

User Guide for Linux-Intelligent-OCR-Solution



Version 2.0

What is Lios

Lios is a free and open source software for converting print in to text using either scanner or a camera, It can also produce text out of scanned images from other sources such as Pdf, Image, Folder containing Images or screenshot. Program is given total accessibility for visually impaired. Lios is written in python3, and we release it under GPL-3 license. There are great many possibilities for this program, Feedback is the key to it.

See : [Home Page](#), [Forum](#), [Video Tutorials](#), [Source Code](#)

Features of Lios

1. Import images from Scanner, PDFs, Folder, or Webcam,
2. Take and Recognize Screenshot,
3. Recognize Selected Areas(Rectangle selection),
4. Support two OCR Engines (Cuneiform,Tesseract),
5. Tesseract Trainer GUI - Train your Tesseract to improve accuracy
6. Full Auto Rotation for any Language(If aspell installed for the language, Eg : "sudo apt-get install aspell-hi" for Hindi,
7. Side by side view of image and output
8. Advanced Scanner Brightness optimizer,
9. Text Reader for low vision with Highlighting, With user selected Color, Font, and Background Color,
10. Audio converter(espeak),
11. Spell-checker(aspell),
12. Export as pdf (text/images),
13. Dictionary Support for English(Artha)
14. Options for save, load and reset settings,
15. Other options - Find, Find-and-Replace, Go-To-Page, Go-To-Line, Append file, Punch File, Selection of starting page number, page numbering mode and number of pages to scan, Selection of Scan area, brightness, resolution and time between repeated scanning, Output Insert position, image rotation and zoom options, etc

Opening and Closing

For opening Lios launch Application menu > Graphics > Lios. Or one can search in dash board and start Lios from there.

Open with image items or PDF

One can select required images to be imported from the file browser and open the context menu using right click or application key and select open with Lios

Closing

Select Quit from File menu or press Ctrl+Q

Importing images from various sources

Importing image

At first choose the *import-image* from the *file* menu of Lios. This will cause a file chooser dialogue to appear. One can select a particular image or multiple images files. The images will appear on image list of Lios.

Importing images from PDF

At first select *import-PDF* item from *file* menu. A file chooser dialogue will appear, here you can select the PDF file to be extracted.

Importing all images in a folder

At first choose the *import-folder* from the *file* menu of Lios. This will cause a file chooser dialogue to appear. One can select the folder containing images files. The images will appear on image list of Lios.

Importing image from scanner

Before scanning make sure that scan menu is available and select the scanner from the Lios main interface if multiple scanners are connected. You should press *Update-Scanner-List* when a scanner is connected or removed.

The pages and their brightness may be different. So it is important to select apt resolution, brightness and scan area while scanning book. One can change these settings from *scanning page* of *Lios preferences*. Increasing or decreasing resolution can be done by clicking on '+' - 'button or pressing up and down arrow from the resolution spin button. (Default 300)

increasing or decreasing brightness can also be done in the same way. However It's better to use the brightness optimizer to set the exact brightness value for a particular book. (Default 50)

The scan area can be selected using the scan-area combobox. It can be quarter, half or three quarter. (Default - Full)

One can make scan using *scan-image(F8)* button from the scan menu

Import image from scanner repeatedly

One can set the number of pages to be scanned repeatedly from *scanning page* of *preferences* also the time between the two scanning can be changed. One can start scanning repeatedly using *scan-repeatedly(Ctrl+F8)* item from scan menu. If you want to stop repeated scanning using *stop-all-process(Ctrl+F4)* item in the scan menu.

Take Screenshot

One can take screenshot and recognize that using this features. There are two modes the first one is capture entire screen and the second one is capture by selecting an area. Both of this options are placed in scan menu. The second option is more preferred. This feature can be used for recognizing text from videos.

Capture image using Webcam

One can start capturing by selecting **Scan-Using-Webcam** from scan menu. Then adjust the webcam and click on **take** button to capture the image. After capturing enough images close the window and select image from icon view on left side of lios and process it.

Manipulation of imported Images

Image manipulation options are available in Image Menu of Lios.

Invert List

This is used to change the order of images

Reposition of image items

one can click and drag image to any position among other images in the list.

Rotate selected Images

One can rotate bunch of images that are not in exact rotation.

Delete selected Images

One can delete all images or selected images from the list.

Save Images

Used to save all images or selected images to a folder.

Save images as PDF

One can save all images as pdf or save selected images as pdf.

OCR images without rotating

Before running ocr on images we can set OCR engine, language and insert position.

These options are in recognition page of Lios preferences. The selection of engine will affect the supported languages combobox. One can decide the place in which 'output text' is added. It can be at the starting position end position or wherever the cursor blinks.

After setting this, one can ocr images without rotation using ocr-selected-images-without-rotating item from the ocr menu. Or selecting the images from the image list and using the same option from the properties menu(Right click)

OCR images with rotation

The mode rotation can be selected from the recognition page of Lios preferences. The options available are Full automatic, Partial automatic and Manual.

Full automatic – The Lios will automatically select the apt rotation. The detection may take several seconds. Partial automatic- In partial automatic mode first scanned orientation is the model for the rest. Manual – In this you can give any orientation you like for each and every image, The rotation should be set in the recognition page of Lios preferences.

OCR Rectangle selections

One can select the region of interest from an image by drawing rectangles in the image using mouse. After selecting the regions one can OCR the items using **Recognize-Selected-Areas** Button shown *left side of image view*. For each entry in the list there will be starting X,Y, width and height. The overlap won't be allowed.

Scan and OCR directly

One can do scan and ocr directly using **scan-and-ocr(F9)** button from scan menu. This will first make a scan and add image to the list then ocr the image with respect to the rotation policy.

Scan-and-ocr-repeatedly(Ctrl+F9) will scan and recognize images repeatedly. The process can be stopped using **stop-all-process(Ctrl+F4)** button.

Manipulation of OCR Output

New

One can start a new book or clear the entire text by selecting new(Ctrl+N) from the File menu. This will ask confirmation if text is not saved.

Open

To open a file in Lios, select the Open(Ctrl+O) button in File menu. This will cause the Open dialog to appear. Use your mouse or keyboard to select the file that you wish to open, and then click Open. The file that you've selected will open.

Save/Save As

To save a file in Lios, select the Save(Ctrl+S) button from the file menu. If you are saving a new file, the Save As dialog will appear, and you can select a name for the file, as well as the directory where you would like the file to be saved.

Other Basic Options

This includes all text manipulation tools like cut, copy, paste, and delete text.

Punch

This is used to open text on a file and paste that text in the current cursor position. This will cause the open dialog to appear, and there you can select the file to be punched.

Append

Same as punch but the text will be added at the end of the current text.

Find

This can be used for finding out the word in text. Finding the word in Lios can be done via Opening the find tool by Choosing **Find(Ctrl+F)** item from Edit menu. Enter the text that you wish to search into the Find word field. To find the next match, click Next. To find the previous match, click Previous. One can see the context for current match above the Previous and Next buttons. Also the matched word will be highlighted.

Find and Replace

Editing text can be time consuming. To save time, Lios includes a Replace function that helps you to find and replace portions of text. In order to replace select **Find-and-Replace(Ctrl+R)** from **Edit** menu. Enter the text that you wish to replace into the word field. Enter the new replacement text into the Replace word field. To find the next match, click **Next**. To find the previous match, click **Previous**. One can see the context for current match below the Previous and Next buttons. To

replace only the current match, click **Replace**. To replace all occurrences of the searched-for text, click **Replace All**.

Spell checker

One can manually check the spelling of a text selection or the entire document.

To check the spelling of a text, the appropriate dictionaries must be installed. The spell check starts at the current cursor position, or at the beginning of the text selection. Click in the document, or select the text that you want to check. Choose **Spell-Check(Ctrl+F7)** from the Tools menu. When a possible spelling error is encountered, the Spell check dialog opens and Lios offers some suggested corrections. Do one of the following:

To accept a correction, click the suggestion, and then click **change**. Edit the sentence in the upper text box, and then click **change**. Or to add the unknown word to a user-defined dictionary, click **Add to user dict**.

Readability

Font and Color : - General page includes options for changing Font, Color and Background colour and same options for highlighting. This can increase the readability of text.

Go-to-line

Select Go-to-line(Ctrl+L) from Edit menu. The go-to-line dialogue box will appear with current line number. Now type the line number and press Enter.

Go-to-page

Select Go-to-Page(Ctrl+L) from Edit menu. The Go-to-Page dialogue box will appear, type the page number and press Enter.

Text Reader

One can Read the output text using TTS via setting the cursor and activating the **Start-Reader(F5)** item from tools menu. One can change the speed, rate, voice and reading volume from general page of Lios preferences. One can increase or decrease the speech rate while reading using **Increase-Reader-Speed (Ctrl+PageUp)** and **Decrease-Reader-Speed (Ctrl+PageDown)** buttons on the same menu.

Utilities

Brightness Optimizer

One can find the apt brightness for a book using the brightness optimizer brightness checker is one of the major utilities of Lios. different books demands different brightness level depending on the quality of the paper. ocr process results best on the brightness level set. It can be done using the brightness spin button in the recognition page in the Lios preferences. If one is not familiar with determining the brightness of a book, can use the brightness optimizer in the scan menu. To start optimizer select **Optimize-Scanner-Brightness** from scan menu. Then Lios will ask you to set the following parameters.

Note that if mode of rotation in preferences is Full-Automatic or Partial-Automatic then lios will try to detect the rotation using a single scan and pop-up **Optimize Scanner-Brightness** dialog.

In optimize dialog the first one is **angle-to-be-rotated** of rotation for optimizing, The second one **Current-Value** that is existing brightness(default value is 50), The third parameter is **Start**, it means,

the value from which the brightness check starts(default start is 10). the forth one is distance, that is, difference between brightness level set for each consecutive scanning(default distance is 10). The forth parameter is **End**, it means, the value from which the brightness check Ends (default end is 90). If one does not change any value and click the **optimize** button.

The program will scan from 10 to 90 with a gap of 10. After each scanning, the total number of words detected will be announced. After ten scanning, one can opt for further accuracy in brightness changing the values or just click **Optimize** button to follow the changed default values. In the end click the **apply** button and ocr process will be done on the brightness level set. It is highly recommended that at the beginning of a new Book, this utility may be used. Also note that a typical page that represents the quality of the book may be selected and no movement of the page kept in the scanner may be made till the process is over.

Audio converter

One can use audio converter to change the text into small pieces of audio and save it as WAV Files. You can decide the speed, pitch, split time (to decide length of each WAV files) and volume before conversion.

Artha

One can findout the meaning of any word using artha. Select the word and Press Alt+Ctrl+W to get the meaning, synonyms, antonyms, derivatives, word related to them, and words similar to them.

Saving and Loading Preferences

Lios Preferences dialogue box contains three pages, General, Recognition and Scanning. One can save and load preferences for each book. Also one can reset the preferences using **Restore** item in Preferences menu.

Scanner Trouble Shooting

These options can be changed from scanning page of Lios Preferences.

Changing the driver

The next item for selecting driver. If one driver is not working one can select the other one.

Change to Lineart or binary

Lineart and binary are two modes which allow user to scan directly as black and white image. This is more appropriate for recognition. One can disable this but color scanning will take more time than lineart.

Cache Calibration

By enabling Cache Calibration one can avoid heating scanner lamp each time.

Training Tesseract OCR Engine

Step 1 : Prepare the image files to be trained. Each image should contain 10 point sized letters with the same selected font. Do not mix letters with different font in one image.

Step 2 : Launch Tesseract-Trainer from graphics menu

Step 3 : If you installed tesseract data in any of the following directory(default) then just continue by clicking "No". If not you have to press "Yes" to search for your tessdata directory

```
/usr/share/tesseract-ocr/tessdata,  
/usr/share/tesseract/tessdata,  
/usr/share/tessdata,  
/usr/local/share/tesseract-ocr/tessdata,  
/usr/local/share/tesseract/tessdata,  
/usr/local/share/tessdata
```

Step 4 : Change the language to most similar to your newly training language

Step 5 : Add images to be trained by clicking "Add Image-Box Pairs" button. If the box files are not present with the same image name, it will ask for auto-annotate, and by clicking "Yes" button you can annotate each letters with its existing knowledge.

Step 6 : Select each images and correct its boxes. You can use zoom option if required. Delete unwanted boxes using "Delete" button or "Alt+d" keyboard shortcut. You can take backup of box file by using "Export-Boxes" button.

Step 7 : Correct the font entry's for each images

Step 8 : Train Tesseract. Change the language to English and Press "Train Image-Box pairs. Give name for the new Traineddata. If asked for permission give password in order to copy it to your tesseract data directory.

Step 9 : In order to test new Traineddata, change the language combo-box to new language, select the trained image to test, and click "OCR & View Output".

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