WIE GAZETTE

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INDEX

THEME- DEEP LEARNING

Deep Learning is a subset of Machine Learning. It is concerned with algorithms inspired by the functioning of the human brain and this is referred to as artificial neural networks. This class of machine learning algorithms uses numerous layers to extract high-level features from raw input. It has proved to be a pivotal key in developing many devices whose inner mechanisms work very similar to human neural processes. Discover the intricacies and minutiae of Deep Learning with the March Edition of The WIE Gazette, as it talks about the incredible complexities of this neurological part of Machine Learning.

GLOSSARY

1. **Activation Function**
   Allowing Neural Networks to learn complex decision boundaries by applying nonlinear activation functions to their layers.

2. **Backpropagation**
   It is an algorithm used for the efficient calculation of gradients in a Neural Network or a feedforward computational graph.

3. **Batch Normalization**
   It is a technique used to normalize input layers per mini-batches. It increases training time and allows for higher learner rates.

4. **Categorical Cross-Entropy Loss**
   It is a loss function for categorization problems and measures the similarity between two probability distributions, typically the true labels and the predicted labels.

5. **Exploding Gradient Problem**
   The inclination for gradients in deep neural networks to become very steep, resulting in very large updates to the weights of each node in a deep neural network.

6. **Fine-Tuning**
   Fine-Tuning refers to the technique of performing a secondary optimization for adjusting the parameters of an already trained model to fit a new problem.

7. **Keras**
   Kears is a popular Python-based Deep Learning library that runs on several deep learning frameworks.

8. **Momentum**
   It is an extension to the Gradient Descent Algorithm in which a learning step depends not only on the derivative in the current step but also on the derivatives of the step(s) that immediately preceded it.

9. **Softmax**
   It is a function that is used to convert a vector of raw scores into class probabilities at the output layer of a Neural Network used for classification. It provides probabilities for each possible class in a **multi-class classification model**.

10. **TensorFlow**
    TensorFlow is a large-scale, open-source C++/Python machine learning platform. Created by Google, the software library is used for numerical computation using data flow graphs, particularly Deep Neural Networks.

HEADLINES

Deep learning has steadily been gaining popularity over the past few years. Though Machine learning, the superset of deep learning is quite popular, Deep learning is making good progress in the field of technology as well. So much so that a lot of features on our social media handle such as face filters and image recognition have become possible only due to deep learning. With such a huge potential to produce wonders and accuracy which was predicted to be unachievable at some point, it is extremely essential that we keep ourselves up-to-date with the current trends. Here are the two trends in deep learning which are doing the rounds in the technological markets for its profound benefits.

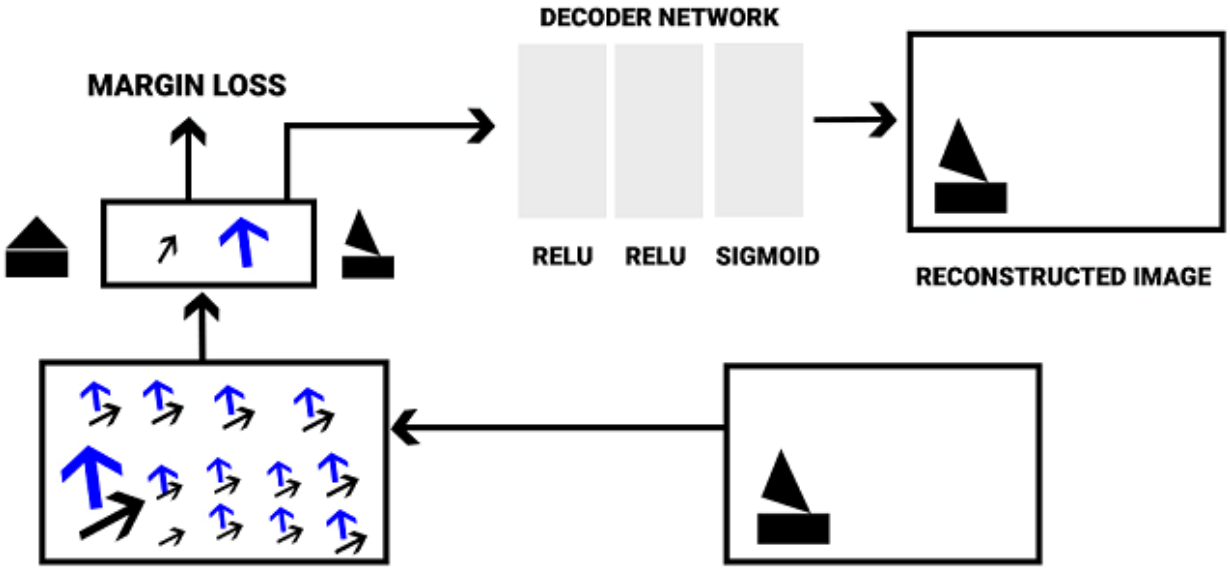


Image from Intel Developer Zone

Capsule Networks:

Convolutional neural networks (CNN) have been utilised tremendously to work with image data. However, it was observed that the accuracy provided by CNN wasn't up to the mark. This drawback arose due to the fact that CNN failed to comprehend spatial hierarchies between various features of data as it made use of scalars. This gave rise to results that were good but not excellent. To overcome this limitation, Capsule networks were introduced. Capsule networks represent a class of deep neural networks. The fundamental working of capsule networks is by establishing a hierarchical relationship between the various features. Capsule networks use vectors which model the relationship between numerous features of data in a hierarchical order.

Deep reinforcement learning:

It combines AI-driven neural networks with reinforced learning to derive the results using software agents. A prominent example of it, which took the internet by storm was AlphaGo, an algorithm which beat champions across the globe at the Go board game . The working model is quite simple to understand but excruciatingly difficult to implement. Deep reinforcement learning uses the input fed by the user to predict the results which would occur later. This is possible by virtue of efficient reinforcement algorithms designed to predict the likelihood of outcomes based on current information. Since algorithms will only get better and better in the future, the accuracy and precision of deep reinforcement learning are only going to improve. Hence, it will play a crucial role in enhancing deep learning.

It must be noted that these two trends provide only a fraction of the insights which we will gain in the future. Deep learning has a lot in store for us and will overcome hurdles that once seemed insuperable.

TIMELINE

The Evolution of Deep Learning

- 1943-The development of the first neural network mathematical model was developed and for machine and deep learning to work, we needed an established understanding of the neural networks of the human brain.
- 1950- The prediction of machine learning was made.
- 1952- The phrase “machine learning” was coined and the first machine learning programs were invented.
- 1957- The foundation for deep neural networks was set.
- 1960- Control Theory was proposed by Henry J. Kelley and many of his ideas were applied directly to AI and ANNs (Artificial Neural Networks).
- 1965-The first working deep learning network was created.
- 1980- The ANN learned how to recognize visual patterns.
- 1982- Hopfield Networks, a recurrent neural network was created. It is used as a popular implementation tool for deep learning in the 21st century.
- 1985- A program learned how to pronounce English words in much the same way a person does.
- 1986- Vast improvements in existing neural networks for many tasks such as word prediction, shape recognition, and more were made.
- 1989- Machines were developed to read handwritten digits.
- 1993- A deep learning task was solved and this was a huge leap forward in the complexity and ability of neural networks.
- 1995- Support Vector Machines (SMVs) were designed. SMVs are systems made for recognising and mapping similar data and relates to deep learning.
- 1997- A recurrent neural network framework, long short-term memory (LSTM) was proposed. It improves both the efficiency and practicality of recurrent neural networks.
- 1998- Gradient-Based Learning was yet another advancement in the field of deep learning. It was a preferred and increasingly successful approach to deep learning.
- 2000- The problem of “Vanishing Gradient Problem” had occurred. The features formed in the lower layers were not being reached to the upper layers.
- 2001- A call to prepare the onslaught of Big Data was made.
- 2009- ImageNet was launched. It is a large and free database of labelled data that is needed to train neural nets in supervised learning.
- 2011-AlexNet was created and it kicked off a convolution neural network renaissance in the deep learning community.
- 2012-The Cat experiment was performed. Using a neural network spread over thousands of computers, the system was presented with several unlabelled images and allowed it to run analyses on the data. Once the learning session was complete, the program had taught itself to identify and recognize cats.
- 2014-
    - Facebook’s deep learning system called DeepFace was developed which uses neural networks to identify faces with 97.35% accuracy.
    - The Generative Adversarial Networks (GAN) are the most interesting development in deep learning. It enables model to tackle unsupervised learning.
- 2016- Many powerful machine learning products are being offered and Deepmind’s deep learning model beats human in the complex game of Go.
- 2018-
    - The way we think about deep learning architectures was changed by self-attention. ‘Attention’ is basically a probability distribution over the input that tells the model what to focus on and what not to.
    - Neural networks became increasingly meta.
- 2019- BigGAN scales up Generative Adversarial Networks which allows you to generate new visuals, being trained on huge visual databases.
- 2020-
    - OpenAI announced PyTorch as its standard Deep Learning framework.
    - A ground-breaking model was published in Nature Machine Intelligence

BLOG

Regina Barzilay:

As the technical industry wrestles with getting women to work in this field, some extraordinary women made their way to the highest level of the corporate ladder. One exemplary woman who broke all barriers coming in her way and successfully contributed to society is Regina Barzilay. Regina Barzilay is an Israeli-American computer scientist, Delta Electronics Professor of Applied Science and Engineering at the Massachusetts Institute of Technology. Her main area of interest includes Deep Learning methods that enable computers to interpret unstructured document content and perform real-world tasks with the promise of significantly influencing the way the technological world works.

Barzilay has been an outstanding scholar since childhood. She completed her undergraduate and graduate degree from the Ben-Gurion University of the Negev in 1993 and 1998, respectively. Later on, she obtained a Ph.D. in applied science in 2003 from the University of Columbia. Her thesis, known as Newsblaster, used stories from various news sources to paraphrase elements to build a summary.

In reaching the pinnacles of success, she had to cross various personal barriers. In late 2014, she was diagnosed with carcinoma. Her treatment plans had severe uncertainties, which led her to seek her next innovation. After completing her treatment, she started her long and arduous journey towards this goal. However, to her surprise, the nation's science and cancer foundations weren't ready to invest in her ideas. After her recovery, she was firm to research more in oncology to help other patients going through the same level of suffering.

Barzilay has started applying deep learning to oncology to find effective measures for the treatment of breast cancer. She is currently collaborating with physicians, students, and professors to employ deep learning models that utilize images, text, and structured data to spot trends that affect early diagnosis, treatment, and disease prevention.

Barzilay has made notable contributions to a wide range of problems in linguistics, including both interpretation and generation of human language. She works assiduously in writing new algorithms that help the machine learn annotations from English language and use them to research other texts.

For instance, Barzilay and her students deciphered the traditional Semitic language Ugaritic by mapping cognates and related morphological structures onto the related Hebrew language. Her research mainly focuses on tongue processing (NLP) by extending its potential benefits to a broad range of languages and other people, which also yields insights for theories of language universals. Working together with her students, Barzilay also pioneered the research on reinforcement learning methods for language grounding— mapping language to entities and actions within the world. Through a feedback circuit, the program learns in an unsupervised, coordinated way, allowing it to interact with the environment that supported its understanding, refining its semantic model, and switching the instructions into executable actions. This system has demonstrated a high degree of precision in tasks like configuring computer software user manuals and improving computer performance within the strategy game Civilization.

Barzilay was awarded the MacArthur Fellowship in 2017 due to her “extraordinary originality and dedication in their creative pursuits and a marked capacity for self-direction”. She has also won numerous Best Research paper awards at NAACL and ACL.

Barzilay is a leader for several aspiring women who want to pursue a career in STEM. She is poised to play a crucial role in creating new algorithms that advance the capacity of computers to harness the ability of human language data.

SOURCES:

- https://www.macfound.org/fellows/class-of-2017/regina-barzilay
- https://www.regina.csail.mit.edu/
- https://en.wikipedia.org/wiki/Regina_Barzilay

LEARNING GUIDE

Deep Learning is a subset of Machine Learning. It is concerned with algorithms inspired by the functioning of the human brain and this is referred to as artificial neural networks. Deep learning has various architectures like deep belief networks, deep neural networks, recurrent neural networks and convolutional neural networks. These have been applied to various fields and have produced results comparable to human expert performance. This class of machine learning algorithms uses numerous layers to extract high-level features from raw input. Deep Learning has a hierarchical structure and this allows processing data across a series of layers. Each of these layers integrate subsequent layers of additional information. Choosing the right path to study deep learning can be a challenging task. It is definitely a tough subject to master but with the right guides, learning in-depth and understanding the complex terminologies can become easier. It is extremely important that you start working on projects simultaneously as this will improve your understanding and will ensure that you are thorough with whatever you have learned.

1. **Tutorials:**

- https://www.simplilearn.com/tutorials/deep-learning-tutorial
- https://www.kaggle.com/kanncaa1/deep-learning-tutorial-for-beginners
- https://www.datacamp.com/community/tutorials/deep-learning-python
- https://www.tutorialspoint.com/python_deep_learning/index.htm
- https://www.guru99.com/deep-learning-tutorial.html
- https://machinelearningmastery.com/tutorial-first-neural-network-python-keras/

2. **Playlists:**

- https://www.youtube.com/watch?v=VyWAvY2CF9c
- https://www.youtube.com/watch?v=9jA0KjS7V_c&list=PLZoTAELRMXVPGU70ZGsckrMdr0FteeRUi
- https://www.youtube.com/watch?v=Mubj_fqiAv8&list=PLeo1K3hjS3uu7CxAacxVndI4bE_o3BDtO
- https://www.youtube.com/watch?v=0bMe_vCZo30&list=PLLHTzKZzVU9eaEyErdV26ikyolxOsz6mq

3. **Recommended Books:**

- Deep Learning with Python by *François Chollet*
- Deep Learning for Coders with fastai and PyTorch: AI Applications Without a PhD book by *Jeremy Howard and Sylvain Gugger*
- Neural Networks and Deep Learning by *Michael Nielson* (Online book)

4. **Certification Courses:**

- https://www.coursera.org/learn/intro-to-deep-learning
- https://www.coursera.org/specializations/deep-learning
- https://www.udemy.com/course/complete-guide-to-tensorflow-for-deep-learning-with-python/
- https://www.udemy.com/course/data-science-deep-learning-in-python/
- https://www.udemy.com/course/deeplearning/
- https://www.edx.org/professional-certificate/deep-learning

MYTH BUSTER

1. Artificial Intelligence, Machine Learning, Deep Learning are all the same
-No, these three terms are not synonymous. Machine learning (ML) is a subset of Artificial Intelligence. It entails learning from available data to solve tasks. Deep Learning (DL) is a subset of Machine learning (ML). It uses neural networks to deal with machine learning-related issues.

2. Neural networks (NN) are like the human brain
-Although artificial Neural Networks were indeed inspired by biological Neural Networks, they differ in many ways. These include their speed, the topology of the network, efficiency, size, etc. The biological NN is a very complex network. As our understanding of it is still quite limited, comparing the artificial NN to the biological NN is an overstatement.

3. You need a gigantic amount of data
-There are several pre-trained networks available. Using a network pre-trained on a large dataset to solve a similar problem can reduce the amount of data required at our end. Re-training certain parts of such networks, we can customize them to suit our task.

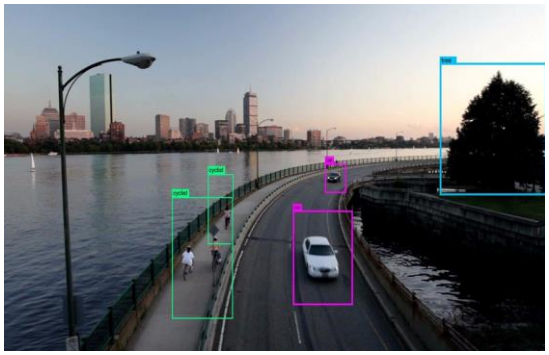
4. Deep learning models can be trained using any kind of data.
-Only certain parts of a large dataset, which correspond to our requirements, are used in training the model. The efficiency of the model highly depends on the accuracy and quality of data available.

5. Deep learning requires a PhD-level understanding of mathematics
-Unless one is interested in researching new algorithms and specialized architectures, deep learning does not require such advanced knowledge of mathematics. Existing deep learning techniques, with or without modifications, can be used to accomplish our tasks, and that only requires proficiency in high school level mathematics.

GIZMO

Can you imagine a world powered by gadgets that work like the human brain essentially being humanized technology? Sounds pretty amazing and like a thing of the future, right? Well, you're in for a surprise because deep learning has proved to be a pivotal key in developing many devices whose inner mechanisms work very similar to human neural processes. The most incredible part is that these gadgets and software are very much real and thriving in the present, so let's take a look at a few of them.

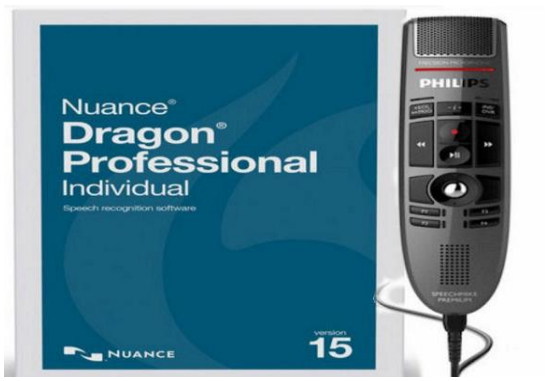
1. **Neurala Brain**
Developed by Neurala, this deep learning incorporated platform allows electronic products to work on procedures akin to basic human neural responses. It works on a principle parallel to the functioning of the human brain and imparts to the devices that it is coupled with, the ability to react and interact with their respective environment, adapt to physical changes, identify preliminary details of external conditions, and improvise in critical situations. You can learn more about this phenomenal deep learning application
here: https://www.neurala.com/home-may



2. **Waymo One**
This is a self-driving car service that uses several autonomous vehicles in a ride-hailing system. Such automobiles are equipped with radars that track the positions and distances of vehicles nearby, softwares that create maps of the surrounding environments, maintain a road map with frequent updates on upcoming traffic and other driving based details and form a blueprint like visualization of the external conditions, and video cameras to detect the presence cars close by and further transmit this information to the previously mentioned accessories. To delve a bit deeper into this ride of the future, visit this website: https://waymo.com/faq/

3**. AlphaZero**
AlphaZero is a program developed by DeepMind aimed to accomplish the mastery of 3 games, namely Shogi, Chess and Go. Working parallel to how a neural network would run, this application was trained in the ways of each game from which it was able to acquire information and subsequently gained practice in the game itself until it was sufficiently equipped to play these games on its own, which it was able to successfully do afterward.
If you'd like to unravel the entire process behind this then check out: https://deepmind.com/blog/article/alphazero-shedding-new-light-grand-games-chess-shogi-and-go

4. **Dragon Professional**
Speech recognition allows computers and other such devices to translate spoken language into virtual text and thereby use the information so obtained to respond to the user with reference to the spoken context. Dragon Professional is a software package that specializes in this field and allows users to transfer verbal transcripts immediately, accurately document the text, and much more.
There's quite a lot of intricacies behind the working of this feature, which you can learn about here: https://www.dummies.com/software/dragon-naturallyspeaking/how-dragon-naturallyspeaking-works/



Here we've seen a few prime examples of deep learning applications, but this is just the tip of the iceberg. There's a lot more to be explored in this mystical sphere under AI and hopefully, in the future, we'll be looking at many more deep learning discoveries that will change the world for the better.

SUMMARY

Demystifying Deep Learning

Machine learning is a subset of Artificial intelligence which works on the principle that machines can learn from data and acquire decision-making skills without human intervention. If we were to dwell on the topic, we'd come across Deep learning. It is a branch that focuses on learning from unstructured and unlabelled data using networks. Another term for the same would be Deep neural networking. Its applications are widespread in the technical domain, and for the sake of this summary, we'll focus on the most common applications.

A phone plays a crucial part in our lives. It's a warehouse of security secrets, and to guard the same, we require biometrics present in modern-day society as a fingerprint scanner or facial recognizer. Analysing one's face is a humanly easy task. However, the same remained a challenge for computers until recently.

Detection is the first step when it comes to recognition. A computer would approach this as an object recognition problem. Here, both the location and extent of the face are localized. Given that this is an initial step, it must be robust. Therefore, the taxonomy of face detection has two categories: Feature-based and image-based detection. Let's try visualizing this. A software captures your face; it doesn't matter if you are alone or in a crowd. This software will then measure a variety of facial features, also referred to as nodal points. These include the distance between the eye, depth of eye socket, nose width, and so on. Each program would use a different nodal point, collecting up to 80 measurements. These measurements help in establishing a mathematical formula which is an individual's unique facial signature. This signature is run through a database in a matter of seconds. Thus, extending its use beyond unlocking your phone. The global market for facial recognition is expected to reach 12.92 billion dollars by 2027. Even today, it is extensively used in other fields like retail, transportation, banking, and even the hospitality industry.

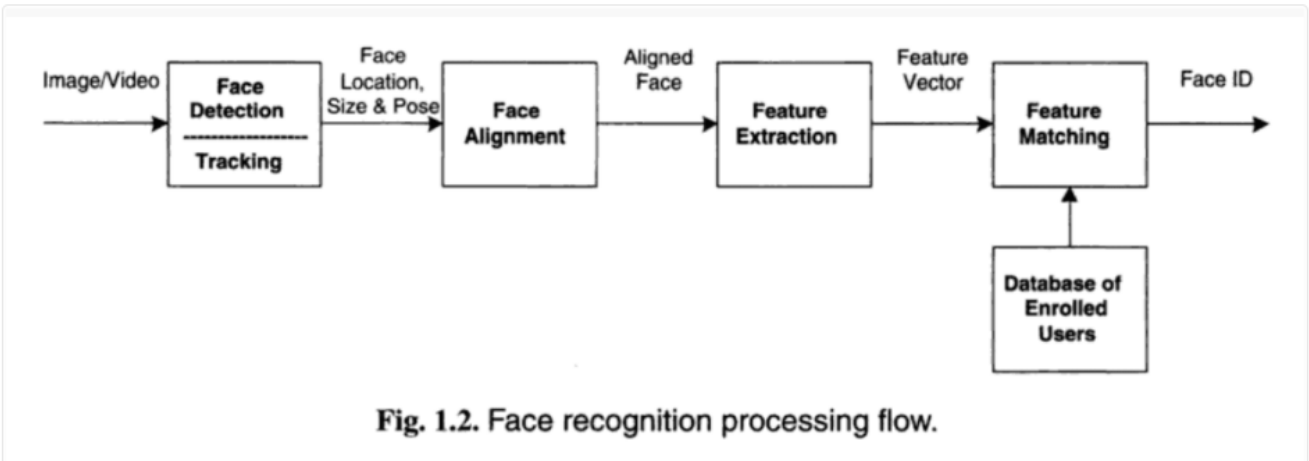


Fig. 1.2. Face recognition processing flow.

Overview of the Steps in a Face Recognition Process. Taken from “Handbook of Face Recognition,” 2011.

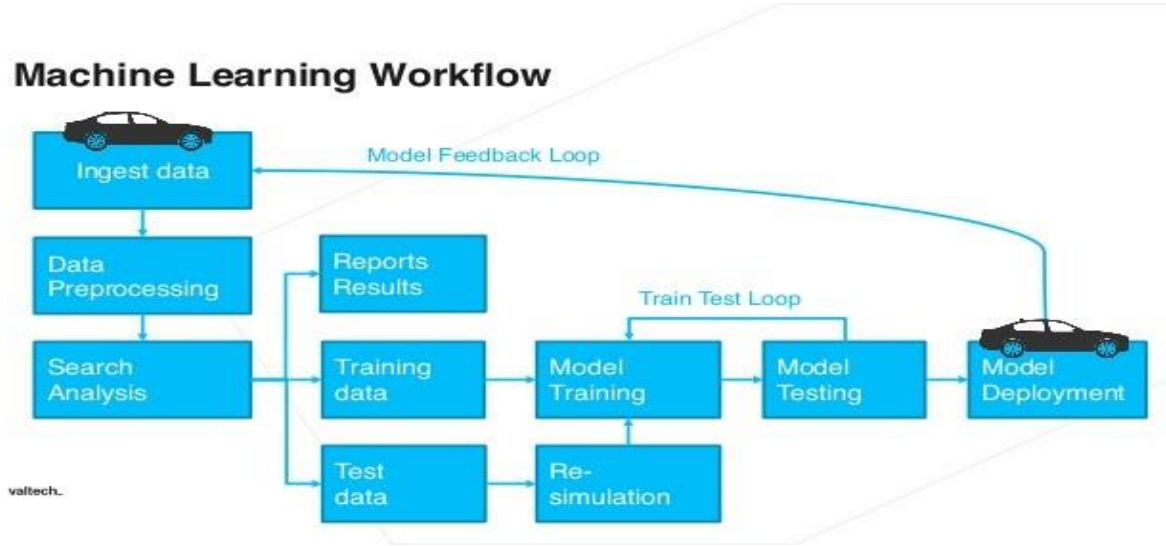
Now that we have managed to understand how facial recognition works, let's dive into the immediate next topic. Have you ever opened google and felt extensively lazy to type in the search bar? At such times, we end up using google speech, but how does the software recognize or even understand our voice? Well, we've got deep learning to thank for that as well.

Technically, it works the same way text or image classification works, but given it comes in different formats and sometimes has 1-2 waves, how exactly can we classify it? We use a function from a pre-processing library to convert any given wave file into a sonic spectrogram. The x-axis of this spectrogram is time, and the y-axis is usually the frequency of sound. Darkness is the amount of energy at the frequency. When we transform speech, we use MMCC (coagulation of time and frequency). This audio data is reshaped by adding a channel element. By using a convolution network, we can retrieve the data to understand each word. Now, keep in mind that we are visualizing ourselves as the software in this scenario.

SUMMARY

A lot of times, we tend to interchange 'speech' and 'voice' recognition. Both these words remain different from each other. A speech recognition identifies an individual's speech, while a voice recognition would differentiate among various interpreted voices. The working of these applications is very similar to facial recognition. In short, this software would break a speech into digitally formatted bits and then proceed to interpret and analyse the same. This can be equated to the 80 measurements composed into a mathematical formula for a unique signature.

Image recognition, speech recognition, and even voice recognition led us to something much more massively commendable. How many of you remember when tesla announced commercially available autonomous cars? One of the first self-driving cars used neural networking to detect lane lines and drive. The method was called ALVINN (1989). Today, Autonomous driving considers four key points that are perception, localization, planning, and control.



Now, perception takes three sensors into account: Camera, light, and radio detection and ranging; This is closely similar to image recognition and requires a lot of deep learning for recognition. To extract lane lines, we end up using algorithms like LaneNet that are popular. To understand more about how this works, here's a link: https://arxiv.org/pdf/1807.01726.pdf
Algorithms like YOLO or SSD are significant in the field of perception. Finally, stereo information helps us build a Pseudo LIDAR, thereby doing a 3D perception with 2D sensors. Now, the first thing which you must think of when localization is brought into play is GPS. Localization is possible in two ways: knowing the map and initial position and not knowing the latter. They both rely on landmark detection. To detect these, we use extended particle filters. Moving on to planning, it is the brain of the entire vehicle. Its core necessity is to make decisions. Now, this is broken down into three steps: High-level, behavioural, and path planning.

Behavioural planning furthermore includes two steps: prediction and decision making. Don't let the plethora of terms confuse you. The application remains the same. Now that we've covered the most digitally common applications, I hope you understand the application of deep learning.

But We have to ask ourselves, what does Deep Learning plan on imitating? Sure, it refers to a layer of nodes that learn from unstructured data to make decisions, but what exactly is it planning to replace? The nodes are very similar to neurons that make up the human brain. In an artificial neural network, the signal is transmitted between these nodes. This furthermore results in the analysis of data and provides us with the skills required for decision-making. In a way, it imitates human behaviour but is also beyond what an individual is capable of achieving.

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https://medium.com/the-research-nest/a-brief-literature-review-on-the-application-of-deep-learning-in-building-self-driving-cars-5cc8746a0d82
https://en.wikipedia.org/wiki/Speech_recognition
https://www.youtube.com/watch?v=Qf4YJcHXtcY

FAQs

1. **What is the difference between Deep Learning and Machine Learning?**
   Machine learning has a subfield called deep learning. Although all come under the umbrella of artificial intelligence, deep learning is the engine that drives the most human-like AI. Machine learning is a technique for parsing data, learning from it, and making educated decisions based on what it has learned. Deep learning creates an "artificial neural network" that can learn and make intelligent decisions on its own by layering algorithms.

2. **What are neural networks?**
   A neural network is a structure that is modelled after the human brain, and it consists of an input layer, several hidden layers, and an output layer. Data is fed into the neurons as input. Using acceptable weights and preferences, the information is passed to the next layer. The final value expected by the artificial neuron is the output.

3. **When and where do you use neural networks?**
   Neural networks are well-suited to assisting individuals in real-world environments with complicated problems. They can learn and model nonlinear and dynamic interactions between inputs and outputs, make generalisations and inferences, uncover hidden relationships, patterns, and forecasts, and model extremely unpredictable data and variances to forecast unusual events (such as fraud detection).

4. **What is more important- model performance or model accuracy?**
   Although both performance and accuracy are significant and dependent on the application in question, accuracy is typically more important. If the deep learning algorithm generates inaccurate information, it doesn't matter how fast it does it.

5. **What is Tensorflow?**
   TensorFlow is one of the most commonly used Deep Learning libraries in companies today, among the many Deep Learning frameworks available. It enables you to work with large amounts of data and build neural network models to solve market problems.

6. **What is the Boltzmann Machine?**
   Boltzmann Machines are a type of unsupervised deep learning model in which each node is connected to every other node. It's a stochastic or generative DL model, not a deterministic one. It's almost a reflection of a device. Boltzmann devices show humans how systems function under natural situations, which helps us understand anomalies.

7. **What does Deep Learning have in store for the future?**
   DL will be democratised in the next 5 to 10 years across all app development platforms. Developers' toolkits will have DL tools as standard. To speed up learning, reusable DL modules will be integrated into standard DL libraries and will bear the teaching characteristics of previous versions.

8. **What are the prerequisites for starting with Deep Learning?**
   Some basic requirements for starting with Deep Learning are Machine Learning, Mathematics and a programming language like Python or R.

SPOTLIGHT

Domain: Design

For efficient working of any club or chapter, Seamless Flow of Work is necessary. Organizing that flow is equivalent to completing each task to achieve strategic plans. IEEE-WIE is a technical chapter that is divided into 4 major departments namely technical, design, management, and editorial department. The design department acts as the glue that holds all the pieces of the chapter together in pursuit of one ultimate goal – success. I've had the golden opportunity to talk to a very ambitious, sweet, and confident woman, **the head of the design department of IEEE-WIE, Dharani Chavva**. She has shared her thoughts on some of the salient features of the department.

Q1) Could you briefly explain the functionality of the design department?

Dharani: Every event whether it is formal or informal, small or huge, requires publicity to grab more people's attention and to convey the exact aim of the event leading to its successful conduct. One of the ways by which we as designers promote the event is through artistic and informative posters. The design Head oversees numerous creative design projects for our club, which includes designing different posters to increase the reach of our club, inspiring others by making greeting cards and congratulation posters for all the amazing accomplishments and extraordinary work done by our brilliantly talented core members.

Q2) What is a typical day like being the design head? What are your responsibilities for the efficient functioning of the department?

Dharani: Well, I would say that It is pretty amazing being the design head as I get to manage all our outstanding members with different fantastic ideas to ensure that all efforts lead to creative outcomes. The prime task I am responsible for is casting a creative vision in all our projects and making sure that the department functions properly and efficiently.

Q3) How does this department encourage personal as well as professional growth?

Dharani: We organize explanatory sessions that enlighten all team members and help them improve their personal design skills. Also, we work together as a team for all the tasks which involves coordination, appreciating each other's innovativeness, learning from each other, and gaining professional skills.

Q4) As the design head, what is your strategy to drive results? What type of growth do you want to see in this domain in the future?

Dharani: My strategy to fetch ultimate results is to keep in constant touch with my team members. I try to motivate and guide my team and keep them involved in the decision-making. People need to understand the importance that design holds. More often it is how you present the design rather than what you are actually presenting. The active participation of more people in the design domain is something I would like to see and would really appreciate.

Q5) What are the challenges that you have encountered while working in this domain?

Dharani: The definition of a good design is subjective for everyone. So, the major challenge in the design domain would definitely be the difference of opinion and integrating all opinions to reach a satisfactory result.

Q6) What do you like the most about working in this department?

Dharani: I get the opportunity to see lots of creativity from designers. There is a sense of freedom and power we feel while making something along with the creativity we get to express. The best thing about the design world is that it's constantly evolving and redefining itself. Due to this, we need not confine ourselves around a single idea. This constant reinvention and willingness to try new ideas adds up to the excitement of working in the design domain

Q7) How is WIE's design team different from that of other clubs and chapters?

Dharani: As a result of the regular explanatory sessions, the skills we develop & the experience we gain not only brings value to our domain but in turn, also helps us to acquire experience & sharpen our skills amidst our domain's professional work culture. WIE's Design Domain is a place wherein the learning curve is great & hard work is appreciated. With this right atmosphere, one can achieve much more than just completing tasks.

STAR PERFORMERS

1. **Design:**
   Gowri Priyanka has amazed everyone with her work ethic and consistency. As a valued member of the design team, she has been working tirelessly to design the amazing posters and feed posts that go up on our social media handles. She has been awarded the member of the month for her creative insights and sheer hard work. Many congratulations to Gowri Priyanka!

2. **Editorial:**
   Harika Naishadham has been honoured with the member of the month for the editorial domain for her valuable contributions to the department. She is always eager to volunteer for any task assigned and has a creative approach to it. She is an amazing writer and keeps herself updated with all the latest technology trends. She has written some fabulous pieces for our blog which has garnered the attention of a lot of readers. Huge shout out to Harika for delivering her best!

3. **Management:**
   Akanksha Dhar from Computer Science and Engineering has proved to be a valuable asset in the management domain. She is consistent with her work and responsibilities and she makes sure that all the events are carried out smoothly. She volunteered for several tasks and also managed to bring in speakers for several events. She is very well-deserving of the Member of the Month honor and IEEE WIE is proud of her accomplishments

4. **Technical:**
   Alpana Singh is nominated for the member of the month from the technical domain for her diligence and dedication. She has been motivated to complete all her assigned projects on time and has shown active participation in all the events and night sessions that have been conducted by the technical domain. She does not shy away from providing valuable input during club meetings and is always eager to learn new things. Kudos to you, Alpana!

EDITORS

Vrushali Deshmukh- Editor-in-Chief

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Suhasini Srivastava

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