

# “NERVE”

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## Abstract:

A Majority of People who have minor illness or chronic health issues are reluctant to raise concern related to their malady. Even so if they know the condition getting advanced they prefer to visit the nearest medical retail store and get quick cure. The pharmacist on the other hand having expertise in medical drugs has inability to specify disease based on inquires about the symptoms of the patient directly, and elicited any additional information by him or her . Our Nerve Software tries to eliminate and provide ore automated and easy approach to the problem by providing hands on services like Scanning the medical Prescription , voice assistance and medical services like Finding the nearest hospital,clinics and pharma stores.

**Keywords — Automated pharmacy system, Google Cloud Vision , Google Voice assistance, Prescription Scanning, Health services, Voice over, Nerve Software.**

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## I. INTRODUCTION

In General Healthcare System, we find three entities working up the chain deliver the benefits of improving malady of the patient. Doctor – who diagnoses the condition, Pharmacist –who has expertise in medical drugs, Patient – The victim of Illness in this scene.

As for part of Doctor and Pharmacist, They have to Bridge up the gap between Interpretation of health issues and the providing of correct medicine. But despite them being having expertise in their own field, there exist flaws that might sometimes lead to misinterpretation of the Medication or the misdiagnosis. The Misinterpretation of drug names is the prominent factor among others, and also Patients who show varied psychological aspect

towards this system , like ignoring the condition at earlier stages or reluctant to take the proper medication as prescribed by doctor.

There is exist a monopoly with relation to the doctor and the pharmacists with their mutual benefits of getting more profits from the medical sale with respect to the patient. As they try to sell the prescribed medicine of the higher rate or at the surplus prices the pharmacists gives the fix commission to the doctor as per their deal.

There may be a situation where the patient may not be physiologically prepared to go to the doctor or for some other reason such as waiting in the long queue, extra money taken by the doctors for preparing the case papers and also there is unavailability of hospitals in the rural areas. So rural people try to postpone to travel to go to the

doctor this leads to increasing severity of the medical condition.

Becoming a pharmacist requires years of training, this includes at least 2-3 years of undergraduate studies with an emphasis in the anatomy, biology and chemistry. The pharmacist needs to pass two preliminary licensing test to get the legal rights to open the store. In some cases people bribe to get the license. Different level of expertise depending on the type of qualification that they take might have an effect on the prescribing wrong medicine. Many pharmacist have lack of awareness relating the medical companies and their brands, so this may lead to tampering the health of the patient.

In some rural places, there is an unavailability of medicine or unavailability of medical stores. Until the required ordered medicine reaches the sick person, the health becomes more adverse. If there is an unavailability of medical stores, the person needs to travel long distance to get medicines. So the person neglects to travel and this leads to ill effect.

## II. LITERATURE REVIEW

An easy way to comply with the conference paper formatting requirements is to use this document as a template and simply type your text into it.// The review process was adopted by surveying the research papers related to existing pharmacy system Techniques. The 9 research paper articles were reviewed to cover the review of various techniques.

**ER. NEETU BHATIA[2014]** This manuscript considers a the approach to recognize Handwritten Characters Recognition by OCR Model where it is used transforming large amount of documents, either printed alphabet or handwritten into machine encoded text without any transformation, noise, resolution variations and other factors. This paper provides the classification into two types on-line and off-line character recognition. They use hardware that scan the pattern by translating the input given thru the electromagnetic or pressure

sensitive devices. The System Includes phases like Digitization,pre-processing ,segmentation and Feature Extraction.

**DR. PAUL RAJ, MURALI KRISHNA R, SOLLETI MANOJ KRISHNA, KOPPOLU HARSHA VARDHAN[2019]** This Paper Proposes the Idea of the Medical Chatbot which provides the diagnosis by using the machine learning models which help it to gain Knowledge about various diseases. The system tries to extract the input from the natural language and translating it into regular expression that match the vocabulary and hence make the search queries to g,ive the relevant results.

**GAJENDRA PRASAD K. C., SATVIK RANJAN, TATHAGAT ANKIT , VIVEK KUMAR[2019]** : The system tries to take different approach by Apriori Algorithm which optimizes the voice queries and training their own model with Recurrent Neural network which helps to gain accuracy every time it comes across different dataset .

**JITENDRA MAHATPURE, DR MAHESH MOTWANI, DR PIYUSH KUMAR SHUKLA [2019]:** This paper presents a healthcare system that helps storing and processing health records. The system generates an electronic prescription using speech recognition and natural language processing. A QR code on a patient's smartphone is used to retrieve the digital prescription record stored on a block chain network. Its keeps the historic information about the patient.

**N. ANJU LATHA, B. RAMA MURTHY , U. SUNITHA [2012]** : this paper explain about the Electronic health record which is used to store the patients data and maintain privacy, confidentiality and reduce medical errors.

**NIVEDITA BHIRUD, SUBHASH TATAALE, SAYALI RANDIVE, SHUBHAM NAHAR [2012]:** This System uses the combination of various database techniques to store the information automatically. In addition to the queries it also stores the images and the other meta data required

provide the details of the dosage and the other relevant details to dispense to the patient.

for further optimization of the queries and hence give better output.

**JOHN AMREIN, PAUL AMRIEN, MARTIN SMITH, PINE BLOSSOM HARVEY [2009]:** This makes use of electronic devices called PDA (Portable Digital Assistant) which can be used by the medical practitioner, and the doctors to ease the task related to prescribing medicines.

**ROSALY B. ALDAY, RUEL M. PAGAYON [2013]:** This is an application built on the same idea of scanning the medical description using the pre-trained machine learning model called Tesseract algorithm. It passes through different phases like Binarization, character separation, and character recognition.

From the above literature review, we find that the techniques are segregated as different software modules with not much accuracy. Our software will be overcoming the above challenges and also optimizing the existing algorithms of Scanning the Prescription. It will also provide a hands-on user-friendly interface like voice over assistance and Other Healthcare Services all integrated on a single platform. It will keep track of the medical profile of the patient and graphically display it in the form of demographic data.

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## 2.2 PROPOSED SYSTEM

Our system will first take the prescription from the patient in the form of the image. Through the camera, the image will then be processed by super-sampling into the grids. Each grid will be passed on to the neural network to find out the patterns and get the abstract details by using OCR model. This way we will be training our data set to optimize the recognition of human handwriting. The resulting data obtained will then be taken as keywords to search algorithmically in the databases for the match of the required medicines and as such will

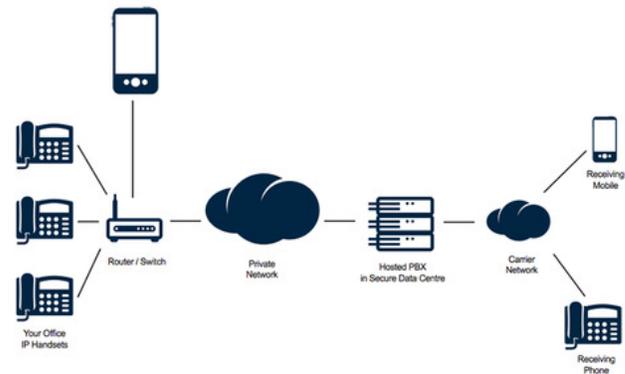


Fig 1. Voice Over Assistance

We are using the Google cloud vision API to integrate the vision detection features, image labeling and handwriting recognition with better accuracies. We also make use of their Voice over feature to search queries that are trained to handle the noise detection and elimination making it versatile to use it anywhere. The pre-trained models are more intelligent and get better as they learn more about the medical profile of the patient and the doctors can easily diagnose the report as our Data Record keeps track using a unique code for each user and syncs seamlessly across different platforms to display demographics and gain a better understanding of the data that is diagnosed.

We also provide the ease of access to these features by providing the details of the nearest clinics, hospitals, and medical retail stores so they can find help at remote locations.

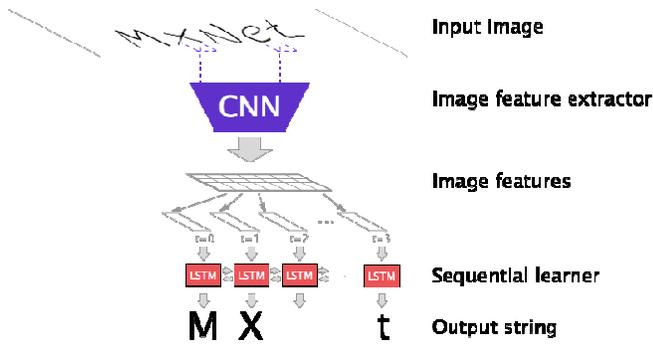


FIG. 1.2 OCR MODEL

Also providing the medical Assistance and giving the relevant details about the description, side effects, uses and concerns, warning, dosage, interactions, general instructions and other side effects.

### III. ALGORITHMS

#### 1. t-Distributed Stochastic Neighbor Embedding (t-SNE) :

It is a nonlinear dimensionality reduction technique well-suited for embedding high-dimensional data for visualization in a low-dimensional space of two or three dimensions. Specifically, it models each high-dimensional object by a two- or three-dimensional point in such a way that similar objects are modeled by nearby points and dissimilar objects are modeled by distant points with high probability.

The t-SNE algorithm comprises two main stages. First, t-SNE constructs a probability distribution over pairs of high-dimensional objects in such a way that similar objects have a high

probability of being picked while dissimilar points have an extremely small probability of being picked. Second, t-SNE defines a similar probability distribution over the points in the low-dimensional

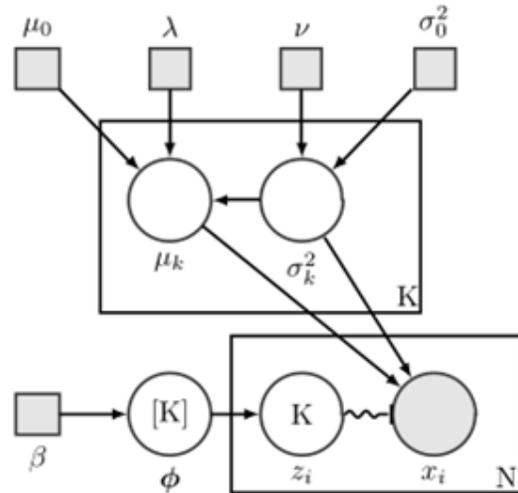


Fig. 1.3 t-SNE Algorithm

map, and it minimizes the Kullback-Leibler divergence between the two distributions with respect to the locations of the points in the map. Note that while the original algorithm uses the Euclidean distance between objects as the base of its similarity metric, this should be changed as appropriate.

#### 2. Gaussian Mixture Model :

Mathematically, a basic parametric mixture model can be described as follows:

A typical non-Bayesian Gaussian mixture model looks like this:

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$K$	=	number of mixture components
$N$	=	number of observations
$\theta_{i=1..K}$	=	parameter of distribution of observation associated with component $i$
$\phi_{i=1..K}$	=	mixture weight, i.e., prior probability of a particular component $i$
$\phi$	=	$K$ -dimensional vector composed of all the individual $\phi_{1..K}$ ; must sum to 1
$z_{i=1..N}$	=	component of observation $i$
$x_{i=1..N}$	=	observation $i$
$F(x \theta)$	=	probability distribution of an observation, parametrized on $\theta$
$z_{i=1..N}$	$\sim$	Categorical( $\phi$ )
$x_{i=1..N} z_{i=1..N}$	$\sim$	$F(\theta_{z_i})$

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Bayesian Gaussian mixture model using plate notation. Smaller squares indicate fixed parameters; larger circles indicate random variables. Filled-in shapes indicate known values. The indication [K] means a vector of size  $K$ .

#### IV. CONCLUSION :

Our Software “Nerve” is cross platform and can provide seamless integrity to help manage the Health of the Individual by making the application user friendly and automated features enriches the use , also the services which are of prime importance like ordering medicines and other health products.

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