

- 3.2 (a) 01001 0011 00  
(b) 0101  
(c) 0111  
(d) 010

## Digital Image Processing

30/12/2022

- (1) A windowed-Total-variation regularization constraint model for blind image restoration (Feb 2022)

- they are estimating accurate blur kernel
- they are saying but type of blur is fixed that is motion blur
- proposed method can extract useful edges for accurate blur kernel estimation

\*\*\* - code/github repo is not given. & pure mathematics based

selected  
for the  
task  
without  
deep learning

- (2) Adaptively Sparse Regularization for Blind Image Restoration

(2022)

- Due to blur and noise effect caused by imaging, transmission, and other processes, the image quality is degraded.
- For that blind image restoration is used. Main goal is to estimate accurate blur kernel and latent sharp image.

- proposed method: Adaptively Sparse Regularization

\*\*\* - purely mathematics based algorithm

\*\*\* - code/github repo is not given

- proper algo is given.

(3) Fractional order Total variation image blind restoration based on self similarity features. (18 Feb, 2020)

- Self-similarity is a popular texture features and well-defined in the statistics.
- measuring image quality based on structural similarity index and peak-signal-to-noise ratio.
- they have used c++ rather than MATLAB. OR sometimes they have used c++ or MATLAB parallel.

\*\*\* {

- code is not given / github repo is not given.
- purely mathematics based no deep learning involved.

- proper algorithm is not given

*selected  
exactly 4  
similar to  
whatever we  
want.*  
Joint blur kernel and CNN for blind image restoration  
(8 May, 2019)

- they have proposed an approach with a joint blur kernel estimation and CNN method for blind image restoration.
- the blur kernel estimation is based on both blur support parameter estimation and blur type identification.
- automatic feature line detection algorithm: blur support parameter estimation
- dictionary learning algorithm: blur type identification
- they have used CNN for non-blind deconvolution

*important*

{- Term: Deep image prior is a type of CNN used to enhance a given image with no prior training data.

- results when we compared proposed joint method with other blind image restoration methods, proposed method can obtain restored images under three types of unknown blur kernels.
- they are proposed method is better than conventional blind image restoration algorithms in terms of restoration quality and computation time.
- this paper can be divided into two folds:
  - (i) blur kernel estimation
  - (ii) non-blind deconvolution
    - ↳ (1) blind support parameter estimation
    - ↳ (2) blur type identification
- important
  - MATLAB (R2014b) PC computer with 3.3 GHz Intel Xeon CPU and NVIDIA Quadro K620 GPU.
- Algorithms are purely mathematics based.

## (5) Blind Image Restoration without prior knowledge (8 March, 2020)

Now we have ~~three~~ four ways to continue this project:

→ (1) similar way as presented in paper 4.

→ (2) similar way as presented in paper 5.

← (3) direct training of neural network using dataset ~~on b~~

(4) deep image prior

explored approach.

out our  
approached which  
we have thought