



IOT Based Smart Ambulance

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ABSTRACT

a monitoring system for a exigency case transportation. The system will be useful for covering ambulance position using Google chart and Global Positioning System as the figures of road accidents in India are the loftiest across the world. To help this, Using advance wireless technology of GPS, it's possible to give medical installation to accident victim within short period of time. nonstop monitoring of ambulance position and status of case during the critical hour of patient transportation helps to ameliorate medical care. One of the issues during transportation of case is business related problems. It's thus necessary to have a presto, provident and effective business control. It can display position of ambulance and status of heart beat rate and temperature of case. After entering SMS sanitarium can prepare their staff for proper treatment of coming case. Proposed system track the way of ambulance coming and it makes all the signals green on the same track after seeing the ambulance. Proposed system also stores the case's former tradition information that will help to get better treatment. Case's data can be brought by using bio-metric device which will be available in ambulance vehicle.

Keywords: K-Means Clustering , Convolutional neural network (CNN), Support Vector Machine(SVM), Artificial Intelligence(AI)

Introduction

The main conception behind the proposed system is to give a smooth own for the ambulance to reach the hospitals in time and thereby minimizing the detention caused by business traffic. The ARDIUNO system is used to alter the business lights upon its appearance at business light junction which would save a lives at critical time. To avoid gratuitous business signal changes. In the current situation itself, transportation of a case to sanitarium in exigency conditions seems relatively simple but in factual it's veritably delicate during peak hours. also, the situation is gets worse when exigency vehicles have to stay for other vehicles to give way at corners with business signals. As the check aye 95if the ambulance can reach the sanitarium at current time without stuck into the business. In future it may get indeed worse. In this cause Recovery action need to be taken incontinently. So, for our over populated terrain, there's a real need for this paper for the society to make easier day to day transportations. This paper will help to reduce blockage of exigency vehicles in business and helps to give immediate recovery. Mobile app to authenticate exigency and non-emergency conditions of ambulance. GPS to track the nearest business signal post to the ambulance and to shoot the app data to that particular signal post. The main thing is participating of information between case and sanitarium. This information involves case's medical data, current condition and the most important thing position of ambulance. **Clustering** is one of the most common exploratory data analysis technique used to get an intuition about the structure of the data. It can be defined as the task of identifying subgroups in the data such that data points in the same subgroup (cluster) are very similar while data points in different clusters are very different. In other words, we try to find homogeneous subgroups within the data such that data points in each cluster are as similar as possible according to a similarity measure such as euclidean-based distance or correlation-based distance. The decision of which similarity measure to use is application-specific.

• Abbreviation and Acronyms:

- AI: Artificial intelligence
- SVM: Support Vector Machine
- CNN: Convolutional Neural Network
- K-Means Clustering

1. Artificial Intelligence:

Artificial intelligence is a field of wisdom concerned with structure computers and machines that can reason, learn, and act in such a way that would typically bear mortal intelligence or that involves data whose scale exceeds what humans can assay. AI is a broad field that encompasses numerous different disciplines, including computer wisdom, data analytics and statistics, tackle and software engineering, linguistics, neuroscience, and indeed gospel and psychology. AI is a broad field that encompasses numerous different disciplines, including computer wisdom, data analytics and statistics, tackle and software engineering, linguistics, neuroscience, and indeed gospel and psychology.

Types of artificial intelligence:

AI type-1: Based on Capabilities:

1 Weak AI or Narrow AI:

- Narrow AI is a type of AI which is suitable to perform a devoted task with intelligence. The most common and presently available AI is Narrow AI in the world of Artificial Intelligence. Narrow AI can not perform beyond its field or limitations, as it's only trained for one specific task. Hence it's also nominated as weak AI. Narrow AI can fail in changeable ways if it goes beyond its limits.

2 General AI:

General AI is a type of intelligence which could perform any intellectual task with effectiveness like a mortal. The idea behind the general AI to make such a system which could be smarter and suppose like a mortal by its own.

3 Super AI:

- Super AI is a position of Intelligence of Systems at which machines could surpass mortal intelligence, and can perform any task better than mortal with cognitive parcels.
- It's an outgrowth of general AI.

AI type-2: Based on functionality:-

1. Reactive Machines

- Purely reactive machines are the utmost introductory types of Artificial Intelligence.
- similar AI systems don't store recollections or once gestures for unborn conduct.

2. Limited Memory

- Limited memory machines can store once gestures or some data for a short period of time.
- These machines can use stored data for a limited time period only.

3. Theory of Mind

- Proposition of Mind AI should understand the mortal feelings, people, beliefs, and be suitable to interact socially like humans.
- This type of AI machines are still not developed, but experimenters are making lots of sweats and enhancement for developing similar AI machines.

4. Self-Awareness

- Tone- mindfulness AI is the future of Artificial Intelligence.
- These machines will be super intelligent, and will have their own knowledge, sentiments, and tone- mindfulness.
- These machines will be smarter than mortal mind.

2. SVM:

Support Vector Machine (SVM) is a form of supervised literacy fashion. It's used for both retrogression and bracket purposes still, utmost of the time it's used in bracket problems. Support Vector Machine is a fast and reliable bracket system that excels when given a small quantum of data. The main testament behind SVM is to produce a hyperplane and to classify the dataset given. To insulate the two classes of data points, there are multitudinous Conceivable Hyperplanes that could be picked. Our ideal is to find the aeroplane with the topmost periphery, i.e., the topmost separation between data points of the two classes. Expanding the periphery enables the unborn data points to be classified with much further precession. Hyperplanes are those that help in classifying the data. Data points or vectors that fall on either side of the hyperplane can be credited to different classes. If we've two independent features also our hyperplane will be three dimensional. If we've one independent point also we will have a simple one- dimensional hyperplane below is the figure from SVM. H1 and H2 are the lines drawn resemblant to hyperplane similar that the distance between these two i.e., the periphery is maximum. Above fig that shows how hyperplane is erected and can be used to classify the data points. An algorithm was utilised to give a variety of useful rules to find intrusions. They succeeded to record 99.60 as delicacy rate grounded on this methodology.

Advantages of SVM:

- Effective in high-dimensional spaces:** SVM performs well indeed when the number of confines is lesser than the number of samples. This is known as the "curse of dimensionality" problem, and SVM addresses it through the use of hyperplanes to separate classes.

- **Versatility in kernel selection:** SVM allows the use of different kernel functions, similar as direct, polynomial, radial base function (RBF), and sigmoid. This inflexibility enables SVM to handle colorful types of data distributions and prisoner complex connections.

2. Convolutional neural networks (CNN):

include some of the most common neural networks in ultramodern artificial intelligence. Most frequently used in image recognition, CNNs use several distinct layers(a convolutional subcaste, also a pooling subcaste) that filter different corridor of an image before putting it back together(in the completely connected subcaste). The before convolutional layers may look for simple features of an image similar as colours and edges, before looking for more complex features in fresh layers. It's a type of Deep Learning neural network armature generally used in Computer Vision. Computer vision is a field of Artificial Intelligence that enables a computer to understand and interpret the image or visual data. When it comes to Machine literacy, Artificial Neural Networks perform really well. Neural Networks are used in colourfull datasets like images, audio, and textbook.

In a regular Neural Network there are three types of layers:

- InputLayer:** It's the subcaste in which we give input to our model. The number of neurons in this subcaste is equal to the total number of features in our data(number of pixels in the case of an image).
- Hidden Layer:** The input from the Input subcaste is also feed into the retired subcaste. There can be numerous retired layers depending upon our model and data size. Each retired subcaste can have different figures of neurons which are generally lesser than the number of features. The affair from each subcaste is reckoned by matrix addition of affair of the former subcaste with learnable weights of that subcaste and also by the addition of learnable impulses followed by activation function which makes the network nonlinear.
- OutputLayer:**The affair from the retired caste is also fed into a logistic function like sigmoid or soft outside which converts the affair of each class into the probability score of each class.

Advantages of Convolutional Neural Networks(CNN):

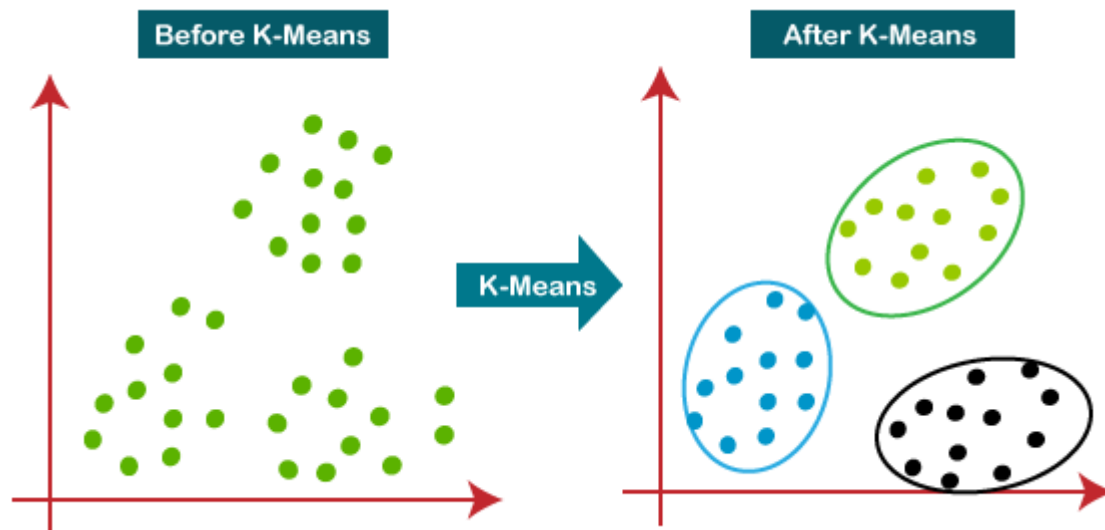
- Good at detecting patterns and features in images, vids, and audio signals.
- Robust to restatement, gyration, and spanning invariance.
- End- to- end training, no need for homemade point birth.
- Can handle large quantities of data and achieve high delicacy.

Disadvantages of Convolutional Neural Networks (CNN):

- Computationally precious to train and bear a lot of memory.
- Can be prone to overfitting if not enough data or proper regularization is used.
- Requires large quantities of labeled data.

3. K-Means Clustering :

• K- Means Clustering is a type of unsupervised literacy where the references need to be drawn from unlabelled datasets. Generally, it's used to capture meaningful structure, underpinning processes, and grouping essential in a dataset. In clustering, the task is to divide the population into several groups in such a way that the data points in the same groups are more analogous to each other than the data points in other groups. In short, it's a collection of objects grounded on their parallels and distinctness.



Advantages :

- fairly simple to apply.
- Scales to large data sets.
- Guarantees confluence.
- Can warm- start the positions of centroids.
- fluently adapts to new exemplifications.
- Generalizes to clusters of different shapes and sizes, similar as elliptical clusters.

Disadvantages:

- Choosing K manually.
- Being dependent on original values.
- Clustering data of varying sizes and viscosity.
- Clustering outliers.
- Scaling with number of confines.

Conclusion

This system will reduce accidents which frequently be at the business signal corners because other vehicles have to huddle to give way to the ambulance services. The proposed system is useful for critical patient information fluently find out. It provides transportation unit information and as well as patient health information, which is useful in farther exigency treatment for croaker. The Ambulance tracking system can help in saving numerous lives. It can also shoot current position using GPS system to the garçon database. The garçon in turn sends position and status information to the croaker.

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