

# [Abstract: the content of medicine. the curvelet](https://assignbuster.com/abstract-the-content-of-medicine-the-curvelet/)

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Abstract: Writing is the painting of the voice andhandwriting enables civilization. All ofus have different handwritings. It is difficult to recognize the different kindof handwritings, especially the doctor’s prescription. Often the same medicineis prescribed for different kinds of diseases.

The aim of this paper is topropose a system which use curvelet transform and artificial neural network forthe recognition of doctor’s prescription and convert it into a record. then retrievethe content  of the medicine. The inputis a scanned image of prescription and output is a bill with the prescriptionand the content of medicine. The Curvelet transform is to be used in thefeature extraction stage and artificial neural network is used for recognizingprescription. Curvelet transform makes it easier to extract curves in handwriting.

Back propagation algorithm is employed to train the system. So this systemhelps us to know whether the prescribed medicine is right. It also gives asolution to the difficulties in understanding a prescription. Keywords: OCR, ANN, Feature extraction                     Classification1. IntroductionEvery individual have different kind of handwriting. Some handwritings are beautiful and some are not. It is easy for human beingsto read and understand a handwritten document.

But a system cannot recognizethe different kind of handwriting. By using the OCR is able to provide thatability to the system. It is easy for human beings to read and understand ahandwritten document. By using the OCR is able to provide that ability to thesystem.

The conversion of hand written image or text in to document or recordis called optical character recognition (OCR). Handwriting recognition refersto understanding or determining the written word and converting it into aprinted format. This technology is using different fields including banking, postal, teaching etc.         OCRis classified into two types. They are handwritten character recognition andprinted character recognition. Hand written character is again divided in totwo on-line and of-line character recognition.

There are several advantage forOCR. It can reduce the data entry time. It can reduce the storage spacerequired by the time. The other advantage is fast retrieval of the data.       Thereare many recognition systems to recognize the English handwritten document. This paper focus on the recognition of a prescription it is very tough tounderstand the matter in it. The prescription will be written in cursivewriting. It also will have many curves in it.

So by using curvelet transform we can easily extract the features ofcharacter. Artificial neural network (ANN) is used for the classification. ANNis a computational model. The aim of ANN is to provide the human intelligenceto the machines.

After classifying the character the system aims to retrievethe content of the medicine. 2. Related worksThere exist many system for theclassifying handwritten characters. Most of the systems does not support thecursive letters. A handwritten recognition system must have 2 steps. They are featureextraction and classification.

The systems mainly make use of wavelet transformfor the feature extraction. Different algorithms from neural network is usedfor the classification. In some system support vector machine is used for theclassification. Many researchers have developedthe character recognition systems by using template matching, spatial features, Fourier and shape descriptors, Normalized chain code, Invariant moments, centralmoments, Zernike moments, modified invariantmoments, structural, statistical, Topological, Gabor, Zoningfeatures combinations of these feature etc. Different pattern classifiers likeneural networks, Hidden Markov models, and Fuzzy and SVM classifiers are used.

3. Proposed system In thispaper we propose a system to recognize the medical prescription and retrievethe content of the medicine. The system includes 5 modules. The first formodule is for the recognition of the prescription. The last module is toretrieve the content of the medicine. Modules for handwriting recognitioninclude preprocessing, segmentation, feature extraction, and classification.

Classification is done using artificial neural network. A neural network istrained with the 26 characters of English language. The features of thecharacter which is to be recognized is given as input to the system. The neuralnetwork compares the input features with the trained data set in it. Afterclassifying or recognizing the letter it returns the letter.

After classifyingthe entire medicine it is given as an input to medical database. Medicaldatabase returns t1e information on content of the medicine. The modulesimplemented in this paper is shown in the fig 1. The proposed systemarchitecture is shown in fig 2. Fig 1: Fig 2: 3. 1. Image AcquisitionCollection of sample data for training the neuralnetwork is involved in this module.

Data from different sources are collectedand stored in a file. The recognition system acquires a scanned image asan input image. The image should have a specific format such as JPEG, BMT etc. 3. 2.

PreprocessingThere will be many irregularities in the scannedprescription due to the sporadic handwriting. So the scanned image cannot givedirectly to the system as input. The irregularities affect the performance ofrecognition system badly.

So some operations should be performed on the imageto remove their irregularities and to make them in a normalized form. Preprocessing is done to remove this kind of irregularities in order to get abetter performance. Preprocessing include three functionalities. They are·       Noiseremoval·       Binarization·       ThinningFirstly the cropping of images were done manually. Then the size of all images is made as uniform. Then the noises form the imageis removed by using median filtering algorithm. Secondly the process ofbinarization is done which makes our image as a binary image. It is done byusing Otsu’sglobal thresholding method.

Now the image is reduced to level intensities whiteand black. After inverting the image the boundary box is created for everywords which touches the four sides of the word. At last thinning is done toresize the image. 3.

3. SegmentationImage segmentation is a process of separating theimage in the super pixels. Segmentation makes the image more meaningful. It iseasy to analyses a segmented image. The scanned prescription contain the namesof medicine. The name is separated in to a single character for furtherproceedings.

The individual character is obtained by the charactersegmentation. 3. 4.

Feature extractionFeature extraction is used to reduce the dimensionalityof the image. it is done to extract the unique features or property of everysingle character in the prescription. By extracting the unique features we candefine a letter with minimum amount of resources. The letter can be representedwith lesser number of bits. curvelet transform is used for the featureextraction because prescription contain many curves in it. More focus is madeon DiscreteCurvelet Transform with the Wrapping Technique. Algorithm for Feature ExtractionInput: image after segmentationOutput: features library1: segmented image of 64X64 pixels 2: image is reduced by using a discrete curvelet transform with a wrappingbased technique   3: find out the curvelet coefficient for every characters   4: compute the standard deviationof these coefficients in order to get a feature set of input5: obtain the features of everysingle character in the image and store it in a train library. 3.

5. ClassificationClassification refers to the recognition of thecharacter. it is done by using a multi-layer perceptron. Neural network is usedfor recognition. Before applying neural network it has to be trained withcharacter database. The input to the trained neural network is the features ofthe character that is to be recognized. Neural network is already trained with26 characters and its features.

it compares the input with this data and returnthe most matched pattern as the result. The neural network classify the inputinto one of the 26 characters. Algorithm for classificationInput: Isolated test character images. Output: recognition of prescription1. Obtain the features as per the algorithm.

2. Store these feature vectors in test library   database. 3. Compute the % of similarity between the features in the test library andtrain library. 4. Obtain the character with maximum % of similarity and print thatcharacter.

3. 6Obtaining the details of the medicineAfter recognizing the letter next step is toretrieve the content of medicine. For this a medical database is created. Therecognized medicine is given as input to the medical database. It compares withmedicine and the content of medicine to the user. 4ConclusionAn algorithm proposed here is used for therecognition of medical prescription . The system is expected to give a highperformance with the maximum accuracy.

Curvelet transform is used for thefeature extraction. It will be easier because the prescription contain manycurves in handwriting. ANN is used to provide the artificial intelligence tothe system. Back propagation algorithm is used to classify the prescription. atlast the text document of the prescription obtained as an output with thecontent of medicine in it. This system helps to solve dilemma in understandingthe prescription. 5.

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