|  |  |
| --- | --- |
|  a) Original  |  b) Proposed algorithm  |
|   |   |
| c)  **[Fitschen et~al.(2017)Fitschen, Ma Schuff]**  |  d) Avizo Curtaining Wizard |
|   |   |

Table 1: A comparison of the Canny edge detection applied to the images in figure 2, generated using the scikit-image 0.12.3 in Anaconda Python. Scikit-image's method for calculating the OTSU grayscale threshold,  was used by setting  and , respectively, as the low and high Canny thresholds. a) is the original image, b) is the output of the algorithm proposed in this paper, c) is the output of the algorithm created by  **[Fitschen et~al.(2017)Fitschen, Ma Schuff]** and d) is the output of Avizo's curtaining removal wizard. Undesirable vertical lines which are the result of curtains have been eliminated almost entirely in b) and c), with some leftover and even new ones created in d). As edge detection is a usual precursor to segmentation, this is a good metric for assessing the usefulness of each curtaining correction algorithm.

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| --- | --- |
|  a) Original  |  b) Proposed algorithm  |
|   |   |
| c)  **[Fitschen et~al.(2017)Fitschen, Ma Schuff]**  |  d) Avizo Curtaining Wizard |
|   |   |

Table 2: A comparison of curtaining correction algorithms. a) is the original image of a pore in our concrete dataset, b) is the result of our proposed method (block size = 20px, overlap = 2px, N = 8, ), c) is the image processed by  **[Fitschen et~al.(2017)Fitschen, Ma Schuff]**'s vertical curtaining algorithm, d) is the result of Avizo's FFT Curtaining Filter run once for each angle (97 & 89 -- measured from the positive x-axis), using the default 3 tolerance setting.

|  |  |
| --- | --- |
|  a. Original  |  b.   |
|   |   |
| c.   |  d.   |
|   |   |
| e.   |  f. L-Curve  |
|   |   |

Table 3: a) through e) show the effect of a range of  values. Higher values penalize changes to the image more heavily, resulting in an image which retains more of the original detail, but with the side effect of correcting curtaining artefacts less effectively. The value of  can therefore be tailored to the application. f) Is an LCurve plotting the sum of the absolute values of x-direction differences (-difference) versus the mean-energy () difference between the original and corrected image. This plot suggests that  provides an optimal balance between curtain correction and changes to the image (block size = 20 px, overlap = 2px, )

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   |  Original  |  Proposed  | **[Fitschen et~al.(2017)Fitschen, Ma Schuff]**  |  Avizo  |
| a)  |   |   |   |   |
| b)  |   |   |   |   |
| c)  |   |   |   |   |

Table 4: A comparison of blown up sections shown in figure 2 a).

**References**

[Fitschen et~al.(2017)Fitschen, Ma Schuff] Fitschen, J.H., Ma, J. & Schuff, S. (2017). Removal of curtaining effects by a variational model with directional forward differences, *Computer Vision and Image Understanding* **155**, 24--32.