Tesseract OCR Text from images

CONCEPTS

The call is tesseract <input> <outputbase> [options] [formats]. The output base gets its extension added; use stdout to print instead.

Image 300 dpi, clean, upright
↓ segment (--psm)
Layout blocks, lines, words
↓ recognize (--oem, -l)
Text words + confidence
↓ write (config names)
Output txt, pdf, hocr, tsv

Options such as -l and --psm go before the output format names. Image quality (about 300 dpi, high contrast, straight) matters more than any flag.

BASICS

tesseract *<img>* *<out>*
OCR an image into <out>.txt

tesseract *<img>* **stdout**
Print recognized text

tesseract stdin stdout
Read image from a pipe, print text

tesseract *<list.txt>* *<out>*
OCR images listed one per line

tesseract --version
Show version

tesseract --help
Show usage

tesseract --help-psm
List page segmentation modes

tesseract --help-oem
List engine modes

tesseract --help-extra
Show advanced help

LANGUAGES

tesseract --list-langs
List installed languages

tesseract *<img>* *<out>* **-l** *<lang>*
Recognize one language

tesseract *<img>* *<out>* **-l** *<lang>*+*<lang>*
Combine several languages

LANGUAGES (cont.)

tesseract --tessdata-dir *<dir>* **--list-langs**
List languages in another folder

TESSDATA_PREFIX=*<dir>*
tesseract *<img>* *<out>*
Point to the tessdata parent

A language needs its <lang>.traineddata file in the tessdata folder. Distros ship extras as separate packages.

LAYOUT (--PSM)

tesseract *<img>* *<out>* **--psm 3**
Fully automatic layout (default)

tesseract *<img>* *<out>* **--psm 6**
One uniform block of text

tesseract *<img>* *<out>* **--psm 7**
One single text line

tesseract *<img>* *<out>* **--psm 8**
One single word

tesseract *<img>* *<out>* **--psm 10**
One single character

tesseract *<img>* *<out>* **--psm 4**
One column of variable sizes

tesseract *<img>* *<out>* **--psm 11**
Sparse text, any order

tesseract *<img>* *<out>* **--psm 0**
Detect orientation and script only

Wrong results on a tiny crop or a form field? Try 7, 8 or 6 before anything else. Use 11 for scattered labels.

ENGINE & TUNING

tesseract *<img>* *<out>* **--oem 1**
Use the LSTM neural engine

tesseract *<img>* *<out>* **--dpi** *<n>*
Set input resolution

tesseract *<img>* *<out>* **-c** *<name>*=*<value>*
Set a parameter

-c tessedit_char_whitelist=0123456789
Digits only

ENGINE & TUNING (cont.)

-c preserve_interword_spaces=1
Keep column spacing

tesseract *<img>* *<out>* **--user-words** *<file>*
Add a word list

OUTPUT FORMATS

tesseract *<img>* *<out>* **txt**
Plain text, <out>.txt (default)

tesseract *<img>* *<out>* **pdf**
Searchable PDF with text layer

tesseract *<img>* *<out>* **hocr**
hOCR HTML with word boxes

tesseract *<img>* *<out>* **tsv**
Tab-separated words, boxes, conf

tesseract *<img>* *<out>* **makebox**
Character box file

tesseract *<img>* *<out>* **txt pdf hocr**
Write several formats at once

tesseract *<img>* *<out>* **quiet**
Suppress warnings and messages

tsv columns: level, page_num, block_num, par_num, line_num, word_num, left, top, width, height, conf, text. Filter low conf to find shaky words.

PREPARING IMAGES

magick *<in>* **-colorspace Gray** *<out>*.**png**
Convert to grayscale

magick *<in>* **-resize 200%** *<out>*.**png**
Enlarge small text

magick *<in>* **-density 300** *<out>*.**png**
Set 300 dpi metadata

magick *<in>* **-threshold 50%** *<out>*.**png**
Binarize to black and white

magick *<in>* **-deskew 40%** *<out>*.**png**
Straighten a slightly tilted scan

pdftoppm -r 300 -png *<in>*.**pdf** *<prefix>*
Rasterize a PDF to pages