

ML +

# BLUE BOOK

DATA SCIENCE CASES

47 PROJECTS

COMPREHENSIVE GUIDE

INCLUDES  
INDUSTRY REFERENCES

# EMAIL SPAM DETECTOR

## objective

To classify an email as spam or not based on various characteristics of the email like words in heading, sender email etc.

## industries

Email Services

## use case

The world is getting digital and with digitization, the data security and privacy issues are rising day by day. Lot of applications ask permissions to share personal information like contact number and email ID

Further these email ids are used for promotions and advertisings. In a day to day life a user gets plenty of mails. Some of these mails are authentic while some of the mails are not of any use

They are simply the promotional and advertising emails which a user might not like to receive

Email spam detection is very important. By detecting unsolicited and unwanted emails, we can prevent spam messages from creeping into the user's inbox, thereby improving user experience

## algorithms

Logistic Regression, Classification Algorithms

## solved solutions

<https://towardsdatascience.com/spam-detection-in-emails-de0398ea3b48>

<https://the cleverprogrammer.com/2020/05/17/email-spam-detection-with-machine-learning/>

<https://towardsdatascience.com/email-spam-detection-1-2-b0e06a5c0472>

## companies

Google (Gmail), Yahoo

# FACE MASK DETECTOR

## objective

To detect whether the person on the webcam is wearing a mask or not

## industries

Corporate offices, retail stores, public transportation

## use case

Face masks were initially used by people to protect themselves from dust, dirt and for surgeries. But pandemic has completely changed its purpose, now masks are used for safety of people, to protect oneself from COVID-19 virus. It has become extremely important for some businesses to ensure that the people entering their premises have face masks. An application which can keep a check on people whether they are wearing masks or not is extremely important now.

## algorithms

CNN (OpenCV ,Tensorflow)

## solved solutions

<https://data-flair.training/blogs/face-mask-detection-with-python/>

<https://www.pyimagesearch.com/2020/05/04/covid-19-face-mask-detector-with-opencv-keras-tensorflow-and-deep-learning/>

<https://github.com/chandrikadeb7/Face-Mask-Detection>

## companies

leewayhertz, Cisco

# CHATBOT

## objective

To enable a software to communicate via text or text-to-speech. It aims at providing an experience of communication with a human being.

## industries

E-commerce, Banking, Travel agencies

## use case

Customer Support and Engagement - answer repetitive questions, help visitors navigate the website, first tier support

Sales and Marketing – make personalized recommendations, support front line sales and leads generation, facilitate email collection and marketing campaigns, provide customer access to information

Helps Employees – Serve as HR assistant, Serve as project support.

## algorithms

RNN(special kind of RNN,LSTM), Multinomial Naive Bayes

## solved solutions

<https://data-flair.training/blogs/python-chatbot-project/>

<https://the cleverprogrammer.com/2020/11/01/chatbot-with-machine-learning-and-python/>

## companies

DogTown Media, Unibot, Neoteric

# MOVIE RECOMMENDATION SYSTEM

## objective

To predict and suggest the movie preference for a user based on past behavior

## industries

OTT platforms, YouTube

## use case

The recommendation systems are used by OTT platforms now a days in order to provide customers with movie of their choices based on what they have seen earlier, or about the interests of a user by collecting preferences or taste information from many users. It provides better experience to the customer. The customer would be loyal to the company. If he/she gets relevant content he will spend more time on the website/app

## algorithms

Content filtering, Collaborative filtering, Social filtering

## solved solutions

<https://the cleverprogrammer.com/2020/05/20/data-science-project-movie-recommendation-system/>

<https://www.mygreatlearning.com/blog/masterclass-on-movie-recommendation-system/>

<https://data-flair.training/blogs/data-science-r-movie-recommendation/>

## companies

Netflix, Amazon prime videos, Voot

# CREDIT CARD FRAUD DETECTION

## objective

To recognize fraudulent credit card transactions so that the fraud transactions can be declined and the customers or credit card company don't get charged for items that they did not purchase

## industries

Banking, FinTech, Healthcare, E-commerce

## use case

Credit card fraud leads to losses of billions of dollars for a financial company and customers every year. The attacks and frauds are increasing at a very fast pace nowadays. A system capable of classifying the transaction as fraud is extremely important for the credit card company so that these fraud transactions can be declined. It will not only save money but will also provide trust to the customer. One more important point to note is that the system should be very efficient that it doesn't classify non-frauds to frauds. For e.g. If an authentic transactions is declined, the customer might get frustrated and churn out

## algorithms

Autoencoder model, Decision Trees, Logistic Regression, Artificial Neural Networks and , Gradient Boosting Classifier

## solved solutions

<https://data-flair.training/blogs/data-science-machine-learning-project-credit-card-fraud-detection/>

<https://the cleverprogrammer.com/2020/06/10/credit-card-fraud-detection-with-machine-learning/>

<https://www.geeksforgeeks.org/ml-credit-card-fraud-detection/>

## companies

ClearSale, Signifyd

# BREAST CANCER CLASSIFICATION

## objective

To diagnose patients and predict the likelihood of breast cancer so that it can be treated at an early stage itself

## industries

Healthcare

## use case

It becomes extremely difficult and expensive to treat a patient with breast cancer. Breast cancer is very common in slums and labor class. It is difficult for doctors to visit every patient and diagnose her reports. Hence a system which could predict the likelihood of a patient being infected with breast cancer would assist the doctors and they can pay attention to the patients which are more prone to it and they can be treated before it's too late

## algorithms

Classification algorithms – Logistic Regression, Decision Tree Classifier, Random Forest Classifier, XGBoost Classifier etc.

## solved solutions

<https://towardsdatascience.com/building-a-simple-machine-learning-model-on-breast-cancer-data-eca4b3b99fa3>

<https://thecleverprogrammer.com/2020/11/14/breast-cancer-detection-with-machine-learning/>

## companies

MIT, MGH

# STOCK PRICE PREDICTION

## objective

To predict the prices of stocks in future based on it's past performance and other characteristics, keeping in mind the competition characteristics

## industries

Financial market, Investment Bankers

## use case

Stock price prediction is extremely important for an investing company as they can make huge profits in the stock market. However its very difficult to predict the stock price as it depends on a lot of factors and sentiments of the markets. It helps investors to set the stop losses and targets for the intra-day trading as well

## algorithms

Linear regression, KNN, Auto ARIMA, LSTM

## solved solutions

<https://www.analyticsvidhya.com/blog/2018/10/predicting-stock-price-machine-learningnd-deep-learning-techniques-python/>

<https://thecleverprogrammer.com/2020/11/14/stock-price-prediction-using-machine-learning/>

## companies

Goldman Sachs, Future First

# TRAFFIC SIGN RECOGNITION

## objective

To interpret and understand the traffic signs like speed limits, no entry, turn left or right, children crossing, no passing of heavy vehicles, etc

## industries

Automobile

## use case

Automobile companies are trying very hard to achieve level 5 autonomous driving where a car can self drive itself. In order to enable a car to self drive, it's extremely important that the car understands the traffic signs. There are various traffic signs like speed limit, no entry, turn left/right, children crossing etc. So a system which could classify the sign into these classes is a must for a self driving car

## algorithms

Computer Vision, CNN, Object Detection, YOLO

## solved solutions

<https://data-flair.training/blogs/python-project-traffic-signs-recognition/>

<https://towardsdatascience.com/recognizing-traffic-signs-with-over-98-accuracy-using-deep-learning-86737aedc2ab>

## companies

Tesla, Uber, Google, Mercedes-Benz, Toyota, Ford, Audi

# NUMBER PLATE DETECTION

## objective

To detect the license/number plate of a car

## industries

Vehicle surveillance.

## use case

Traffic control and identification of vehicle owners have become a major concern today all over the world. Usually in busy roads, it becomes difficult to identify a vehicle owner who is breaking the rules of the road and driving too fast. In order to catch the culprit, a system which could detect and read the number plate of car/truck is very important, so that the police can punish them appropriately

## algorithms

CNN, YOLO, Object Detection

## solved solutions

<https://thecleverprogrammer.com/2020/12/24/number-plate-detection-with-python/>

<https://towardsdatascience.com/number-plate-detection-with-supervised-and-tensorflow-part-1-e84c74d4382c>

<https://aihubprojects.com/real-time-number-plate-recognition-system/>

## companies

Siemens AG, Q-Free ASA, Genetec Inc.

# RESUME SCREENING SYSTEM

## objective

To screen objectively thousands of resumes in few minutes without bias to identify the best fit for a job opening based on thresholds, specific criteria or scores

## industries

Hiring Assistance Companies

## use case

Hiring the right talent is a challenge in today's world. This challenge is further magnified by the high volume of applicants. Companies do not get enough time to go through the CVs of all applicants. Hence a system which could go through lot of resumes in a very short time and shortlist the resumes which fits well for a job based on parameters set by the interviewer is extremely important. It minimizes the human interference and bias as well

## algorithms

Core Python, NLP

## solved solutions

<https://the cleverprogrammer.com/2020/12/06/resume-screening-with-python/>

<https://www.kaggle.com/dhainjeamita/resume-classification>

## companies

Hilton, Humana, ThredUp

# TEXT SUMMARIZATION

## objective

To summarize text to produce a concise and fluent summary while preserving key information content and overall meaning

## industries

Press, Conferences

## use case

Today, lots of data resides in the digital space, and it's very difficult to go through them manually. Generally the leadership of companies or editors don't have time to go through the whole press release, conference, news or reviews. They just want to have a look at the summary of it. Manual text synthesis is a long and laborious task, and also creates an inaccurate and fluid summary containing only the main points. Hence, a system which could summarize the text to produce a concise and fluent summary while preserving key information content and overall meaning is extremely important

## algorithms

Sequence-to-Sequence modelling

## solved solutions

<https://the cleverprogrammer.com/2020/08/24/summarize-text-with-machine-learning/>

<https://www.analyticsvidhya.com/blog/2019/06/comprehensive-guide-text-summarization-using-deep-learning-python/>

## companies

Resoomer

# NEXT WORD PREDICTION

## objective

To predict the next word while writing

## industries

Social Media Platforms, Digital Keyboard Industries, Search Engines

## use case

Most of the keyboards in smartphones give next word prediction features based on browsing history. It reduces number of keystrokes needed and it reduces writing fatigue. It gives a better experience to the user

## algorithms

LSTM, NLP

## solved solutions

<https://the cleverprogrammer.com/2020/07/20/next-word-prediction-model/>

<https://towardsdatascience.com/next-word-prediction-with-nlp-and-deep-learning-48b9fe0a17bf>

## companies

Google, TouchType Ltd., Rokusek.

# WHATSAPP CHAT ANALYSIS

## objective

To analyze WhatsApp chats and get insights

## industries

Social media

## use case

Analyze the weekly trends of messages, WhatsApp usage trend across days of weeks.

Extract out the most used words from a person

Get most active hours of the day

Extract the top emojis used.

Find interactions with other users (how many users is he talking on a daily/weekly basis

## algorithms

TF-IDF, NLP, Exploratory Data Analysis

## solved solutions

<https://towardsdatascience.com/how-to-use-nlp-to-analyze-whatsapp-messages-1adf0e85907c>

<https://the cleverprogrammer.com/2020/07/16/nlp-for-whatsapp-chats/>

## companies

WhatsApp Inc.

# INSTAGRAM FILTERS GENERATION

## objective

To generate filters for Instagram

## industries

Social media

## use case

To improve quality of images.  
Make the images attractive.  
Used to get different shades of same picture..

## algorithms

Computer vision( instafilter library).

## solved solutions

<https://thecleverprogrammer.com/2020/09/24/instagram-filters-with-python/>

<https://towardsdatascience.com/python-opencv-building-instagram-like-image-filters-5c482c1c5079>

## companies

Instagram

# HATE SPEECH DETECTION

## objective

To detect hate speech/ offensive speech from a certain piece of text.

## industries

Social media

## use case

It is often used by social media companies to distinguish toxic content from healthy news

It helps to reduce any conflict due to harsh news.

It prevents toxic environment on social media by keeping away the users from any negative comments.

## algorithms

SGD classifier

## solved solutions

<https://thecleverprogrammer.com/2020/08/19/hate-speech-detection-model/>

<https://medium.com/rajapintaco/hate-speech-detection-with-machine-learning-fd104042cb4f>

## companies

Google, Facebook

# TEXT CLASSIFICATION

## objective

To assign a set of predefined categories to a text document

## industries

E-commerce, News Agencies, Content Curation.

## use case

Tagging content or products using categories as a way to improve browsing or to identify related content on your website. Platforms such as E-commerce, news agencies, content curators, blogs, directories, and likes can use automated technologies to classify and tag content and products.

Help marketers research and analyse tags and keywords used by competitors.

Automate CRM tasks

A faster emergency response system can be made by classifying panic conversation on social media. Authorities can monitor and classify emergency situation to make a quick response if any such situation arises. This is a case of very selective classification.

## algorithms

Multinomial Naïve Bayes, NLP

## solved solutions

<https://thecleverprogrammer.com/2020/05/14/text-classification-with-data-science/>

<https://www.analyticsvidhya.com/blog/2018/04/a-comprehensive-guide-to-understand-and-implement-text-classification-in-python/>

## companies

Amazon, Google, Facebook, LinkedIn

# DNA SEQUENCING

## objective

To predict a gene's function based on the DNA sequencing of the coding sequence alone

## industries

Healthcare

## use case

It's required for researchers to be able to "read" the genetic blueprint that directs all the activities of a living organism and for that DNA sequencing is required.

## algorithms

Collaborative filtering, Content filtering

## solved solutions

<https://the cleverprogrammer.com/2020/05/23/dna-sequencing-with-machine-learning/>

<https://github.com/krishnaik06/DNA-Sequencing-Classifier>

## companies

Illumina, Agilent Technologies

# TITLE GENERATOR

## objective

To generate titles for videos or blogs

## industries

Social Media, EdTech, Blogging Companies

## use case

Create titles for YouTube videos

The main purpose of a title is to entice people to make them read your work. A good title helps in garnering all the attention that your article deserves. It can be used to generate catchy titles for blogs, novels

## algorithms

LSTM

## solved solutions

<https://the cleverprogrammer.com/2020/10/05/title-generator-with-machine-learning/>

<https://github.com/csinva/gpt2-paper-title-generator>

<https://github.com/AngusTheMack/title-generator>

## companies

Namelix

# BOOK RECOMMENDATION SYSTEM

## objective

To predict and suggest the book preference for a user based on past behavior

## industries

E-books Industries

## use case

This recommendation system is used by e-book apps now a days in order to provide customers with books of their choices based on what they have read earlier, or about the interests of a user by collecting preferences or taste information from many users. It provides better experience to the customer. The customer would be loyal to the company. If he/she gets relevant content he will spend more time on the website/app.

## algorithms

Collaborative filtering, Content filtering.

## solved solutions

<https://the cleverprogrammer.com/2020/05/23/book-recommendation-system-with-machine-learning/>

<https://www.kdnuggets.com/2020/07/building-content-based-book-recommendation-engine.html>

<https://www.kaggle.com/tannergi/book-recommendation-system>

## companies

Amazon, Goodreads, Kwench

# EMOJI CREATION

## objective

To create emojis and avatars for a person

## industries

Cartoon Companies, Social Media

## use case

Emojis or avatars are ways to indicate nonverbal cues. These cues have become an essential part of online chatting, product review, brand emotion, and many more. It also leads to increasing data science research dedicated to emoji-driven storytelling. With advancements in computer vision and deep learning, it is now possible to detect human emotions from images

It is used extensively for marketing campaigns in order to increase sales as emojis are attractive enough to attract customers so boosting engagement

## algorithms

CNN

## solved solutions

<https://data-flair.training/blogs/create-emoji-with-deep-learning/>

<https://morioh.com/p/692d9ea33038>

## companies

Disney, Hike, Apple

# EARTHQUAKE PREDICTION

## objective

To predict earthquakes hours or days in advance, based on various demographics and geological features

## industries

Earth sciences, Weather agencies

## use case

With the emergence of technology, seismic monitoring systems have increased. Hence an earthquake prediction system is possible. Even though the accuracy is not very good yet, but still it's very useful. With the right prediction systems in place, preventive measures can be taken before hand

## algorithms

LSTM, CNN, Transformers

## solved solutions

<https://thecleverprogrammer.com/2020/11/12/earthquake-prediction-model-with-machine-learning/>

[https://github.com/GV1028/earthquake\\_prediction](https://github.com/GV1028/earthquake_prediction)

## companies

NASA, ISRO

# COVID-19 IMPACT DETECTION

## objective

To detect the impact of COVID-19 on lungs using X-ray images

## industries

HealthCare

## use case

Since the outbreak of COVID, many people lost their lives either due to delayed treatment or unavailability of the right tools to detect the extent of damage done by the virus. Since the availability of doctors is limited, it's the need of the hour to detect the presence of this virus in body of people and check the impact it has left on the lungs using an AI system. X-ray images in hospitals are being used in analyzing the impact on lungs

## algorithms

CNN

## solved solutions

<https://the cleverprogrammer.com/2020/07/09/covid-19-detection/>

<https://github.com/muhammedtalo/COVID-19>

## companies

ICMR, Serum Institute

# IMAGE CAPTION GENERATOR

## objective

To generate captions for image

## industries

Social media

## use case

With so much innovations and competitions in social media platforms, everyone is trying to provide better customer experience. One of the great innovation is caption generation for image. It provides recommendation for an image. It increases the user experience

## algorithms

CNN, LSTM

## solved solutions

<https://data-flair.training/blogs/python-based-project-image-caption-generator-cnn/>

<https://machinelearningmastery.com/develop-a-deep-learning-caption-generation-model-in-python/>

## companies

IBM CODAIT ,Google Photos, SkinVision

# RAINFALL PREDICTION

## objective

To predict the amount of rainfall over a region for a period of time

## industries

Meteorological Department, Weather Forecasting

## use case

It is important to exactly determine the rainfall for effective use of water resources for crop productivity

It is also used for pre-planning of water structures.

It helps in satellite launches

## algorithms

Regression algorithms – Linear Regression, Decision Tree Regressor, Random Forest Regressor, XGBoost Regressor

## solved solutions

<https://www.geeksforgeeks.org/ml-rainfall-prediction-using-linear-regression/>

## companies

Google, IBM

# CALORIES BURNED PREDICTION

## objective

To predict calories burnt based on various features like steps walked, sleeping time, workout duration etc.

## industries

Fitness Services, Health Monitoring System

## use case

It is used in various calories calculator available online that keeps track of how many calories one have lost in a day  
Online gyms and fitness websites which conduct online workout also use this system in order to create the stats for a session

## algorithms

Regression algorithms – Linear Regression, Decision Tree Regressor, Random Forest Regressor, XGBoost Regressor

## solved solutions

<https://thecleverprogrammer.com/2020/11/26/calories-burned-prediction-with-python/>

## companies

Cult Fit, Omnicalculator, Healthstatus, Google Fit

# MALWARE DETECTION

## objective

To predict whether a machine is infected with malware or not, based on various features like antivirus installed, operation system, country, etc.

## industries

Electronics, Networking

## use case

The malware industry is growing very fast. Once a machine is infected by malware, criminals can hurt the consumers in many ways. This problem needs to be taken very seriously. Hence, such a system which could predict whether a machine will be infected with malware or not is very important. If we get this information beforehand, the attack can be stopped.

## algorithms

Classification algorithms – Logistic Regression, Decision Tree Classifier, Random Forest Classifier, XGBoost Classifier

## solved solutions

<https://github.com/saicharanarishanapally/microsoft-malware-detection>

<https://www.kaggle.com/c/microsoft-malware-prediction>

## companies

Microsoft

# RESTAURANT RECOMMENDATION SYSTEM

## objective

To predict and suggest the restaurant preference for a customer based on past behavior

## industries

Online food ordering, Dine Out Brokers

## use case

These recommendation systems are used by online food ordering apps now a days in order to provide recommendation to the customers with restaurants of their choices based on what they have ordered earlier, or about the interests of a customer by collecting preferences or taste information from many users. It provides better experience to the customer. The customer would be loyal to the company. If he/she gets relevant content he will order more from the website/app

## algorithms

Content based filtering, collaborative filtering, Linear Regression, Logistic regression.

## solved solutions

<https://thecleverprogrammer.com/2020/11/18/restaurant-recommendation-system-with-python/>

<https://github.com/topics/restaurant-recommendation>

## companies

Zomato, Swiggy, DineOut

# IMAGE CARTOONIFY

## objective

To cartoonify an image or to convert the image to a cartoon

## industries

Animation, Social Media

## use case

Used by social media platforms for memes

Used by magazines for posters

## algorithms

OpenCV

## solved solutions

<https://data-flair.training/blogs/cartoonify-image-opencv-python/>

<https://www.geeksforgeeks.org/cartooning-an-image-using-opencv-python/>

<https://towardsdatascience.com/using-opencv-to-cartoonize-an-image-1211473941b6>

## companies

KapWing , All Ways Spain

# DEEPFAKE DETECTION

## objective

To identify the fake videos (deepfake) from the original ones

## industries

Social Media, News

## use case

It has been experienced so far that the Deepfake videos go easily viral at platforms like Facebook, twitter, YouTube, etc. These videos might spread rumors and negativity in the society. These videos are difficult to be detected with naked eyes. Hence, a detection system capable of classifying these videos is extremely important

## algorithms

MTCNN

## solved solutions

<https://thecleverprogrammer.com/2020/10/03/deepfake-detection-with-python/>

<https://www.kaggle.com/c/deepfake-detection-challenge>

## companies

Facebook

# MACHINE TRANSLATION MODEL

## objective

To automatically translate text from one language to another

## industries

Global Communications, Health care, E-commerce, Software, Finance

## use case

Global companies have customers and users from all around the world. It's very important to communicate with them in the language they are comfortable with. Hence such systems are very important which converts one language to another.

Even in global leaders meetings, not everyone understands English, so these systems are used for effective communication

## algorithms

RNN, CNN, NLP

## solved solutions

<https://thecleverprogrammer.com/2020/07/28/machine-translation-model/>

<https://towardsdatascience.com/neural-machine-translation-15ecf6b0b>

## companies

Google, Microsoft

# MUSIC GENRE CLASSIFICATION

## objective

To classify different music/audios to different genres

## industries

Music Streaming

## use case

Nowadays companies use music genre classifier to recommend their customers with music which helps in customer engagement  
It also makes it easy for users to find music of their taste and listen to them, without any disturbance of songs of different genre

## algorithms

SVM,K-means clustering, KNN ,CNN

## solved solutions

<https://data-flair.training/blogs/python-project-music-genre-classification/>

<https://towardsdatascience.com/music-genre-classification-with-python-c714d032f0d8>

## companies

Spotify, Soundcloud

# HANDWRITTEN WORDS RECOGNITION

## objective

To understand/recognize the hand written words present in the image

## industries

Financial services.

## use case

Lot of forms and applications are still offline. Paper medium is used for these documents. These documents are scanned and then these recognition systems are used to recognize what the user has written. Once the data is recognized and stored in a csv or txt file, it can be analyzed or used multiple ways

## algorithms

CNN, LSTM

## solved solutions

<https://data-flair.training/blogs/python-deep-learning-project-handwritten-digit-recognition/>

<https://machinelearningmastery.com/handwritten-digit-recognition-using-convolutional-neural-networks-python-keras/>

## companies

Captricity, Intsig, MicroBlink

# SPEECH EMOTION RECOGNITION

## objective

To recognize/classify human emotions and affective states from speech

## industries

Healthcare , Security, Entertainment

## use case

It is used to detect the emotions and mental state of a mentally depressed person in the hospital and treat him/her accordingly

It is used in security services, to identify if a person is lying or speaking the truth

It is used in interactive voice based-assistant or caller-agent conversation analysis.

## algorithms

MLP classifier, CNN

## solved solutions

<https://data-flair.training/blogs/python-mini-project-speech-emotion-recognition/>

<https://towardsdatascience.com/speech-emotion-recognition-with-convolution-neural-network-1e6bb7130ce3>

## companies

IBM, Google, Microsoft

# DROWSINESS DETECTION SYSTEM

## objective

To detect if a person's eyes are closed for a few seconds

## industries

Automotive, Electronics

## use case

Nowadays, we witness a lot of car accidents that take place , many of them due to reason that the drivers were sleepy. Hence a system which could detect if a person is sleeps is extremely important, as it will detect and raise an alarm to the user. It's very protective application for a driver.

It can be used to automatically lock the phone when a person is sleeping while watching a movie on phone

## algorithms

CNN

## solved solutions

<https://data-flair.training/blogs/python-project-driver-drowsiness-detection-system/>

<https://www.geeksforgeeks.org/project-idea-driver-distraction-and-drowsiness-detection-system-dcube/>

## companies

Hi-tech Robotic Systemz Ltd, Mercedes

# SIGN LANGUAGE RECOGNITION

## objective

To create a sign detector, which detects numbers from 1 to 10. This can very easily be extended to cover multitude of other signs and hand gestures including the alphabets

## industries

Education, Social Media

## use case

This system provides great assistance in understanding a specially abled person and teach him further  
It can be used as an effective way of communication with a special abled person

## algorithms

CNN

## solved solutions

<https://data-flair.training/blogs/sign-language-recognition-python-ml-opencv/>

<https://towardsdatascience.com/sign-language-recognition-using-deep-learning-6549268c60bd>

## companies

Google, Leap Motion

# CUSTOMER SEGMENTATION

## objective

To segment customers into logical groups as per their behavior

## industries

E Commerce, Retail, Finance

## use case

It is used by various industries to group the customer into groups based on various characteristics, it has lot of benefits like:

- Drive-Up Retention Rates
- Offer Well-Timed Discounts To Drive Sales
- Control Churns
- Make Yourself Visible During Key Times
- Beat The Competition

## algorithms

K-means, hierarchical clustering, DBSCAN

## solved solutions

<https://thecleverprogrammer.com/2020/07/12/customer-segmentation/>

<https://towardsdatascience.com/customer-segmentation-and-acquisition-using-machine-learning-a219ce0ec139#:~:text=Behavioural%20Segmentation,to%20behaviour%20or%20a%20person.>

## companies

Apicbase, VelvetJobs

# COVID-19 CONTACT TRACING

## objective

To identify the people who may have been infected by the patients diagnosed with COVID-19

## industries

Public health ministries

## use case

COVID-19 is one of the worst pandemic the world has seen. It spreads through air. So it's extremely important to identify the people who might have been in contact with the infected person so that they can be quarantined and treated. This will not only help them recover but will stop the further spread of virus to others

## algorithms

DBSCAN

## solved solutions

<https://thecleverprogrammer.com/2020/08/20/contact-tracing-with-machine-learning/>

<https://www.coursera.org/learn/covid-19-contact-tracing>

## companies

PwC, IBM

# PREDICT DIABETES

## objective

To predict diabetes in a patient

## industries

Healthcare

## use case

It is used for predicting diabetes which if predicted earlier can be controlled

Earlier detection of disease can help to prevent other serious linked diseases and severe consequences

## algorithms

KNN, Logistic Regression

## solved solutions

<https://thecleverprogrammer.com/2020/07/13/predict-diabetes-with-machine-learning/>

<https://towardsdatascience.com/end-to-end-data-science-example-predicting-diabetes-with-logistic-regression-db9bc88b4d16>

## companies

Hospitals

# GROCERY PRODUCT RECOMMENDER

## objective

To recommend products to customers based on past behavior and other characteristics

## industries

E-commerce

## use case

It is used to recommend products the customers might like to purchase based on his/her previous purchase history

Sometimes customers forget what all they were looking for. It helps them to remember these goods

It helps in suggesting and upselling complementary products (E.g. bread-butter, bread-jam). This helps in increasing revenue and also better buying experience

## algorithms

KNN, Logistic Regression

## solved solutions

<https://towardsdatascience.com/creating-a-grocery-product-recommender-for-instacart-c1b6bdf5ae13>

<https://github.com/singhvis29/Online-Grocery-Retail--Prediction-and-Recommendation>

## companies

Amazon, Walmart, D-mart

# PERSONALITY PREDICTION

## objective

To classify personalities of a given set of people or an individual

## industries

Hiring companies

## use case

Nowadays companies look for certain qualities in their employees and this system is helpful for hiring companies to hire candidates on basis of their personality, which eases the process instead of manual searching of such qualities

## algorithms

Logistic regression, OCEAN model

## solved solutions

<https://github.com/vidushi4/Personality-prediction-system>

<https://github.com/HiteshAgarwal1/Personality-Prediction-Through-CV>

## companies

McKinsey & Company, the CIA

# REAL-TIME HUMAN DETECTION

## objective

To count the number of persons in an image or video

## industries

Security Services, Aeronautics

## use case

It is used for counting the people coming in an event

It is also useful in counting participants in a protest

It is useful for avoiding overcrowding

In the time of COVID, there are certain rules about social distancing. It helps the store/shop to keep a track of these rules

It is useful in classes to keep in track total students strength

## algorithms

HOG, SVM

## solved solutions

<https://data-flair.training/blogs/python-project-real-time-human-detection-counting/>

<https://www.analyticsvidhya.com/blog/2019/02/building-crowd-counting-model-python/>

## companies

NASA, Tesla

# ROAD LANE LINE DETECTION

## objective

To detect lane lines in real-time

## industries

Automobile

## use case

Automobile companies are trying very hard to achieve level 5 autonomous driving where a car can self drive itself. In order to enable a car to self drive, it's extremely important that the car understands the road lanes. There are various traffic rules which are based on road-lanes which everyone follows. So a system which could detect these lanes would be great help or I should say it's must for a self driving car else there would be road accidents.

## algorithms

Hough transform, CNN, Computer Vision

## solved solutions

<https://data-flair.training/blogs/road-lane-line-detection/>

<https://www.analyticsvidhya.com/blog/2020/05/tutorial-real-time-lane-detection-opencv/>

<https://www.geeksforgeeks.org/opencv-real-time-road-lane-detection/>

## companies

Tesla

# CUSTOMER CHURN PREDICTION

## objective

To predict whether a customer has churned out or he/she is still associated with the company

## industries

FinTech, E-Commerce, Banking

## use case

The churned customers which are at the verge of churning can be retained by the company by giving attractive offers  
Special strategies are devised for the customers which have churned out to call them back

## algorithms

Classification Algorithms - Logistic regression, Decision Tree Classifier, Random Forest Classifier

## solved solutions

<https://thecleverprogrammer.com/2020/05/26/predict-customer-churn-with-python-and-machine-learning/>

<https://towardsdatascience.com/predict-customer-churn-in-python-e8cd6d3aaa7>

## companies

HDFC, Reliance, Alibaba, Spotify, Netflix

# HUMAN ACTIVITY RECOGNITION USING SMARTPHONE DATA

## objective

To classify sequences of data recorded by specialized harnesses or smart phones into known well-defined human activities.

## industries

Healthcare ,Security ,Entertainment.

## use case

It is used in various industries such as healthcare, security, entertainment where human motion recognition is important .

It is also used in anti crime securities, surveillance.

It is used to keep track of whether a person is moving or not or how much moving which is much required in this modern lifestyle to be away from diseases.

## algorithms

Classification Algorithms – KNN, XGBoost Classifier

## solved solutions

<https://the cleverprogrammer.com/2020/05/27/human-activity-recognition-using-smartphone-data-with-machine-learning/>

<https://github.com/anas337/Human-Activity-Recognition-Using-Smartphones.github.io>

## companies

Samsung, Apple, Google

# FACE LANDMARKS DETECTION

## objective

To detect some marks on face

## industries

Security, Social media

## use case

It is used by various security related companies in creating face codes  
It is used by various social media apps and particularly the face filters .The different landmarks in face like nose, ear, eyes are detected using this detector and the face filters are applied

## algorithms

CNN, RNN, OpenCV

## solved solutions

<https://thecleverprogrammer.com/2020/07/22/face-landmarks-detection/>

<https://towardsdatascience.com/face-landmark-detection-with-cnns-tensorflow-cf4d191d2f0>

## companies

Apple, Google , Instagram

# KEYWORDS RESEARCH

## objective

To find how often a keyword is entered into search engine over a given period

## industries

Social Media, Search Engine

## use case

It helps the researchers to know about frequency of a particular keyword  
It also help, bloggers to know about the burning topics to write a blog on that  
It also helps digital marketers and some more people in the digital industry to research on keywords

## algorithms

pytrends

## solved solutions

<https://the cleverprogrammer.com/2020/08/14/keyword-research-with-python/>

## companies

Google, Bing