

# Research Paper on Conceptual Study of Machines Learning for Agriculture Development.

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## **ABSTRACT :-**

The Business organizations are improving their performance by using advance technology in performing the business functions . A advanced technology like machine learning can be used in Agriculture sector for the benefit of the farmers . smart machine is a device embedded with machine to assist humans in various task operations. Agriculture has various activities and functionalities which can be done through these machines . They can be called as smart machines , Since much of technology is applied science, these tools and techniques are having applications in all the sectors once they are coded and its program are made ready. From those resources, technology can be used to improve the yield of the crops and this would be great help to agriculture sector.

**KEYWORDS- Machine , Technology , Business , Agriculture , Applications. Artificial Intelligence.**

## **INTRODUCTION**

The paper is highlighting on the use of machine learning tools and techniques to increase the yield of the farm. New knowledge has enabled people to create new things, and conversely, many scientific endeavors are made possible by technologies which

This Paper is a decent contribution in creating awareness for using the machine learning tools and

techniques in Agriculture area. Other resources, including *technological artifacts* used in everyday life. The Agriculture sector is one of the most important sector for any country use of this advance technology will increase the yield of the crops and also it make the farmers more effective in performing farming activities using machine learning tools and techniques .

**Machine** intelligence is what's created when **machines** are programmed with some (but not all) aspects of human intelligence, including learning, problem solving and prioritization. With these (limited) abilities, a **machine** can tackle a complex set of problems.

### What is Machine Learning?

Why do we need to care about machine learning?

*A breakthrough in machine learning would be worth ten Microsoft's.* **Bill Gates**, Former Chairman, Microsoft

Machine Learning is getting computers to program themselves. If programming is automation, then machine learning is automating the process of automation. Writing software is the bottleneck, we don't have enough good developers. Let the data do the work instead of people. Machine learning is the way to make programming scalable.

**Traditional Programming:** Data and program is run on the computer to produce the output.

**Machine Learning:** Data and output is run on the computer to create a program. This program can be used in traditional programming. Machine learning is like farming or gardening. Seeds is the algorithms, nutrients is the data, the Gardner is you and plants is the programs.

Machine learning approaches are traditionally divided into three broad categories, depending on the nature of the "signal" or "feedback" available to the learning system:

**Supervised learning:** The computer is presented with example inputs and their desired outputs, given by a

"teacher", and the goal is to learn a general rule that maps inputs to outputs.

**Unsupervised learning:** No labels are given to the learning algorithm, leaving it on its own to find structure in its input. Unsupervised learning can be a goal in itself (discovering hidden patterns in data) or a means towards an end (feature learning).

**Reinforcement learning:** A computer program interacts with a dynamic environment in which it must perform a certain goal (such as driving a vehicle or playing a game against an opponent). As it navigates its problem space, the program is provided feedback that's analogous to rewards, which it tries to maximize.



*Source :-*

<https://www.google.com/search?q=machine+>

### Applications of Machine Learning

Following are the some of the a applications of machine learning:

**Web search:** ranking page based on what you are most likely to click on.

**Computational biology:** rational design drugs in the computer based on past experiments.

**Finance:** decide who to send what credit card offers to. Evaluation of risk on credit offers. How to decide where to invest money.

**E-commerce:** Predicting customer churn. Whether or not a transaction is fraudulent.

**Space exploration:** space probes and radio astronomy.

**Robotics:** how to handle uncertainty in new environments. Autonomous. Self-driving car.



<https://www.google.com/search?q=mac>

**Information extraction:** Ask questions over databases across the web.

**Social networks:** Data on relationships and preferences. Machine learning to extract value from data.

**Debugging:** Use in computer science problems like debugging. Labor intensive process. The process of debugging can be done using machine learning and it will benefit the programmers in reducing the software development life cycle.

### Key Elements of Machine Learning

There are tens of thousands of machine learning algorithms and hundreds of new algorithms are developed every year. Every machine learning algorithm has three components:

**Representation:** how to represent knowledge. Examples include decision trees, sets of rules, instances, graphical models, neural networks, support vector machines, model ensembles and others.

**Evaluation:** the way to evaluate candidate programs (hypotheses). Examples include accuracy, prediction and recall, squared error, likelihood, posterior

probability, cost, margin, entropy k-L divergence and others.

**Optimization:** the way candidate programs are generated known as the search process. For example combinatorial optimization, convex optimization, constrained optimization.

All machine learning algorithms are combinations of these three components. A framework for understanding all algorithms.



Source :-

<https://www.beechamresearch.com/files/BRL%>



Source :-<https://www.google.com/search?q=smart>

## APPLICATIONS OF MACHINE LEARNING TO AGRICULTURE SECTOR

### Smart Farming

Effective harvesting comes down to detecting the most potent acres and crops on a particular day. Today's yield prediction technologies don't base

decisions solely on historical data but also utilize computer vision software coupled with smart weather analysis to meet the ever-growing agricultural demand. ML has a tremendous impact on the effectiveness of crop classification and quality, agrochemical production, disease detection and prevention.

### ***Species Identification***

Even experienced farmers have a hard time differentiating two very similar plants as in many cases it's only slightest variations in color or shape that set them apart. Image analysis significantly raises the accuracy and speed of species identification, which also saves farmers' time and resources. ML algorithms can precisely detect a particular plant type by assessing the leaf vein map containing the decisive information.

### ***Selective Breeding***

Breeding for the desired features in crops is a very resource-intensive and time-consuming process, which however drives much value in commercial agriculture. Currently, the world's brightest minds in prescriptive plant breeding and AI consultants are exploring various ML applications to make their decisions more informed.

A study in the 2019 volume of *Plant Phonemics* describes how researchers used drones and on-field sensors to gather lavish amounts of data related to soybean cultivation nuances. The gathered data sets include basic information about environmental conditions such as humidity and temperature and in-depth information about row spacing and seeding density. The drones are used now to perform various observations on farm.

By feeding cleaned data sets to ML algorithms along with yield results, researchers were able to create a predictive model that can successfully identify which plant types would be the most prolific under specific conditions. Although the research is based solely on soybean cultivation, these findings unveil extremely promising business opportunities for the agricultural sector as a whole. Despite that agricultural professionals' instincts, knowledge and experience are undeniably useful, this ML-driven approach is superior to conventional techniques of selective breeding. It allows farmers to identify what exact plant traits would result in the most fruitful yield under specific growing conditions.

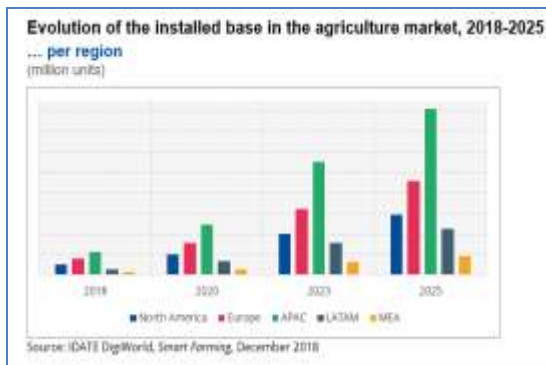


**Source :-**

**<https://www.google.com/search?q=machine+lea>**



**Source :- [google.com/search?q=machine+learning](https://www.google.com/search?q=machine+learning)**



Source :-<https://en.idate.org/smart-farming-news->

**FUTURE SCOPE IN AGRICULTURE WITH ADVANCED TECHNOLOGY**



Source :-<https://en.idate.org/smart-farmingtech>

The machine learning is going to make positive change in agriculture sector since many advanced techniques can be used to improve the agriculture activities in future the scope is wide since hardware , networking and other facilities will be created by the government and private sector to get good new speed use of fast speed servers and its technology will be updated as per the use of software in agriculture area. new technique with best way to perform various agriculture The above graph sows the opportunities in future for AI related software’s and application in agriculture market which is a positive sign for this sector

**CONCLUSION :-**

The machine learning is new technique with best way to perform various agriculture activities and make the efforts of farmer useful and fruitful. Smart machines will be widely used in business firms in coming years and experts will have to provide such machines which will perform various business functions in minimum time and in less cost Agriculture is important sector which will increase the crop yield. The new technologies will need to prove themselves over time in an industrial environment, and inhibitors such as security concerns will need to be overcome. Machine builders that want to maintain or improve their market position will make use of control systems that capitalize on the potential of using distributed intelligence in machines. Leveraging new technologies to improve performance and efficiency. This paper is a decent contribution in creating awareness on this important topic to the readers on agriculture development.

**ACKNOWLEDGEMENT :-**

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