते कदम
न विराम, न अवसान
शून्य से अनन्त तक
जन्म से मरण तक अविराम यात्रा...
अनन्त इच्छाएँ ,
जीवन की सार्थक अभिव्यक्ति...

JYOTI KUMURA
1801322077

Sketch



BUSHBUNIAN MANDAL
1801322044

DINABANDHU BINDHANI
1801322056





SWADHIN SAMANTARA
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SONAM SETHI
1901322106





PRITEE JENA
1901322085

MOUSUMI MAHANANDIA
1901322080





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