Journal of Data Acquisition and Processing
ISSN: 1004-9037
https://sjcjycl.cn/
DOI: 10.5281/zenodo.7922961

DISTINGUISHING AND DEVELOPING PREDICTIVE MODELS USING MACHINE LEARNING ALGORITHMS FOR ENHANCING SALES

Ms Shruti Sharma
CEO, Brindavan Group of Institution, Bangalore-63.
ceo@brindavancollege.com

ABSTRACT: In today's world, innovation is most significant in each field. In every single field the PC innovation is utilized. One of the field in which we use innovation is in the deals division. In outreach group, we distinguish and foster a prescient models ie., objects recognition and expectation. Precious examination aids in the discovery of new business areas for products and services. Recognizing organization's best clients and foreseeing client agitate are two qualities of prescient examination. It is crucial to observe elective techniques which are more straightforward to execute and work with different datasets, less expensive, that can deliver a more dependable forecast. Our project is joined of a few Al calculations which incorporate YOLO for the item recognition LOGISTIC Relapse for the forecast. Providers in business-to-business showcases progressively are looking for development by giving start to finish answers for clients. There are three all-encompassing sorts of uncertainties among clients. Figuring out what prescient displaying strategies are best for our organization is critical to taking advantage of a prescient examination arrangement and utilizing information to settle on canny choices. Prescient investigation calculations attempt to accomplish the most minimal blunder conceivable by either utilizing helping or sacking subsets. Thus, in our undertaking we will utilize different machine learning calculations for object identification, harm discovery and forecast of the items.

INTRODUCTION

The sales team of any organization is important to its overall success. When a potential client expresses a desire for a product or service that the company does not currently offer, salespeople play a crucial role in connecting the dots between the customer's demands and the company's ability to deliver. Here are some of the most important ways in which sales influence a business's success.

BUSINESS GROWTH:

Sales are crucial to establishing credibility and gaining the trust of customers. There are numerous motivations for customers to recommend your company to others or to provide a favourable review of your product or service online.

BETTER BUSINESS GROWTH:

A nice shop, amazing items, and a cute mascot are all nice, but without sales, they're just an expense that leads to losses. Sales come from a multitude of places, and most business owners have distinct marketing tactics for each one. An internet sales funnel, for example, might offer things without the need for a salesperson the speed with which the order is filled, on the other hand, is what helps cement the deal. This is significant because sales create income, which covers the costs of the store, merchandise, and mascot. When the proprietor can expand sales without significantly raising per-sale expenses, a company's size, margin, and profitability all

increase. Business owners may be able to gain discounts for their products or services by taking advantage of economies of scale)

SALES LEAD CONVERSIONS:

As discussed previously, salespeople function as the "bridge" between consumers and the goods and services that can meet their needs. Usually, when salespeople speak with prospective clients, those buyers have already been won over by the company's advertising. It is the responsibility of the salesman to complete the deal by giving extra information and supporting the customer's ability to create appropriate connections.

Lower Customer Turnover: As previously said, strong customer service converts potentially unhappy customers into pleased customers. Client retention however, involves more than just revenue retention, Owners of businesses must consider the sales process in terms of the customer experience. If the sales process is going well. Good and overall, the client experience is positive. Once the sale has been completed and the funds have been received. Even after the purchase price has been paid, the selling continues. The delivery is the next phase. It may be as simple as that. Presenting the product in a professional manner and giving it on to the customer, It may appear straightforward, however consider the following

When you ordered exquisite cupcakes and the cashier simply placed them in the bag. The frosting smeared the bag's sides. Consider personal delivery or shipment through a third party. Recently, there has been a lot of fascinating work in the area of using Machine Learning Algorithms to analyse price trends and predict stock price production. Some well-known machine learning techniques include k-nearest neighbours (KNN) and convolution neural networks (CNN), as well as artificial neural networks (ANN), naive bayes; and support vector machines. Detecting objects is a crucial element of computer vision. Detecting objects is a major focus in the field of computer vision. Object detection is a method used to recognize things like computers, plates of food, and people. At the instance level, it is used to identify the type of object of interest and its precise placement in the image. Each person has his or her own tastes when it comes to acquiring goods on the market. As a result, it is necessary to forecast the most popular commodities for the following day. This allows us to determine which products are likely to be purchased by customers and which are not. This aids in the growth of the business by increasing sales. In our project, we'll use YOLO for object recognition and Machine Learning to anticipate whether to boost or reduce stock production rates. This project entails applying Machine Learning algorithms such as Clustering to estimate demand for a product with new features based on past Demand data available for similar and currently existing items. It is critical to comprehend the question before choosing the algorithms and performance indicators. Because the target, Item Outlet Sales, is a continuous variable rather than a discrete problem, we are working with a regression problem.

1. Supervised Learning: The data is provided with data labels along with the target variable at hand.
2. Plain Batch Learning: This is not a time-series data and new data can be incorporated easily without changing the data much.

3. Performance Measure: Being a regression problem where we fit a line. Root Mean Square Error (RMSE) is an appropriate measure for our problem

WORKS IN CONNECTION

Tensorflow and OpenCV are used to detect ID cards with facial recognition. M. Kushal, B.V. Kushal, MJ. Charan, and M.Pappa Kushal. in this technique can detect whether or not a person is carrying an ID card. The technique of "object detection" through the use of tensor flow is what allows this to happen. Face detection is the procedure of checking a picture for the presence of a face and, if one is present, providing the image coordinates where the beginning can be found. Data collecting, gathering photographs with and without faces, training the system with the characteristics of the positive and negative images, and testing the system are all necessary steps in face detection Recognizing faces and creating XML documents there are two possible outcomes under this system: (1) the individual is carrying an ID card, and (2) the individual is not carrying an ID card. The suggested work uses object detection with the tensor flow to ascertain whether or not a person is carrying an ID card. A green square will appear around the person's ID card if the system detects they are holding one. A second scenario is a person who does not have proper identification. Things progress from there. A failed ID check-in Step 1. In the second stage. find the face in the picture. Third, locate the face in the image. In the fourth stage, get the individual's data. The proposed mode's capacity to identify valid ID cards and individual faces were assessed. Models were tested and trained using the Tensor Flow Object Detection API, with features supplied for ID card detection, face detection using the Harrcascade classifier, and face recognition using
the LBPH approach. **Based on an Improved Mask, a Vehicle-Damage-Detection Segmentation Algorithm Qinghui Zhang. Xianing Chang, and Shanfeng Bian Bian are members of the RCNN.**

He concludes that the disruption to regular travel is big enough to warrant more research into precise and effective ways to deal with it, like the ones he suggests. This study shows how a method based on deep learning can be used to find damage to a vehicle and solve the problem of making up for it after a crash. It is best to use a vehicle-damage detection segmentation technique based on transfer learning and an improved mask regional convolutional neural network to deal with traffic accident compensation issues (Mask RCNN), Mask RCNN is so improved version of Faster RCNN that is used to divide instances into groups. In the first phase, the image is looked at, and a proposal is made. In the second phase, the proposal is sorted, and a mask and bounding box are made. This paper uses transfer learning and Mask RCNN analyse and recognize image that show damage. This is done to cut down on time it takes to label datasets and to make it easier to find damage in photos of cars. Mask RCNN improves performance in terms of both detection (2.13%) and mask (1.89%), as well as running speed (40.52 fps) It's clear that the improved algorithm works better because not only is it more accurate, but it also takes less time to make a detection, So, when it comes to figuring out where damage is on a vehicle, the improved method shows a lot of strength and flexibility By comparing experimental data, we can see that it is hard to find the damaged part of the car when using the original Mask RCNN and high exposure. Even though this study uses the robust

Mask RCNN technique, which is an improvement on the old method and gives good experimental results, there are still some questions that need to be answered.

METHODOLOGY

The suggested approach begins by taking an image and feeding it into the YOLOv3 algorithm, which is then used to generate a final output using COCO datasets. The output of YOLOv3 was then employed in Logistic Regression to forecast the level of popularity of the observed object

YOLOv3 Object Detection Algorithm.

The YOLO algorithm is given a picture to start the process, YOLOV3 enlarges the picture to a new size of 416 x416 pixels. The YOLOv3 neural network has 106 layers, including residual layers, up-sampling layers, and skip shortcut connections. The YOLOV3 method takes an image and turns it into a tensor. This tensor has the coordinates of the boundary boxes, the probability that each boundary box contains an object, and the class of the object. Boxes with a probability value of less than 0.5 are ignored and filtered out. The remaining wrongly predicted boundary boxes are filtered out using a non-max suppression procedure. For detection, weights from the COCO dataset that had already been trained were used.

Bounding Box forecasting

Anchor frames are created by YOLOv3 using a package of dimensions. Because YOLOv3 is a standalone network each user has to check on their own to see if the network has lost its objectivity and allocation YOLOV can predict an objectivity score based on the first time that a process's selection rectangle completely overlaps the object of the essential truth. This is done with the help of logistic regression.

Class prediction

Almost every classifier assumes that all of the output labels are unique. Because of this, the true object classes are the ones that are exclusive. So, YOLO uses a soft-max function to turn the scores into one-to-one probabilities.YOLOv3 employs a tag-based multiple classification system.

Predictions across scales

Forecasting is done on three different scales. This grading is used in conjunction with FPNs to glean useful features. Darknet-53's basic function extractor [5] combines several convolutional layers. Class projections, delimitation tables, and objectivity are among the ultimate tiers. The COCO data set has three tables for each scale.

Feature Extractor: Darknet-53

We encode variables, outer values, input missing values, and take every possible effort to remove discrepancy in the data set during this phase, and it partitions the given data set into training and test data.

Machine Learning Algorithm

We employed a supervised learning technique in our research. We did, in fact, utilise the Logistic Regression machine learning algorithm. Logistic Regression was used to carry out the classification procedure (LR). Like every other machine learning method, LR requires a hypothesis and a cost function.

Reading Data

We built our own dataset for our project. In the experiment phase, we first looked at the characteristics created dataset. We used an internet product list with the Cross Validation Method to select features.

Pre-processing

During this stage, the provided dataset is split into training and test data, and we encode variables, outer values, in put missing values, and make every effort to eliminate discrepancy in the dataset.

The process of feature selection involves zeroing in on the characteristics of your data that have the greatest bearing on your desired prediction variable or outcome. However, many models, especially linear ones like linear and logistic regression, have problems with noise in the data. Below are three gains you'll experience if you wrap up feature selection and go on to modeling your data first: Reduces Over fitting: Fewer instances of duplicate information reduce the likelihood that inferences will be relied on chance alone.

As a result of fewer misleading data, model accuracy increases. Over fitting is mitigated since fewer redundant Observations mean fewer false positives.

Due to fewer misleading data, the precision of models improves. Reduces Training Time: With fewer data, algorithms can be train faster.

Classifier:

Logistic regression is essentially a supervised classification method. The output (or target) variable y in a classification issue has a finite number of possible values depending on the qualities being classified (or inputs). It is a common misconception that logistic regression is not a type of regression model.

Ensemble Method:

In this stage we have first implement YOLOv3 and detected the object. Then with the help of logistic algorithm on the dataset we will predict the popularity level of detected object.

A. The popular YOLO (You Only Look Once) method for finding objects now has a new version called YOLOV3. The model that was shown can find 80 different things in photos and videos. It is also faster and more accurate than Single Shot MultiBox (SSD).

B. Logistic Regression: The logistic regression formula is derived from a straight line's conventional linear equation. The logistic regression formula is derived from the classic linear

formula. For estimating the class of a binomial target characteristic, the logistic regression function is effective.

RESULTS AND DISCUSSIONS

In our project we proposed Machine Learning Algorithms for Enhancing Sales with YOLOv3 and Logistic Regression and detection of products. We pre-processed a dataset of products using a standardization method, and then used appropriate COCO datasets to identify products such as office supplies, electronics, and more. We use Logistic Regression to predict the outcome. These criteria were employed in the assessment process:

False Positive (FP): An input without object category is incorrectly diagnosed as product is popular.
False Negative (FN): An input with object category is incorrectly diagnosed as product is not popular.
True Positive (TP): Its means product is popular. True
Negative (TN): Its means product is not popular.

CONCLUSION:

We used and advocated the usage of the YOLO and Logistic regression algorithms for object detection because of their benefits. This method may be used in a variety of industries to tackle real-world problems such as security, traffic lane monitoring, and even aiding visually impaired persons via aural feedback. We've developed a model for detecting items that can be scaled up to identify large numbers of objects.

ACKNOWLEDGMENTS

Sincere thanks to all the co-authors for their support and coordination in carrying out this work.

REFERENCES

1. Md. Kamrul Hasan Md. Ashraful Alam, Dola Das, Eklas Hossain, Mahmudul Hasan," Diabetes Prediction Using Ensembling of Different Machine Learning Classifiers", vol. 08, pp. 76516-76531, April 2020
2. Madhusmita Rout, Amandeep Kaur," Prediction of Diabetes Risk based on Machine Learning Techniques, United Kingdom, August 06 2020
3. M. Kushal, Kushal Kumar B.V., Charan Kumar MJ., M. Pappa, "ID Card Detection with Facial Recognition using Tensorflow and OpenCV". Coimbatore, India, September 01 2020.
4. Qinghai Zhang, Xining Chung, Shanfeng Bian Bian." Vehicle-Damage-Detection Segmentation Algorithon Based on Improved Mask RCNN", vol. 08, pp.6997-7004, January 06 2021.
5. Rahuman MM. Li C, Yao Y, Kulwa F, Rahman MA, Wang Q. Qi S, Kong F, Zhu X, Zhao X. Identification of COVID-19 samples from chest X-Ray images using deep learning: A comparison of transfer learning approaches. J Xray Sci Technol. 2020:28(5):821-839. doi: 10.3233/XST-200715. PMID: 32773400; PMCID: PMC7592691.

6. Aishwarya T, Ravi Kumar V. Machine Learning and Deep Learning Approaches to Analyze and Detect COVID-19: A Review. SN Comput Sci. 2021;2(3):226. doi: 10.1007/-42979-021-00605-9. Epub 2021 Apr 20. PMID: 33899005;PMCID: PMC8056995.
7. Painuli D, Mishra D, Bhardwaj S, Aggarwal M. Forecast and prediction of COVID-19 using machine learning. Data Science for COVID-19. 2021:381-397. doi:10.1016/B978-0-12-824536-1,00027-7Pahar M, Klopper M, Warren R. Niesler T. COVID-19 cough classification using machine learning and global smartphone recordings. Comput Biol Med. 2021 Aug;135:104572. doi: 10.1016/j.compbiomed.2021.104572. Epub 2021 Jun 17. PMID: 34182331; PMCID:PMC8213969.
8. RafidMostafiz, Moharumad ShorifUddin, Nur-A- Alam, Md. Mahfuz Reza, Mohammad Motiur Rahman, Covid-19 detection in chest X-ray through random forest classifier using a hybridization of deep CNN and DWT optimized features, Journal of King Saud University Computer and Information Sciences, 2020, ISSN 1319-1578. hps:/doi.org/10.1006203012010
9. Mohammed, E.A., Keyhani, M., Sanati-Nezhad, A. et al. An ensemble learning approach to digital corona virus preliminary screening from cough sounds. Sci Rep 11, 15404 (2021). https://doi.org/10.1038/s41598-021-95042-2.
10. Brunese L, Martinelli F, Mercaldo F. Santone A. Machine learning for coronavirus covid-19 detection from chest x-rays. Procedia Comput Sci. 2020;176:2212-2221. doi: 10.1016/j.procs 2020.09.258. Epub 2020 Oct 2. PMID: 33042308;PMCID: PMC7531990.
11. Thara, D. K., and B. G. Premasudha. "A Review On Computer Aided Diagnosis Of Epilepsy Using Machine Learning And Deep Learning." URAR-International Journal of Research and Analytical Reviews (URAR), E-ISSN (2018): 2348-1269.
12. Sumayh S. Aljameel, Irfan Ullah Khan, Nida Aslam, Malak Aljabri, and Eman S. Alsulmi, Machine Learning-Based Model to Predict the Disease Severity and Outcome in COVID-19 Patients, Hindawi, Scientific Programming, 2021.