Open source libraries:

High level:

<https://github.com/penny4860/SVHN-deep-digit-detector>

Low level:

<https://pypi.org/project/pytesseract/>

<https://opencv.org/>

OpenCV tutorial:

<https://opencv-python-tutroals.readthedocs.io/en/latest/py_tutorials/py_imgproc/py_morphological_ops/py_morphological_ops.html>

<https://www.pyimagesearch.com/2017/02/13/recognizing-digits-with-opencv-and-python/><https://spieswl.github.io/projects/2017/magic-eraser-computer-vision>

<https://hackernoon.com/building-a-gas-pump-scanner-with-opencv-python-ios-116fe6c9ae8b>

Image augmentation with scikit-image: <https://medium.com/@thimblot/data-augmentation-boost-your-image-dataset-with-few-lines-of-python-155c2dc1baec>

APIs:

<https://cloud.google.com/vision/docs/ocr>

What is digital Digits

<https://en.wikipedia.org/wiki/Seven-segment_display>

MSER:

<https://www.toptal.com/machine-learning/real-time-object-detection-using-mser-in-ios>

Others implementations:

<https://towardsdatascience.com/build-a-multi-digit-detector-with-keras-and-opencv-b97e3cd3b37>

<https://www.kaggle.com/c/digit-recognizer>

Other source dataset:

The street view house number dataset

<http://ufldl.stanford.edu/housenumbers/>

“Reading gas meter with computer vision” (including labelled digit data)

<https://github.com/ParalelniPolis/ppplyn>

“GasPumpOCR”

<https://github.com/kazmiekr/GasPumpOCR>

Google search:

“Line edge and contours detection”

[http://robindavid.fr/opencv-tutorial/chapter5-line-edge-and-contours-detection.html](http://www.robindavid.fr/opencv-tutorial/chapter5-line-edge-and-contours-detection.html)

<https://www.google.com/search?q=digital+digit&source=lnms&tbm=isch&sa=X&ved=0ahUKEwi22O-D_dnkAhXwxoUKHZxvASgQ_AUIEigB&biw=1440&bih=821>

<https://en.wikipedia.org/wiki/Seven-segment_display>

<https://static.googleusercontent.com/media/research.google.com/en//pubs/archive/33418.pdf>

End-to-End:

Four digit SVHN sequence prediction with CNN using Keras with TensorFlow backend <https://github.com/beeps82/SVHN_CNN>

<http://petr-marek.com/blog/2017/07/31/sequence-digits-recognition-localization/>

<https://www.youtube.com/watch?v=ZDRt21VEOpA>

Multi-label classification

<https://medium.com/@vijayabhaskar96/multi-label-image-classification-tutorial-with-keras-imagedatagenerator-cd541f8eaf24>

IoU:

<http://ronny.rest/tutorials/module/localization_001/iou/#targetText=Intersect%20over%20Union%20(IoU)%20is,area%20of%20the%20two%20boxes.>

<https://answers.opencv.org/question/67091/how-to-find-if-2-rectangles-are-overlapping-each-other/?answer=67092>

<https://stackoverflow.com/questions/30507141/is-there-any-function-in-opencv-to-find-the-intersection-union-and-complements>

Fit\_generator:

<https://towardsdatascience.com/writing-custom-keras-generators-fe815d992c5a>

<https://stanford.edu/~shervine/blog/keras-how-to-generate-data-on-the-fly>

<https://www.pyimagesearch.com/2018/12/24/how-to-use-keras-fit-and-fit_generator-a-hands-on-tutorial/>

<https://github.com/keras-team/keras/issues/8130>