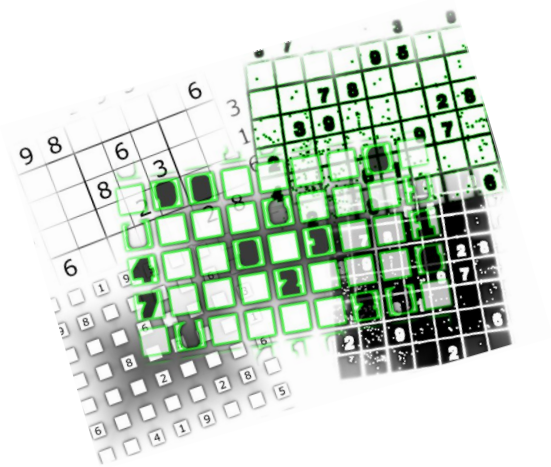

Sudoku and Optical Character Recognition in Python

IDA Østjylland Seminar, 23/10/2023

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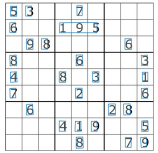


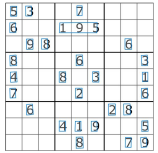
OCR for Sudoku

- Google Goggles (discontinued in 2018) solved Sudoku in 2011: https://www.youtube.com/watch?v=tgIhm6spFFs

- Sudoku Solver Realtime Camera → App Store https://youtube.com/shorts/dS9LC4NT_SM?feature=shared

- Sudoku by Panagola → Play Store (Android) https://youtube.com/shorts/ZOJC1ovpPIM?feature=shared
  Can solve the board, but it is meant for the user to play

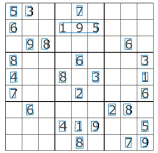
- Many nice github repositories (no packaging)



OCR for Sudoku

Popular approach for scanning of a sudoku puzzle in the wild:

- Preprocessing: grayscaling, thresholding/binarization, dilation and other morphology operation to accentuate main grid lines
- Finding the largest (e.g. area wise) rectangular contour as the main grid/box (using findContours algorithm) and extracting the corner of the main box/outer grid
- Correcting for perspective
- Creating an artificial grid based on the identified rectangular contour
- Feeding each isolated cell to the OCR trained model



OCR for Sudoku

Activity !

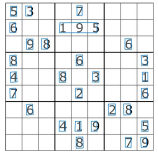
- Running Jupyter notebook with S1 and S2 images:
.\ocr\main-pipeline-1-lokalavisenfavrskov.ipynb

- Use the output matrix as input for the solver

- Run with your sudoku images ! For both successes and failures you can send an email with image + extracted matrix to:

  luminita.totu+sudoku@gmail.com

- Try to maybe adjust and improve the pipeline for your image(s) !



OCR for Sudoku

Some conclusions:

- Approach is fine for prototyping, but it is not robust to a large variation of images
- Can be made more robust by maybe some automatic gate/checking and parameter swipes, by user interface (like in the Android app)
- …