

Machine Learning Demystified: Concepts, Algorithms, and Use Cases

Divya Sai Jaladi^{1*}, Sandeep Vutla²

¹Senior Lead Application Developer, SCDMV, 10311 Wilson Boulevard, Blythewood, SC 29016, UNITED STATES

²Assistant Vice President, Senior-Data Engineer, Chubb, 202 Halls Mill Rd, Whitehouse Station, NJ 08889, UNITED STATES

*Corresponding Author: divyasaij26@gmail.com

Abstract

In recent years, Machine Learning (ML) has advanced from the undertaking of not many PC fans abusing the chance of PCs figuring out how to mess around. A piece of Mathematics (Statistics) that only here and there thought about computational methodologies, to an autonomous examination discipline that has not just given the strong base for measurable computational standards of learning systems. This document centers around clarifying the idea and advancement of Machine Learning, a portion of the mainstream Machine Learning calculations, and attempt to think about the three most mainstream estimates dependent on some fundamental concepts. Sentiment 140 datasets were utilized, and execution of every analysis as far as preparing time, expectation time, and exactness of forecast have been archived and analyzed.

Keywords: Machine Learning, Algorithm, Data, Training, Accuracy

Introduction

AI is a worldview that may allude to gaining from experience (which for this situation is past information) to improve future execution. The only focal point of this field is programmed learning strategies. Learning alludes to change or improvement of calculation dependent on past "encounters" consequently with no outside help from the human. While planning a machine, the developer has a particular reason as a primary concern. For example, J. K. Rowling's Harry Potter Series and Robert Galbraith's Cormoran Strike Series. To affirm the case that it was to be sure Rowling, who had written those books under the name Galbraith, both specialists were connected with by The London Sunday Times and utilizing Forensic Machine Learning they had the option to demonstrate that the case was valid. They build up an AI calculation and "prepared" it with Rowling's just as different journalists composing guides to look for and gain proficiency with the basic examples and afterward "test" the books by Galbraith. The calculation closed that Rowling's and Galbraith's composing coordinated with the most in a few perspectives [1]. So as opposed to planning a calculation to address the issue straightforwardly, utilizing Machine Learning, an analyst look for an approach through which the machine, i.e., the analysis, will concoct its answer depends on the model or preparing informational index gave to it at first [2].

Machine Learning: Interaction of Statistics and Computer Science

AI was the extraordinary outcome when Computer Science and Statistics united. The principle approach that Statistics on a fundamental level utilizes is information derivation, demonstrating theorizes and estimating dependability of the ends.

The characterizing idea of Machine Learning is somewhat unique however incompletely reliant on both regardless. Though Software engineering focuses on physically programming PCs, ML addresses the issue of getting PCs to re-program themselves at whatever point presented to new information dependent on some underlying learning methodologies gave. Statistics centers around information derivation and likelihood; Machine Learning incorporates extra worries about the practicality and viability of designs and calculations to deal with that information, intensifying a few learning assignments into a reduced one and execution measures [2-9].

Machine Learning and Human Learning

A third exploration zone firmly identified with Machine Learning is investigating human and creature minds in Neuroscience, Brain Research, and related fields. The analysts suggested that how a machine could gain is most likely not fundamentally unique about how a creature or a human psyche learn with time and experience. In any case, the exploration focused on tackling AI issues utilizing learning techniques for the human cerebrum did not yield a lot of promising outcomes so far as the investigates worried about factual - computational methodology. Human or creature brain research is not entirely justifiable to date. Despite these troubles, coordinated effort between human learning and AI is expanding for AI to clarify a few learning procedures finding in humans or creatures. For instance, an AI strategy for transient contrast was proposed to explain neural signs in creature learning. It is genuinely anticipated that this coordinated effort is to fill significantly in the coming years.

Data Mining, Artificial Intelligence, and Machine Learning

By and by, these three controls are so entwined and covering that it's nearly to draw a limit or progression among the three. These three fields are cooperatively related, and a mix of these approaches may be utilized as a strategy to deliver more productive and sensitive outputs.

Generally, Data mining is fundamentally about deciphering any sort of information, yet it establishes the framework for fake knowledge and AI. Practically speaking, it tests data from different sources and its investigations and perceives examples and connections in those data that would have been hard to decipher physically. Henceforth, information mining is not a simple strategy to demonstrate speculation yet a technique for drawing essential hypotheses. That mined information and the comparing examples and assumptions might be used as the reason for both AI and counterfeit insight.

Computerized reasoning might be extensively characterized as machines able to tackle a given issue independently with no human mediation. The arrangements are not programmed straightforwardly into the framework; however, the essential information, what's more, the AI deciphering that information produce an answer without help from anyone else. The understanding that goes under is only an information mining calculation.

AI adopts the strategy to a high level by giving the information crucial for a machine to prepare and change when presented with new information. It centers on extracting data from extensively large sets of data and afterward recognizes and distinguishes basic examples utilizing different

measurable measures to improve its capacity to decipher new knowledge and produce more successful outcomes. A few boundaries ought to be "tuned" at the beginning level for better profitability.

AI is the foothold of artificial reasoning. It is impossible to plan any machine having abilities associated with insight, similar to language or vision, to arrive without a moment's delay. That assignment would have been nearly challenging to address. Also, a framework can not be considered astute because it came up short on the capacity to learn and improve from its past openings.

Present Research Questions & Related Work

The Several applications referenced before recommends significant advancement so far in ML calculations and their primary hypothesis. The order is disclosing a few ways, testing the scope of learning issues. ML is a vast discipline, and over recent years, various specialists have added their works in this field. The count of these works is countably boundless, and referencing each work is out of this paper's extent. However, this essay portrays the fundamental exploration and references some of the new eminent deals with that task.

Using Unlabelled Data in Supervised Learning

Regulated learning calculations estimated the connection among highlights and names by characterizing an estimator $f: X \rightarrow Y$ for a particular group of pre-named preparing information $\{x_i, y_i\}$. The real test in this methodology is pre-named information isn't in every case promptly accessible. So before applying Supervised Classification, data should be preprocessed, sifted furthermore, marked utilizing solo learning, highlight extraction, dimensionality decrease, and so forth, thereby adding to the aggregate cost. This climb in price can be diminished successfully if the Supervised calculation can utilize unlabelled information (e.g., pictures). Curiously, in numerous extraordinary examples of learning issues with extra suspicions, unlabelled news can be justified to improve regulated learning's normal exactness. Like, consider ordering web pages or distinguishing spam messages.

A. Transferring the Learning Experience

In numerous genuine issues, the administered calculation may include learning a group of related capacities (e.g., finding functions for emergency clinics worldwide) instead of a solitary total. Whether the analysis functions for various urban areas (e.g., Kolkata and London) are attempted to be moderately unique, a few shared characteristics are expected. ML algorithms like advanced Bayesian methods give one methodology that expects the learning boundaries of both the capacities, has some regular earlier probabilities and permits the information from various city medical clinics to overrule relevant priors as fitting. The nuance further increments when the exchange among the capacities is compounded.

B. Linking Different ML Algorithms

Various ML calculations have been presented and probed in multiple spaces. Consider theories two regulated order calculations, Naive Bayes and Logistic Regression. The two of them approach numerous informational indexes unmistakably. Yet, their comparability can be shown when executed to explicit sorts of preparing information. When all is said in done, the conceptual

understanding of ML calculations, their convergence highlights, what's more, their respective effectiveness and restrictions to date stay an extreme examination concern.

C. Best Strategic Approach for Learners Which Collects Their Data

A line research discipline centers around learning frameworks that effectively collect data for its preparation and learning rather than precisely utilizing information gathered by a few different methods. The examination is dedicated to tracking down the most successful methodology to surrender the learning calculation control. For instance, consider a medication testing system that attempts to get familiar with the medication's achievement while observing the uncovered patients for possible obscure side impacts and try to limit them thus.

D. Privacy Preserving Data Mining

This methodology involves successfully applying information mining and getting results without abusing the confidential information is drawing in an assortment of examination networks and past. Consider a clinical conclusion routine trained with information from emergency clinics everywhere in the world. In any case, because of protection concerns, this sort of use isn't generally pursued. Even if this presents ago across the street between information mining and information protection, continuous examination says a framework can have both. One proposed arrangement of the above issue is to build up a standard learning calculation rather than a focal information base. Every one of the emergency clinics may be permitted to utilize the measure under pre-characterized limitations to ensure the patients' security and afterward hand it over to the following. This is a blasting research area, joining measurable abuse of information and late cryptographic procedures to guarantee information protection.

E. Never-Endless Learners

The vast majority of the AI errands involve preparing the learner using certain informational indexes, at that point put to the side the student, what's more, use the yield. While learning in people and different creatures, adapt persistently, adjusting various abilities in progression with experience, and utilize these learnings and capacities in a completely synergistic way. Despite sizeable business utilization of ML calculations, they are learning in machines(computers)to date has remained strikingly lacking in human or creature learning. An elective methodology that more diligently captures the variety, skill, and accumulating character of learning in humans, is named continuous learning. For example, the Never Ended Language Learner (NELL) [8] is a student whose capacity is figuring out how to understand website pages and has been accounted for to peruse the internet consistently since January 2010. NELL has obtained almost 80 million certainty weighted feelings (Example, served with (tea, bread rolls)) and has had the option to learn a million sets of highlights and boundaries that capacitate it to gain these convictions. Moreover, it has gotten skillful in perusing (extricating) more convictions and topple old inaccurate ones, adding to an assortment of certainty and provenance for every sentence and thereby improving each day than the last.

Categorization of ML Algorithms

A mind-boggling number of ML calculations have been planned and presented over past years. Not every person of them is generally known. Some of them didn't fulfill or tackle the issue, so another

was given in its place. Here the calculations are comprehensively gathered into two classifications, and those two gatherings are further sub-isolated. This part attempt to name the most mainstream ML calculations and the following area thinks about the three most generally utilized ML calculations.

A. Group by Learning Style

1. **Administered learning** — Input information or preparing information has a pre-decided mark, for example, Valid/False, Positive/Negative, Spam/Not Spam, and so forth. A capacity or a classifier is assembled and prepared to foresee the name of test information. The classifier is appropriately tuned (boundary esteems are adjusted) to accomplish a reasonable degree of precision.
2. **Unsupervised learning** - Input information or preparing information isn't marked. A classifier is planned by reasoning existing examples or bunch in the preparation datasets.
3. **Semi-supervised learning** - Training dataset contains both marked and unlabelled information. The classifier is trained to gain proficiency to characterize and mark the news just as to foresee.
4. **Reinforcement learning** - The calculation is prepared to plan an activity to circumstance with the goal that the prize or criticism signal is expanded. The classifier isn't modified directly to pick the move; however, instead of prepared to find the most remunerating activities by experimentation.
5. **Transduction** - Though it has comparable characteristics with administering learning, it doesn't build up an unequivocal classifier. It attempts to foresee the yield dependent on preparing information, preparing marks, and test data.
6. **Figuring out how to learn** - The classifier is trained to understand the incited inclination during past stages.
7. It is vital and proficient to coordinate the ML calculations regarding learning strategies when one needs to think about the meaning of the preparation information and pick the grouping to decide the more prominent degree of exactness.

B. Algorithms Grouped BY Similarity

1. Regression Algorithms

Relapse investigation is essential for prescient examination and adventure co-connection between subordinate (target) and free factors. The prominent relapse models are: Linear Regression, Logistic Regression, Stepwise Relapse, Ordinary Least Squares Regression (OLSR), Multivariate Adaptive Regression Splines (MARS), Locally Assessed Scatterplot Smoothing (LOESS), and so forth [10].

2. Instance-based Algorithms

When another issue or model is experienced, it is analyzed as per the put-away examples to decide or anticipate the objective capacity value. It can just supplant a put-out case by another if that is a preferable fit over the previous. Because of this, they are otherwise called champs, bring home all the glory technique. Models: K-Nearest Neighbor (KNN), Learning Vector Quantisation (LVQ), Self-Organizing Map (SOM), Locally Weighted Learning (LWL), and so on

3. Regularization Algorithm

Regularization is essentially the way toward neutralizing overfitting or lessen the exceptions. Regularization is only a straightforward but fantastic change with other existing ML models, normally Regressive Models. It smoothes up the relapse line by castigating any bend bowed that attempts to coordinate with the anomalies. Examples: Ridge Regression, Least Absolute Shrinkage and Selection Operator (LASSO), Elastic Net, Least-Angle Regression (LARS), and so forth

4. Decision Tree Algorithms

A choice tree develops a tree-like design including potential answers for an issue dependent on specific requirements. It is so named for it starts with a solitary straightforward choice or root, which at that point forks off into various branches until an intention or expectation is made, shaping a tree. They are supported for their capacity to formalize the issue close by measure, recognizing potential arrangements quicker and more precisely than others. Models: Classification and Regression Tree (CART), Iterative Dichotomiser 3 (ID3), C4.5 and C5.0, Chi-squared Automatic Interaction Detection (CHAID), Decision Stump, M5, Restrictive Decision Trees, and so forth

5. Bayesian Algorithms

A gathering of ML calculations utilizes Bayes' Theorem to tackle grouping and relapse issues. Examples: Naive Bayes, Gaussian Naive Bayes, Multinomial Naive Bayes, Averaged One-Dependence Estimators (AODE), Bayesian Belief Network (BBN), Bayesian Network (BN), and so forth.

6. Support Vector Machine (SVM)

SVM is so mainstream an ML strategy that it very well maybe it's very own gathering. It uses an isolating hyperplane or a choice plane to demarcate choice limits among various information points classified with multiple names. It is a carefully administered order calculation. All in all, the analysis builds up an ideal hyperplane using input information or preparing information, and this choice plane in turns categories new models. In light of the bit being used, SVM can perform both straight and nonlinear grouping.

7. Clustering Algorithms

Grouping is worried about utilizing instilled design in datasets to arrange and mark the information accordingly. Examples: K-Means, K-Medians, Affinity Propagation, Spectral Clustering, Ward progressive grouping, Agglomerative bunching. DBSCAN, Gaussian Mixtures, Birch, Mean Shift, Expectation-Maximization (EM), and so on

8. Association Rule Learning Algorithms

Affiliation rules help discover a correlation between apparently unassociated information. Internet business sites broadly utilize them to foresee client practices and future requirements to elevate certain engaging items to him. Models: Apriori calculation, Eclat calculation, and so forth

9. Artificial Neural Network (ANN) Algorithms

A model is dependent on the assembled and activities of real neural organizations of people or animals. ANNs are viewed as non-direct models as it attempts to find the complex relationship among information and yield information. However, it draws tests from details instead of considering the whole set and accordingly decreasing expense and time. Models: Perceptron, Back-Spread, Hop-field Network, Radial Basis Function Network (RBFN), and so forth

10. Deep Learning Algorithms

These are more modernized adaptations of ANNs that gain by the abundant inventory of information today. They are utilized larger neural organizations to take care of semi-directed issues where a significant bit of proliferate information is unlabelled or not grouped. Models: Deep Boltzmann Machine (DBM), Deep Belief Networks (DBN), Convolutional Neural Network (CNN), Stacked Auto-Encoders, and so forth

11. Dimensionality Reduction Algorithms

Dimensionality decrease is ordinarily utilized to diminish a more extensive informational index to its most discriminative segments. This gives an appropriate perception for information with various highlights or high dimensionality and helps carry out directed grouping more efficiently. Examples: Principal Component Analysis (PCA), Principal Component Regression (PCR), Partial Least Squares Regression (PLSR), Sammon Mapping, Multidimensional Scaling (MDS), Projection Pursuit, Linear Discriminant Analysis (LDA), Mixture Discriminant Analysis (MDA), Quadratic Discriminant Analysis (QDA), Adaptable Discriminant Analysis (FDA) and so forth

12. Ensemble Algorithms

A group technique's fundamental motivation is to incorporate the projections of a few more vulnerable assessors that are separately prepared to support up or improve generalisability or power over a solitary assessor. The kinds of students and the way to consolidate them are pains takingly picked to augment the exactness. Models: Boosting, Bootstrapped Total (Bagging), AdaBoost, Stacked Generalization (mixing), Gradient Boosting Machines (GBM), Gradient Supported Regression Trees (GBRT), Random Forest, Extremely Randomized Trees, etc.

Measuring & Comparing Performances of popular ML Algorithms

Different specialists have added to ML. Various calculations and strategies have been presented as referenced before; if it is firmly concentrated a large portion of the functional ML approach incorporates three principle regulated measures or their variation. These three are, to be specific, Naive Bayes, Support Vector Machine, and Decision Tree. A more significant part of analysts have used the idea of these three, be it straightforwardly or with a boosting calculation, to improve the

productivity further. These three calculations are talked about momentarily in the accompanying segment.

A. Naive Bayes Classifier

It is a directed arrangement method developed utilizing Bayes' Theorem of restrictive likelihood with a 'Credulous' presumption that each pair of highlights is commonly autonomous. In less complex words, the presence of an element isn't affected by another using any means. Independent of this misrepresented supposition, NB classifiers performed very well in numerous pragmatic circumstances, as text arrangement and spam identification. Just a limited quantity of preparing information is needed to gauge certain boundaries. Alongside, NB classifiers have impressively beaten even exceptionally progressed order methods [11-15].

B. Support Vector Machine

SVM, another regulated order calculation proposed by Vapnik in the 1960s, has been pulled in a significant consideration of researchers. This methodology's basic mathematical explanation includes determining an ideal isolating plane or hyperplane that isolates the two classes or bunches of information that focuses somewhat and is equidistant from the two of them. SVM was defined at first for the direct appropriation of information focuses. Afterward, the piece work was acquainted with tackling nonlinear pieces of information too.

C. Decision Tree

A characterization tree, prominently known as a choice tree, is perhaps the best-managed learning calculation. It builds a chart or tree that utilizes expanding strategy to show each probable result of choice. In a choice tree portrayal, each inside hub tests a component, each branch relates to the development of the parent hub. Furthermore, every leaf at long last allocates the class mark. A big picture perspective is applied beginning at the root of the tree.

Presently, these three exhibitions were generally contrasted utilizing many tweets and mark positive, negative, and unbiased. The crude tweets were taken from Sentiment140 informational index. At that point, those are pre-prepared and named utilizing a python program. Every one of these classifiers was presented to duplicate information. The exact calculation of highlight choice, dimensionality decrease, and k-overlay approval was used in each case. The measures were looked at depending on the preparation time, expectation time, and forecast's exactness. The trial result is given below.

Table 1: Comparison between Gaussian NB, SVM and Decision Tree

Algorithm	Training Time (Sec.)	Prediction Time (Sec.)	Accuracy
Naïve Bayes (Gaussian)	2.708	0.328	0.692
SVM	6.485	2.054	0.6565
Decision Time	454.609	0.063	0.69

However, a calculation's effectiveness reasonably relies upon the informational index and the area it is applied. Under certain conditions, an ML calculation may beat the other.

Applications

One obvious indicator of ML progression is its significant genuine applications, some of which are momentarily portrayed here. It is to be noticed that until 1985 there was no considerable business utilization of ML calculations.

A. Speech Recognition

All current discourse acknowledgment frameworks accessible in the market using AI to train the framework for better exactness. By and by, the vast majority of such frameworks carry out learning in two unmistakable stages: pre-transportation speaker-independent preparing and post-delivery speaker-subordinate preparing [16].

B. Computer Vision

The lion's share of ongoing vision frameworks, e.g., facial acknowledgment virtual products, frameworks fit for programmed grouping minute pictures of cells, utilize AI approaches for better exactness. For instance, the US Post Office uses a PC vision framework with a penmanship analyzer prepared to sort letters written by hand addresses, consequently with a precision level as high as 85%.

C. Bio-Surveillance

Several government activities to follow plausible episodes of diseases uses ML calculations. Consider the RODS project in western Pennsylvania. This task gathers affirmations reports to trauma centers in the clinics there. The ML programming framework is prepared to utilize conceded patients' profiles in request to recognize variant indications, their designs, and areal dispersion. The examination is progressing to incorporate some extra information in the framework, as over-the-counter meds' buy history to give more training data. The intricacy of this sort of unpredictable and dynamic informational collection can be taken care of proficiently utilizing computerized learning techniques as it were.

D. Robot Or Automation Control

ML techniques are generally utilized in robot and computerized frameworks. For instance, think about the utilization of ML to acquire control strategies for stable flight and aerobatics of helicopters. Oneself driving vehicles created by Google uses to prepare from gathered territory information [17].

E. Empirical Science Experiments

An enormous gathering of information concentrated science disciplines uses ML techniques in a few of it explores. For instance, ML is being executed in hereditary qualities, distinguishing abnormal divine items in stargazing, neuroscience, and mental examination.

The other limited scope yet significant utilization of ML includes spam sifting, extortion recognition, subject recognizable proof, and proactive investigation (e.g., climate estimate, securities exchange forecast, market overview, and so forth)

Future Scope

AI is a research territory that has pulled in many splendid personalities and can be disclosed further. Yet, the three most significant future sub-issues are picked to be talked about here.

1) Explaining Human Learning

A referenced before, AI speculations have been perceiving fitting to comprehend learning features in people and creatures. Support learning calculations gauge the dopaminergic neurons actuated

exercises in animals during remuneration-based learning with fantastic precision. ML calculations for revealing sporadic delineations of typically showing up pictures anticipate visual highlights distinguished in creatures' underlying visual cortex. In any case, the significant drivers in human or animal learning like incitement, frightfulness, criticalness, hunger, natural activities, and learning by preliminary furthermore, blunder throughout various time scales, are not yet considered in ML calculations. This an expected chance to find a more summed up idea of discovering that entails both creatures and machines [18-21].

2) Programming Languages Containing Machine Learning Primitives

ML calculations are joined with physically coded programs as part of application programming in the majority of uses. The need for another programming language that is independent to help physically composed subroutines and those defined as "to be learned." It could enable the coder to define a set of sources of info yields of each "to be learned" program and opt for a calculation from the gathering of fundamental learning methods already granted in the language. Yet, a fascinating new inquiry is raised as to develop a model to define relevant learning experience for every subroutine labeled as "to be mastered," timing, and security in instance of any unforeseen modification to the program's function.

3) Perception

A summed-up idea of PC perception that can interface ML calculations used in various types of PC insight today, including yet not restricted to profoundly progressed vision, discourse acknowledgment, and so forth, is another potential examination zone. One idea provoking problems the mix of different senses (e.g., sight, hear, contact, and so on) to set up a framework that utilizes self-regulated figuring out how to gauge one tactile knowledge using the others. Investigates informative brain research have noted more effective learning in humans when various input modalities are provided and concentrates on co-preparing techniques insinuate similar results.

Conclusion

ML analysts' main target is to plan more proficient (as far as both time and space)and helpful, broadly helpful learning techniques that can perform better over a boundless space. Regarding ML, the productivity with which a strategy uses information assets is also a significant execution worldview alongside time, what's more, space intricacy. Higher exactness of expectation and humanly interpretable forecast rules are likewise of high significance.

Being information-driven and looking at a lot of information in more modest time frames, ML calculations have the edge over manual or direct programming. Additionally, they are frequently more exact and not inclined to human predisposition. Think about the accompanying situations:

Advancement of a product to settle discernment errands utilizing sensors, similar to discourse acknowledgment, PC vision, and so forth. It is simple for anybody to mark a picture of a letter by the letters it means; however, planning a calculation to play out this undertaking is troublesome.

Customization of a product as per the climate it is conveyed. Consider discourse acknowledgment virtual products that must be redone as per the client's requirements, like internet business locales that reconditions the items shown by clients or email peruser that empowers spam recognition

according to client inclinations. Direct programming comes up short on the capacity to adjust when presented to various climates.

Disregarding some applications (e.g., to compose lattice duplication programs) where ML may neglect to be valuable, with an increment of information assets and expanding requests in customized customizable programming, ML will flourish in not so distant future. Other than programming improvement, ML will most likely yet help reform the general outlook of Computer Science. By evolving the characterizing question from "how to program a PC" to "how to empower it to program itself," ML cloisters the improvement of devices that are self-observing, self-diagnosing self-fixing, and the uses of the information stream accessible inside the program as opposed to simply preparing it. Similarly, it will help change Statistical principles by providing more computational positions. The two Statistics and Computer Science will likewise adorn ML to create and contribute more advanced theories to adjust the learning method.

References

- [1] Mahmud, U., Alam, K., Mostakim, M. A., & Khan, M. S. I. (2018). AI-driven micro solar power grid systems for remote communities: Enhancing renewable energy efficiency and reducing carbon emissions. *Distributed Learning and Broad Applications in Scientific Research*, 4.
- [2] Pasham, S.D. (2019) Energy-Efficient Task Scheduling in Distributed Edge Networks Using Reinforcement Learning. *The Computertech*. 1-23.
- [3] Manduva, V.C. (2020) How Artificial Intelligence Is Transformation Cloud Computing: Unlocking Possibilities for Businesses. *International Journal of Modern Computing*. 3(1): 1-22.
- [4] Alam, K., Mostakim, M. A., & Khan, M. S. I. (2017). Design and Optimization of MicroSolar Grid for Off-Grid Rural Communities. *Distributed Learning and Broad Applications in Scientific Research*, 3.
- [5] Agarwal, A. V., & Kumar, S. (2017, November). Unsupervised data responsive based monitoring of fields. In *2017 International Conference on Inventive Computing and Informatics (ICICI)* (pp. 184-188). IEEE.
- [6] Agarwal, A. V., Verma, N., Saha, S., & Kumar, S. (2018). Dynamic Detection and Prevention of Denial of Service and Peer Attacks with IPAddress Processing. *Recent Findings in Intelligent Computing Techniques: Proceedings of the 5th ICACNI 2017, Volume 1*, 707, 139.
- [7] Manduva, V.C. (2020) The Convergence of Artificial Intelligence, Cloud Computing, and Edge Computing: Transforming the Tech Landscape. *The Computertech*. 1-24.
- [8] Agarwal, A. V., & Kumar, S. (2017, October). Intelligent multi-level mechanism of secure data handling of vehicular information for post-accident protocols. In *2017 2nd International Conference on Communication and Electronics Systems (ICCES)* (pp. 902-906). IEEE.
- [9] Pasham, S.D. (2017) AI-Driven Cloud Cost Optimization for Small and Medium Enterprises (SMEs). *The Computertech*. 1-24.
- [10] Goriparthi, R.G. (2020) Neural Network-Based Predictive Models for Climate Change Impact Assessment. *International Journal of Machine Learning Research in Cybersecurity and Artificial Intelligence*. 11(1): 421-421
- [11] Pasham, S.D. (2018) Dynamic Resource Provisioning in Cloud Environments Using Predictive Analytics. *The Computertech*. 1-28.
- [12] Inaganti, A. C., Sundaramurthy, S. K., Ravichandran, N., & Muppalaneni, R. (2020). Cross-Functional Intelligence: Leveraging AI for Unified Identity, Service, and Talent Management. *Artificial Intelligence and Machine Learning Review*, 1(4), 25-36.

- [13] Nersu, S. R. K., Kathram, S. R., & Mandalaju, N. (2020). Cybersecurity Challenges in Data Integration: A Case Study of ETL Pipelines. *Revista de Inteligencia Artificial en Medicina*, 11(1), 422-439.
- [14] Srinivas, N., Mandalaju, N., & Nadimpalli, S. V. (2020). Cross-Platform Application Testing: AI-Driven Automation Strategies. *Artificial Intelligence and Machine Learning Review*, 1(1), 8-17.
- [15] Mandalaju, N., Srinivas, N., & Nadimpalli, S. V. (2020). Machine Learning for Ensuring Data Integrity in Salesforce Applications. *Artificial Intelligence and Machine Learning Review*, 1(2), 9-21.
- [16] Manduva, V.C. (2020) AI-Powered Edge Computing for Environmental Monitoring: A Cloud-Integrated Approach. *The Computertech*. 50-73.
- [17] Agarwal, A. V., Verma, N., & Kumar, S. (2018). Intelligent Decision Making Real-Time Automated System for Toll Payments. In *Proceedings of International Conference on Recent Advancement on Computer and Communication: ICRAC 2017* (pp. 223-232). Springer Singapore.
- [18] Ravichandran, N., Inaganti, A. C., Muppalaneni, R., & Nersu, S. R. K. (2020). AI-Driven Self-Healing IT Systems: Automating Incident Detection and Resolution in Cloud Environments. *Artificial Intelligence and Machine Learning Review*, 1(4), 1-11.
- [19] Ravichandran, N., Inaganti, A. C., Muppalaneni, R., & Nersu, S. R. K. (2020). AI-Powered Workflow Optimization in IT Service Management: Enhancing Efficiency and Security. *Artificial Intelligence and Machine Learning Review*, 1(3), 10-26.
- [20] Pasham, S.D. (2020) Fault-Tolerant Distributed Computing for Real-Time Applications in Critical Systems. *The Computertech*. 1-29.
- [21] Inaganti, A. C., Sundaramurthy, S. K., Ravichandran, N., & Muppalaneni, R. (2020). Zero Trust to Intelligent Workflows: Redefining Enterprise Security and Operations with AI. *Artificial Intelligence and Machine Learning Review*, 1(4), 12-24.