

Department of Computer Science & Engineering Artificial Intelligence & Machine Learning

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FORM AUTOMATION SYSTEM

Computer Science & Engineering
Artificial Intelligence and Machine Learning

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Introduction

- In the realm of modern education and workforce management, accurate attendance tracking forms the cornerstone of efficiency and productivity.
- Embracing the revolutionary capabilities of Optical Character Recognition (OCR), our Attendance OCR project aims to revolutionize attendance management systems by automating the process of recording and managing attendance in educational institutions and workplaces.
- Through the fusion of cutting-edge AI and deep learning technologies, this transformative solution brings unparalleled accuracy, speed, and convenience to attendance tracking, eliminating the need for manual record-keeping and unlocking a new era of streamlined administrative processes.

Objectives

- To reduce and manage the data entry done by the staff.
- To make the responsibility of teachers lighter as they do not need to calculate the attendance percentage.
- To keep a maintained record of students actually present in the class by avoiding the proxy rates.
- To automate the manual system.
- To easily maintain higher priority task in institution.

Features

- **Precise Form Data Recording:** Our OCR-powered system offers unrivaled accuracy in recognizing and recording attendance data, virtually eliminating errors associated with traditional manual methods.
- **Automated Data Integration:** By integrating with existing form management platforms, our OCR solution automates data entry processes, reducing administrative burden and improving data integrity.
- **Customizable Reporting:** Generate comprehensive form reports with ease, providing valuable insights for educators, administrators, and HR personnel to make informed decisions.
- **Real-time Data Processing:** Harnessing the speed of OCR technology, our system enables real-time form data extraction, facilitating immediate availability of form records for stakeholders.



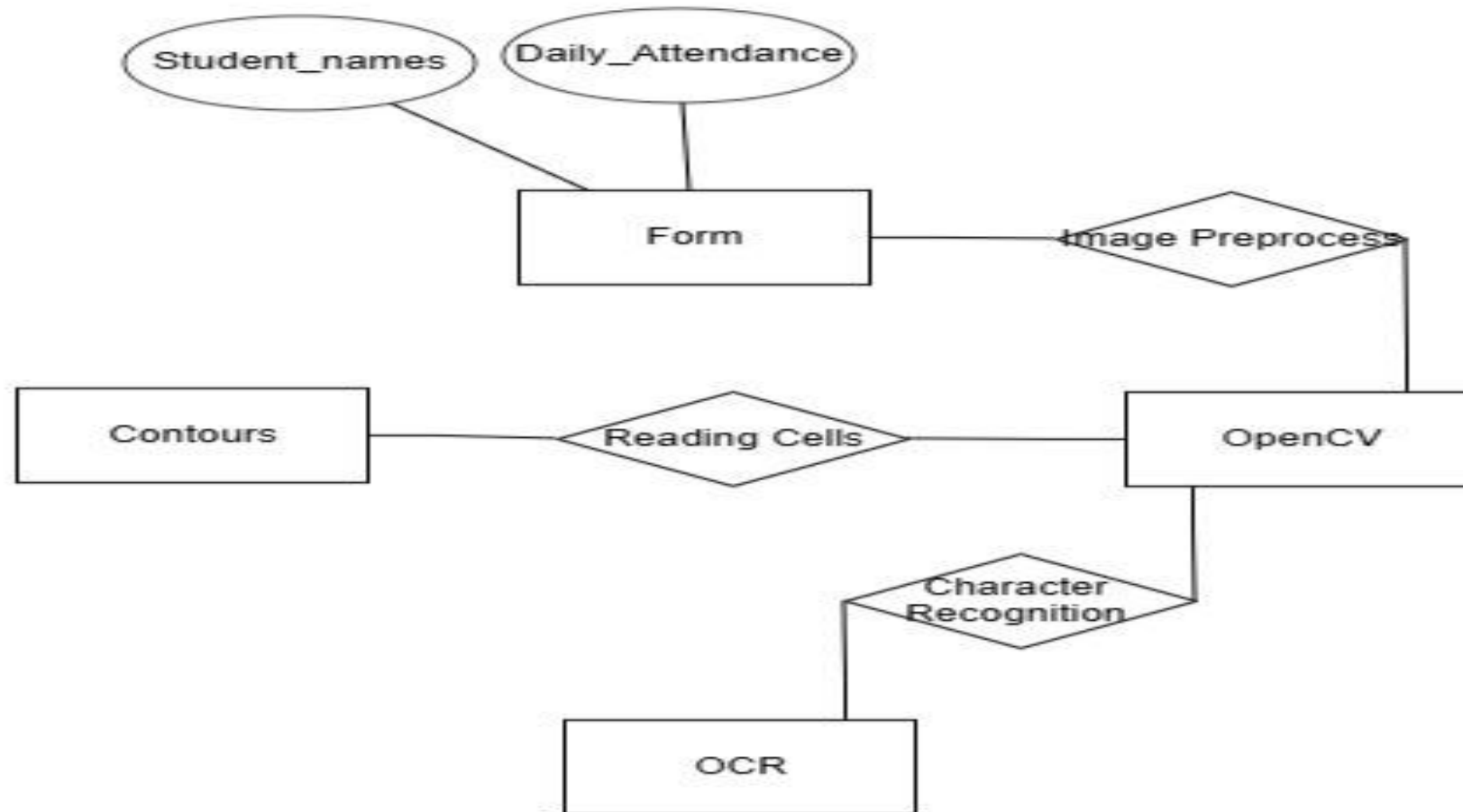
Literature Survey

Sr. No	Title	Author Name	Description
1.	IAS- Intelligent Attendance System based on Windows Image Acquisition(WIA) ,Optical Character Recognition(OCR) and Windows Communication Foundation(WCF) Service (May 2013)	Chirag Patel, Maitri Chokshi, Dr. Atul Patel	<ul style="list-style-type: none"> Taking students attendance in the class and then posting it in the online attendance system is a quite time consuming process for the teachers. In this paper, we have presented a normal approach for posting the attendance in the online attendance system without human intervention[1].
2.	Vision Tracking and Optical Character Recognition for Augmented Reality based Attendance System (April 2020)	D P Kaur, A Mantri	<ul style="list-style-type: none"> This paper presents a system for smart portable electronic device which is based on computer vision-based techniques for scanning the manually entered data by the user for automatic update on a central database and augmented reality is used for automatic display of updated data to the user. The developed application is in the form of an Android app which is installed in compatible smart portable electronic device[2].

Sr. No	Title	Author Name	Description
3.	OCR in Indian Scripts: A Survey (Nov 2015)	Peeta Basa Pati, A G Ramakrishnan	<ul style="list-style-type: none"> A significantly large number of scripts are used to represent these languages. A desire of vision researchers is to develop an integrated Optical Character Recognition (OCR) system which will be able to process all such scripts. Such a development, if objectified, will not only enable faster flow of information across the country, but also have a profound impact on its scientific and economic development[3].
4.	CONVERSION OF IMAGE TO EXCEL USING OCR TECHNIQUE (July 2022)	Amitha S, Mithun M, PC Chandana, Mayurjit Borkakoty, Adithya U	<ul style="list-style-type: none"> This paper proposes regarding the image processing of the text conversion and we use images in literacy education. In this research work, a web application is developed to convert the Attendance register image to excel conversion. It translates text just by capturing an image and uploading the image with system and conversion instantly appears on user's system screen and can view the extracted text[4].

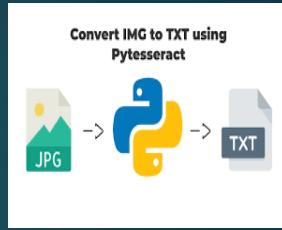
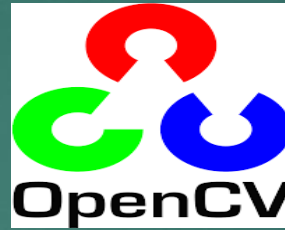
Sr. No	Title	Author Name	Description
5.	Automated Mobile Attendance System (AMAS) (March 2020)	Aditi Dankar, Poornima Panduranga Kundapur	<ul style="list-style-type: none"> One of the most common academic processes that institutions/universities follow is that of maintaining student/staff attendance. However, it has been observed that the conventional method of taking students attendance on registers to confirm their physical presence is still prevalent. In order to address the attendance issue, this paper proposes a simple user-friendly mobile application “Automated Mobile Attendance System” (AMAS). AMAS is interfaced with a website in the backend for data entry and report generation[5].

BLOCK DIAGRAM



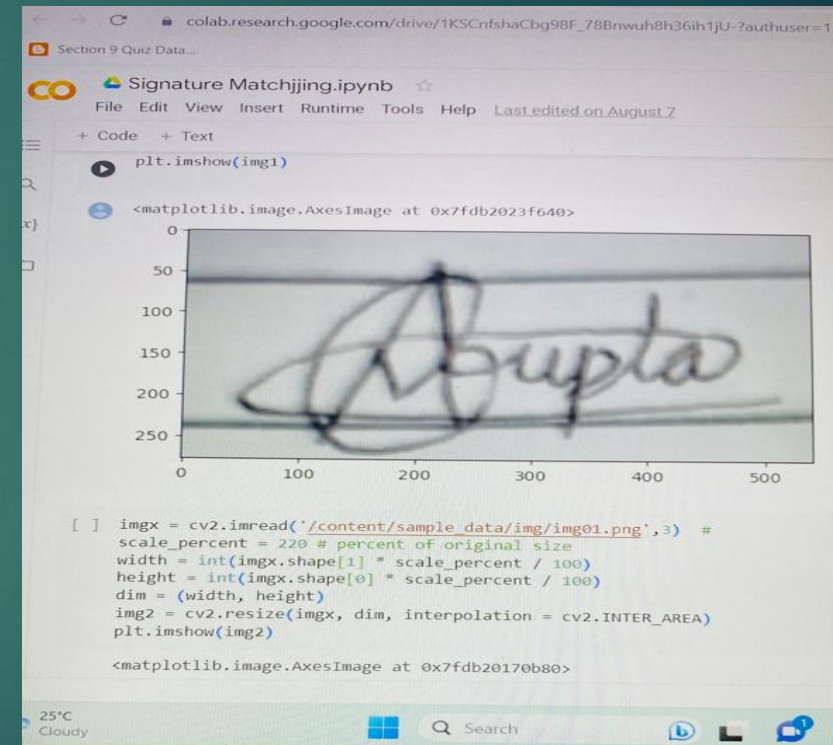
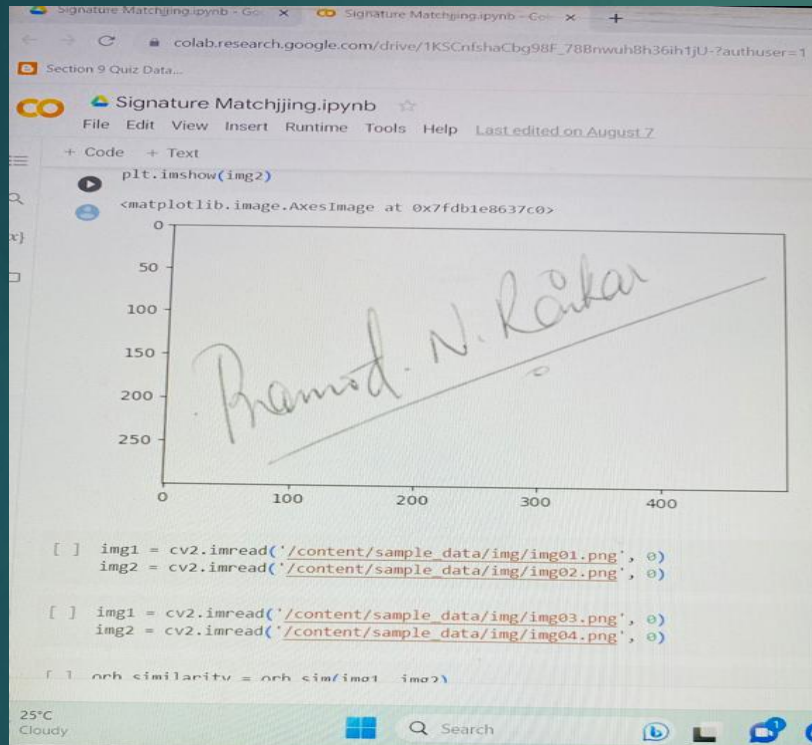
Tools/software, Languages used

- OpenCV
- PIL (Python Imaging Library)
- Tesseract OCR
- pytesseract
- TensorFlow or PyTorch
- Scikit-learn
- Flask or Django
- HTML, CSS, JavaScript
- Django



PROJECT WORK


Implementation

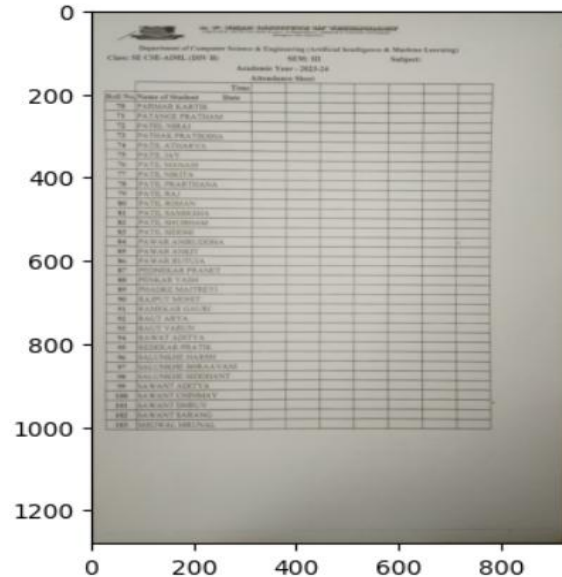


Implementation

Import CSV

```
img = Image.open('/content/sample_data/Images/test3.jpg')  
plt.imshow(img)
```

 <matplotlib.image.AxesImage at 0x7ea50c2f4880>



PATHAK PRATIKSHA
PATIL ATHARVA
PATIL JAY
PATIL MANASI
PATIL NIKITA
PATIL PRARTHANA
PATIL RAJ
PATIL ROHAN
PATIL SAMIKSHA
PATIL SHUBHAM
PATIL SIDDHI
PAWAR ANIRUDDHA
PAWAR ANKIT
PAWAR RUTUJA
PEDNEKAR PRANET
PENKAR YASH
PHADKE MAITREYI
RAJPUT MOHIT
RAMEKAR GAURI
RAUT ARYA
RAUT VARUN
RAWAT ADITYA

```
[ ] text = pytesseract.image_to_string(roi)  
print(text)
```

Implementation



data_to_insert



```
['Name',  
'RAWAT ADITYA',  
'RAUT VARUN',  
'RAUT ARYA',  
'RAMEKAR GAURI',  
'RAJPUT MOHIT',  
'PHADKE MAITREY!',  
'PENKAR YASH',  
'PEDNEKAR PRANET',  
'PAWAR RUTUJA.',  
'PAWAR ANKIT',  
'PAWAR ANIRUDDHA',  
'PATIL SIDDHI',  
'PATIL SHUBHAM',  
'PATIL SAMIKSHA',  
'PATIL ROHAN',  
'PATIL RAJ',  
'PATIL PRARTHANA',  
'PATIL NIKITA',  
'PATIL MANASI',  
'PATIL JAY',  
'PATIL ATHARVA',  
'PATHAK PRATIKSHA']
```



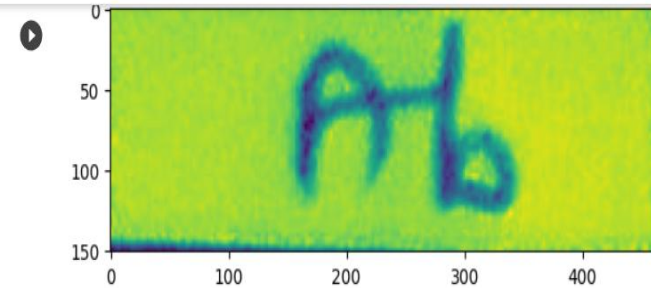
Enter The Language to be converted into : Hindi

नाम
रावत आदित्य
राउत वरुण
राउत आर्य
रमेकर गौरी
राजपूत मोहित
Phadke Maitrey!
पेनकर यश
पेडनेकर प्रानेत
पवार रुतुजा।
पवार अंकित
पवार अनिरुद्ध
पाटिल सिद्धि
पाटिल शुभम
पाटिल समिक्षा
पाटिल रोहन
पाटिल राज
पाटिल प्रर्थना
पाटिल निकिता
पाटिल मनसी
पाटिल जे
पाटिल अथर्व
पाठक प्रतिपक्ष

Implementation

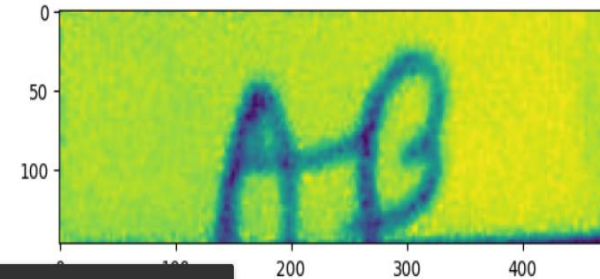
Enter The Language to be converted into : Marathi

नाव
रावत आदित्य
राउत वरुण
रत आर्य
रमेकर गौरी
राजपूत मोहित
फडके मैत्रे!
पेनकर यश
पेडनेकर प्रनेत
पवार रुतुजा.
पवार अंकित
पवार अनिरुद्ध
पाटील सिद्धि
पाटील शुभम
पाटील समिक्षा
पाटील रोहन
पाटील राज
पाटील प्रार्थना
पाटील निकिता
पाटील मनसी
पाटील जय
पाटील अथर्व
पाठक प्रतिका



```
imgx = cv2.imread('/content/sample_data/data/test2.jpg', 0)
scale_percent = 220 # percent of original size
width = int(imgx.shape[1] * scale_percent / 100)
height = int(imgx.shape[0] * scale_percent / 100)
dim = (width, height)
img2 = cv2.resize(imgx, dim, interpolation = cv2.INTER_AREA)
plt.imshow(img2)
```

<matplotlib.image.AxesImage at 0x7ea50a3af100>



Conclusion

- The main conclusion of the OCR Attendance System is to keep present/absent details of employees or students by avoiding proxy system.
- The benefit of implementing such a system is that the efficiency and accuracy of the data entered is easy to maintain.
- This system saves valuable time and the resources by converting the data entered into excel sheet which makes it easy for calculating attendance percentage.

References

Journal Papers :

- [1] Chirag Patel, Maitri Chokshi, Dr. Atul Patel, “IAS- Intelligent Attendance System based on Windows Image Acquisition(WIA) ,Optical Character Recognition(OCR) and Windows Communication Foundation(WCF) Service”, International Journal of Scientific & Engineering Research, ISSN 2229-5518, Volume 4, Issue 5, May-2013.
- [2] D P Kaur, A Mantri, “Vision Tracking and Optical Character Recognition for Augmented Reality based Attendance System”, IOP Conference Series: Materials Science and Engineering, Volume 993, International Conference on Mechanical, Electronics and Computer Engineering, April 2020.
- [3] Peeta Basa Pati, A G Ramakrishnan, “OCR in Indian Scripts : A Survey”, IETE Technical Review, Volume 22, 2005 - Issue 3, November-2015.
- [4] Amitha S, Mithun M, PC Chandana, Mayurjit Borkakoty, Adithya U, “CONVERSION OF IMAGE TO EXCEL USING OCR TECHNIQUE”, International Research Journal of Modernization in Engineering Technology and Science, e-ISSN: 2582-5208, Volume:04, Issue:07, July 2022.
- [5] Aditi Dankar, Poornima Panduranga Kundapur, “Automated Mobile Attendance System (AMAS)”, International Conference on Advances in Computing, Communication and Control (ICAC3), IEEE Xplore, March 2020.

Useful Links :

- [6] <https://youtu.be/dMaNiabqVdo?si=n-b62uOvtpxoxz6F>
- [7] https://youtu.be/PY_N1XdFp4w?si=mSHsvR5sbb16Ck9V
- [8] <https://youtu.be/rHux0gMZ3Eg?si=L6mwAZiJi7wRnwc3>



THANK YOU