Jyothi Engineering College
NAAC accredited college with NBA Accredited Programmes*
Approved by AICTE & affiliated to APJ Abdul kalam Technological University
A CENTRE OF EXCELLENCE IN SCIENCE & TECHNOLOGY BY THE CATHOLIC ARCHDIOCESE OF TRICHUR
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NBA accredited B. Tech Programmes in Computer Science & Engineering, Electronics & Communication Engineering, Electrical & Electronics Engineering and Mechanical Engineering valid for the academic years 2016 to 2022
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Online Autonomous Paper Evaluation

Department of CSE

Jyothi Engineering College

Thrissur

October 14, 2019

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CREATING TECHNOLOGY LEADERS OF TOMORROW
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GROUP-7

Group Members	Register No
Nova Dileep	JEC17CS078
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San Jose	JEC17CS089
Sreerag R Nandan	JEC17CS099

Vision of the Department

- Creating eminent and ethical leaders in the domain of Computational Sciences through quality professional education with a focus on holistic learning and excellence.

Mission of the Department

- To create technically competent and ethically conscious graduates in the field of Computer Science and Engineering by encouraging holistic learning and excellence.
- To prepare students for careers in Industry, Academia and the Government.
- To instill Entrepreneurial Orientation and research motivation among the students of the department.
- To emerge as a leader in education in the region by encouraging teaching, learning, industry and societal connect.

Introduction

1. We are proposing a Computerized Autonomous Paper Evaluation system which can be used in descriptive type examination for evaluation
2. This system overcomes many drawbacks of the existing system and helps to improve student's performance in a much better way

Existing System

Manual Paper Evaluation

Drawbacks

1. Biasness
2. Mistakes from the side of evaluator
3. Time consuming
4. Can dependent on appearance of paper
5. Transportation of papers are needed

Literature survey

Reference Papers:

1. **Extracting Text from Degraded Document Image**
   by Radhika Patel and Suman K. Mitra Dhirubhai Ambani Institute of Information and communication Technology Gandhinagar, India,2015
2. **A Robust Algorithm for Text Extraction from Images**
   by Najwa-Maria Chidiac, Pascal Damien, Charles Yaacoub Faculty of Engineering Holy Spirit University of Kaslik (USEK) Jounieh, Lebanon,2016
3. **Computerized Paper Evaluation Using Neural Network**
   by Tanupriya Choudhury, Kartikeya Jain, Lakshya Aggarwal, Ayushi Gupta, Garv Saxena,2017

Extracting Text from Degraded Document Image

Technology Used:

1. **Pre-processing**: The first step is converting the RGB (colour) image to grayscale
2. A PCA based conversion is used for this purpose
3. Next is a chain of basic image processing techniques to improve local contrast and suppressing these from background texture in order to efficiently detect text region motivated by where illumination variations is addressed

1. **Text area detection:** Identifies text area
2. **Post processing:** Takes care of false positives and negatives based on intensity values of pre-processed and grey image

Advantages:

1. Binarization in pre-processing provides almost zero loss of text area
2. Provides satisfactory result in text preservation of degraded images
3. Does not depend on text size and stroke width

Disadvantage:

1. Presence of undesired black and white blobs

Computerised paper evaluation using neural network

Technology used:

1. **Image processing**: Pre-processing of picture is performed using grayscale, obscure, edge and diminishing of the picture
2. **Training**: Training of the proposed framework is by using Self Organizing Maps ANN
3. **Detection**: System identified characters are matched with those in the database and ranking of the student is performed

Advantages:

1. No biasness
2. Not time consuming
3. Appearance of paper is not considered
4. Does not require transportation

Disadvantages:

1. Less adapted to noise
2. Low Accuracy

A robust algorithm for text extraction from images

Technology used:

1. **MSER :** Detects all text regions regardless of size and font and distinguish them from non-text regions
2. **Stroke width detector:** Enhanced MSER images are fed into this detector and different components are filtered according to set of geometric rules and OCR confidence

Advantages:

1. Effective on blurred and noisy images
2. 13% significant improvement compared to existing text extraction approach

Disadvantages:

1. Algorithm failed to detect text with shadowing effect
2. Failed to detect text with characters of small size and thin strokes

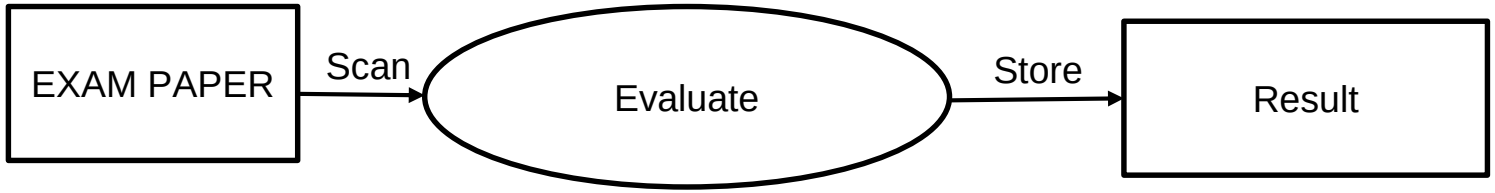
Inference

Reference Paper	Extracting Text from Degraded Document Image	A Robust Algorithm for Text Extraction from Images	Computerized Paper Evaluation Using Neural Network
Use Case	To extract text from old degraded low quality documents	To extract text from image in even in low lighting and moderate Noise condition	To evaluate paper using self organising map
Key Technology	PCA based conversion, Edge Detection Using Rough-Set Theory	Maximally Stable Extremal Regions (MSER) detection, Stroke Width Detector	Self Organizing Maps(SOM)

Proposed system

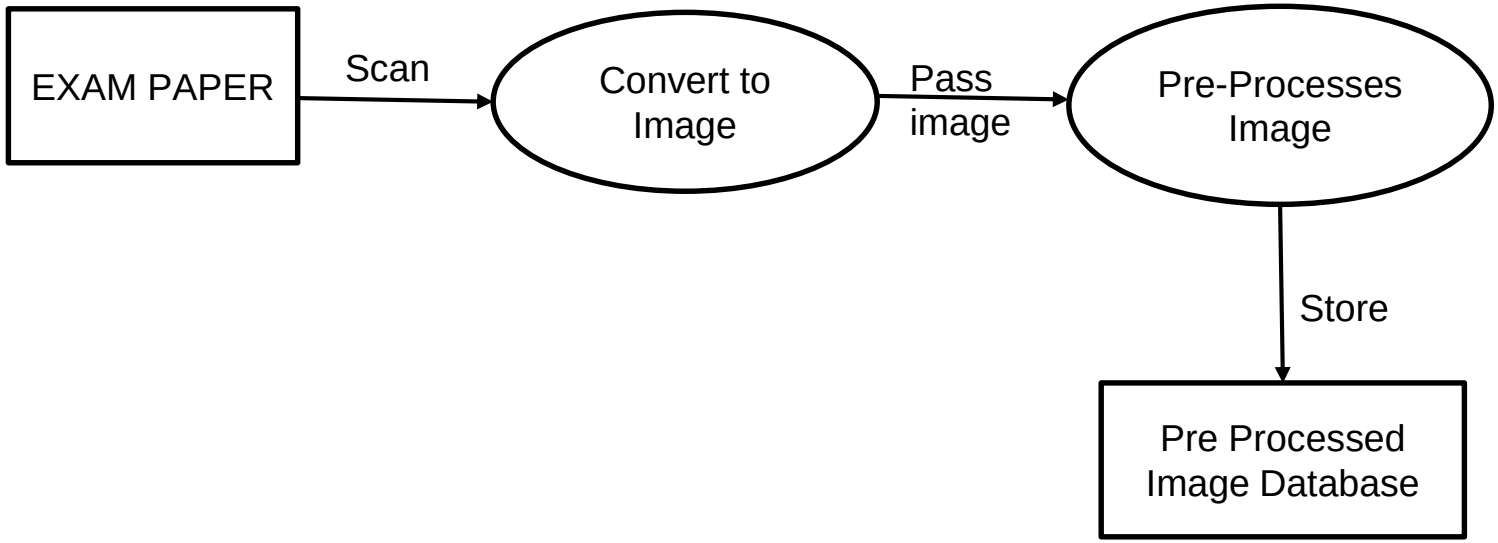
1. It is an online paper evaluation system that uses the technology of image processing
2. First the answer sheets are scanned into the computer
3. Compared with the predefined answer key
4. Marks are recorded accordingly
5. Page for suggestion/improvement is appended

0-LEVEL Data Flow Diagram



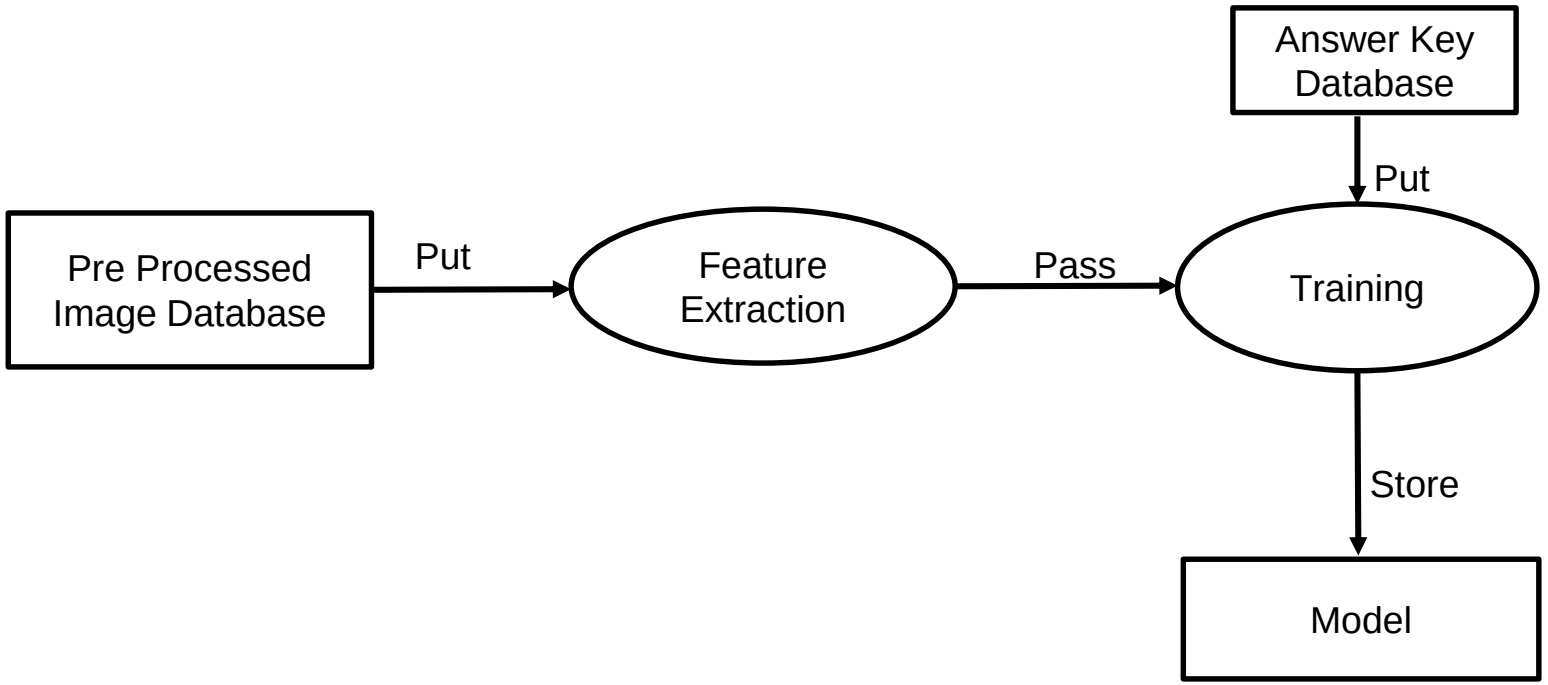
Data Flow Diagram 1

Data Pre-Processing



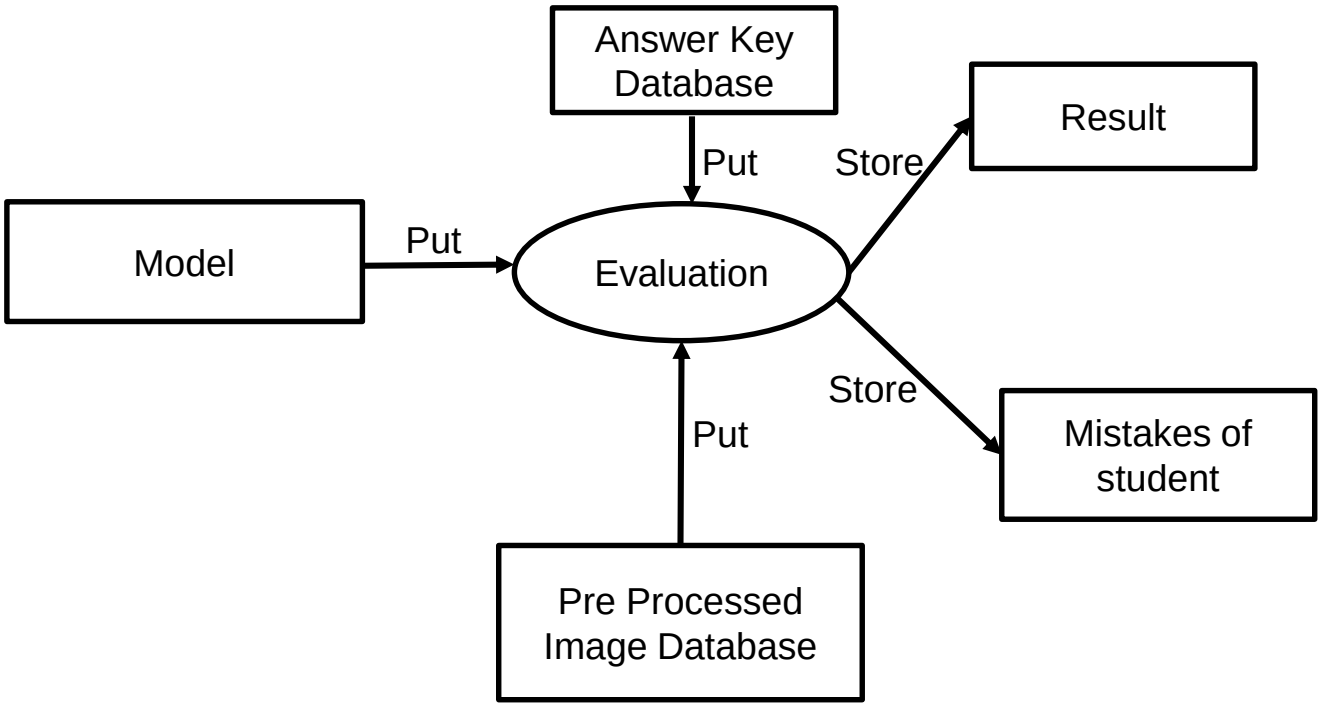
Data Flow Diagram 2

Training Machine Learning Model



Data Flow Diagram 3

Evaluation Using ML Model



Detailed design of the project

- First steps is to collect answer paper from student's or examination centre and convert it into digital Image
- Then we follow a series of steps such as Grayscailing, Blurring and Thinning to enhance the quality of the image

- Required features are then extracted from the Image to train machine learning model
- The model uses answer key and features of Image for training purposes
- After the creation of model new incoming images goes through pre processing and feature extracting step and then compared with the answer key through the model

- Similarity between answers in student's paper and answer key is analysed and mark is allotted accordingly
- Mistakes in the paper of students are noted and notified along the result

Application And Future Enhancement

1. Can be used in offices like village office for checking records of applicants
2. Can be used in hospitals for checking records of patients
3. Can be developed as android application for students to evaluate the paper their own
4. Can be developed as android application for Teachers to correct paper faster

Conclusion

1. This computerized autonomous paper evaluation system solves the problems of current evaluation system
2. Provides solution to manual mistakes
3. It is effective and feasibility
4. Can be used beyond educational field

References

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Thank You