

Document Scanning using Mobile Camera

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ABSTRACT

Initially, printers and scanners were employed to convert paper documents to soft documents. The cameras on mobile phones are increasingly being utilized to scan and produce PDF documents. This tool will convert hard copies of a desired document to soft digital pdf format. Additionally, the scanned document can be translated to smaller sizes and formats if necessary. When scanning papers for digital files, chances are you'll want to store them in the portable document-PDF file format. This Application will be a scanner-specific interface. Traditional scan-based document analysis techniques provide a decent indication and a starting point, but they cannot be applied directly to camera pictures. Other compression program produces hazy, distorted images. This will compress it such that there is less quality loss and greater compression.

Keywords: Scanner, File Reducer, Merger, OCR, Editor

1. INTRODUCTION

In today's society, we have camera-enabled cell phones that may be utilized for a number of reasons. It may be more convenient to use a camera as a document scanner than the traditional way of preserving volumes and pages. This document scanner is capable of scanning a wide range of materials, including books. The most important benefit of a document scanner program is that it can scan and compress a document to reduce the size of the pdf and its storage needs. It also has an image compression capability that compresses images as efficiently as possible while maintaining picture quality. It also has a speech-to-pdf tool and an OCR scanner. A user may simply scan text from a document and transform it into editable format using OCR. In terms of document security, the document can be password-protected and safely stored in your cloud storage.

2. OBJECTIVE

1. **Minimize paper storage:** App minimizes the use of a paper and cuts the money cost which is required for the hard copies.
2. **Increased security:** The information in the application is secured using passwords and encryption algorithms and it can be only accessed through user credentials.
3. **Reduced costs:** As we are minimizing the use of the paper and storage it will reduce the cost, we are spending on the third parties and paper which will eventually reduce the cost.
4. **Environmentally friendly:** We are using soft copies instead of hard copies which reduces the cutting of the trees used for paper making which will protect the environment.
5. **Convenience:** Holding soft copies is much easier than carrying hard copies of the books, pages, etc. We can carry multiple soft copies which make it convenient for users.
6. **No Manual Searching:** Locating stored hard copies requires manual searching. Someone must access the file area and then invest their valuable time digging through the mess. With digitally indexed documents, you can easily find the document you need through a text-based search.

3. LITERATURE REVIEW

Various publications in the literature have explored camera-based scanning of paper documents, which are primarily driven by panorama reconstruction and picture mosaicing techniques from the computer vision research field. In the first image, a feature-based method is utilized to predict camera motion and help the user in capturing photographs of document patches. The predicted camera motion is used with a key point feature descriptor-based approach to register

acquired picture patches and rebuild a document mosaic. A 2D scanning method for a planar scene is provided. The video frame topology is deduced on a 2D manifold by aligning successive and overlapping video frames. A multi-resolution approach is used to blend the aligned frames. A multi-resolution approach for producing a seamless mosaic is used to join the aligned frames.

Hashing, an image retrieval technique, is utilized for key point recognition and feature description in frames in local probable arrangement. Matching LLAH feature descriptors align images, and feature correspondences are employed to combine input frames for mosaic reconstruction. The collected frames are corrected in the first step by reducing perspective distortion using texture flow information. For determining translation and scaling across video frames, a Hough transform-based voting mechanism is utilized. A sharpness-based seamless assembly of overlapping pictures is used to rebuild the mosaic. Panoramas on mobile phones have been created using inertial sensors included in phones. In the first stage, inertial sensor data is used to compute the location and relative displacement of video frames. Using inertial sensor data alignment estimate, a more exact alignment of the video frames is computed using a key point feature descriptor-based approach, and the mosaic picture is produced using feature correspondences.

4. WORKING

Pdf Conversion: Android system selects an image from the gallery or camera using activity result launcher and converts them into the list of URI's and then further into the bitmap than can be shown in the grid format and can be further processed. This item can be dragged out or deleted when needed. Bitmaps are one by one attached to an empty pdf document object with definite resolution and quality and then finally exported to the android external storage system using java file management or using android content resolver according the android version.

Batch Scanning: It allows the android camera to take multiple pictures at a time and show it in the list format to convert it into the pdf format. It takes permission from android system of camera and process the image in same way in all android systems.

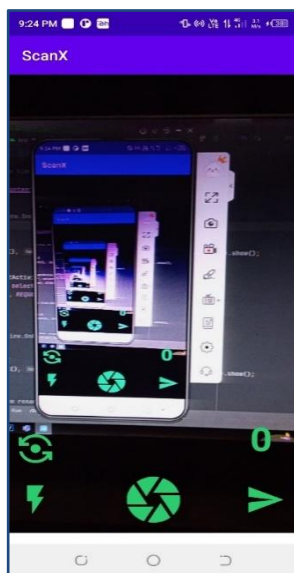


Figure 1

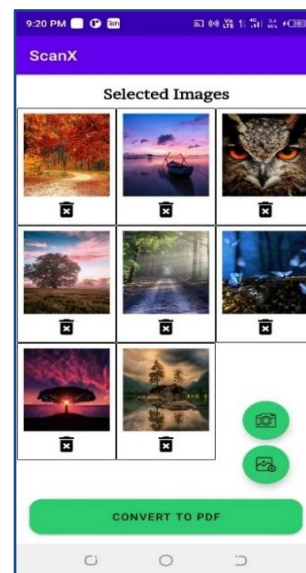


Figure 2

Quality Reduction: Image quality is reduced using default bitmap features that comes with android framework. Firstly, Bitmap is converted into the byte input array then accordingly and algorithm finds the right quality for the size of the image which is selected and saves it in the android external storage system.

Image Editing: It implements image editing options like cropping, rotation, scaling, brightness, saturation, contrast control using library functions available in u crop and edit.

Optical Character Recognition: It works using firebase machine learning kit by google. It scans the image and using machine learning model it detects the text from image and make the text available us to copy and then convert it to the pdf format.

Speech Detection: Speech to pdf conversion works using speech recognizer given by android framework. It detects the voice in the certain language and when it stops listening it results back the data in the format of text which can be further converted into the pdf format.



Figure 3

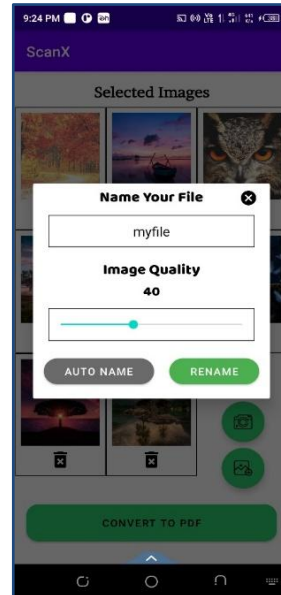


Figure 4

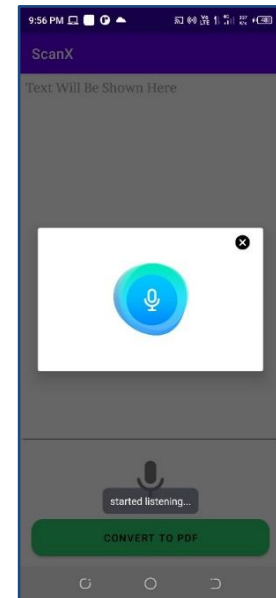


Figure 5

5. MODULES DESCRIPTION

Image to pdf converter:

Image to pdf converter is a core module of this application which converts the image bitmap into a pdf file using pdf document in android. It scans the images in batch from the camera and also scans images from smartphones gallery and arrange in the order which the images are selected. It gives ability to drag and drop the images to their desired position in a recycler view in android system.

Bitmap: Bitmap (BMP) is an image file format that can be used to create and store computer graphics. A bitmap file displays a small dot in a pattern that, when viewed from afar, creates an overall image. A bitmap image is a grid made of rows and columns where a specific cell is given a value that fills it in or leaves it blank, thus creating an image out of the data.

This module has following features:

Camera Scanner: It scans the images from the camera and shows the output of the scanned images in the application. It has front and rear camera options and have scanned image count feature.

Gallery Picker: This pick multiple images from gallery and convert them into the list of bitmaps and shown in the android view.

Image Rearranging and Deleting: This feature gives us ability to arrange images using drag and drop option as per page number of the pdf file that will be final output of the application also it deletes the image from the list by clicking the delete icon on the image.

Quality Control: While converting images into pdf we have an option to select the image quality of every image from 1% to 100% where 100% is the highest quality and 1% is the minimum quality.

Naming Options: We can rename the pdf file using two ways. One is using auto rename option which names the file according to the time in milliseconds and also have manual renaming options.

Pdf Viewer: This application has an inbuilt pdf viewer which has features like horizontal and vertical scroll, pinch and zoom, page number etc.

Image Tools: This module has various features for image processing options. Features are as follows:

Image Size Compression: It converts the image into a desired size in kilobytes. It converts a bitmap into the byte array and compress the byte array using default android image compression algorithms and saves it in android external storage in desired directory.

Image format changer: It changes the image from one format into another format. It converts JPEG to JPG, JPEG to PNG and other format conversions using android default bitmap compression algorithms.

Resolution Changer: It changes the aspects ratio of the image by changing the actual width and height of the image

Image Editor: Image editor has basic editing features as follows:

Image Cropping: It crops the desired image from all directions using zoom option and saves the changes accordingly in the application and into the external storage of the device.

Scaling Image: It scales the image from one dimension to another. It works like an image cropping feature.

Rotating Image: This feature rotates the image bitmap into the desired degree of rotation provided. It has default 90-degree rotation change feature which will be used to rotate image by 90 degrees.

Image Brightness, Contrast and Saturation: It increase the white tone of the image bitmap which eventually increase the brightness of the whole image accordingly. This feature increases or decreases the contrast, saturation and sharpness of the image according to the user need and saves it into android external storage.

OCR (optical character recognition): It scans the image from camera and recognizes the text from images using Goggles firebase machine learning kit in android.

Optical character recognition, Optical character reader or OCR is the process of reading printed or handwritten text and converting them into machine-encoded text. OCR is mainly used in the field of artificial intelligence, pattern recognition, and computer vision.

CONCLUSION

The use of the Document scanner has come across a long way. The main purpose of the Scan-X is for Scanning the paper document and store them in digital format. This is because handling the paper document can be very hard to handle as they are fragile and can be easily be destroyed due to Natural Occurrence, but the digital document can be stored on cloud and can encrypted by password. The Document Scanner have evolved from many generations, it has come along from just being able to create pdf files to sharing them on cloud and merging them etc. The Document Scanner may be used by a large number of people to scan papers. This application may be used for a variety of tasks, including document scanning and file reduction. When it comes to the main purpose of the document scanner application, it aids in the reduction of paper costs and usage, and it may be extremely useful in office and college work, among other things. Since we are in the twenty-first century, everyone has a smartphone with a camera, this application is incredibly simple to use and supports all Android devices. When it comes to filling out any online form, a document scanner is really useful.

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