

Application of Machine Learning aided convolution based algorithm for nuclear track detector (NTD) on MoEDAL image analysis

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Applied Method

- ▶ Mask selection $M(x, y)$ using a suitable track from objects $N(x, y)$ present within the image
- ▶ First, a gaussian mask $G(x, y)$ chosen for deconvolution with $N(x, y)$
- ▶ Next, $M(x, y)$ convolved with entire image
- ▶ Machine learning for thresholding

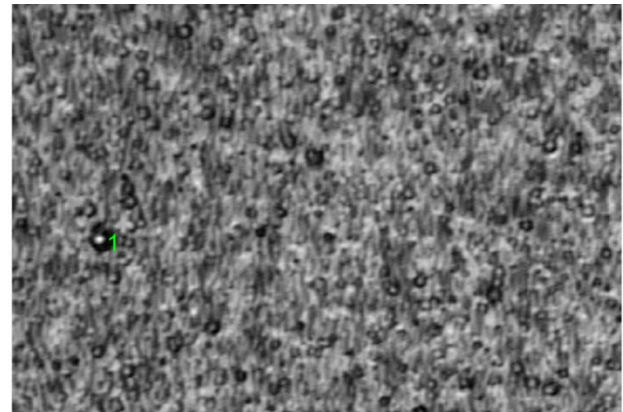
Some results



Image names: cc and d 18 9

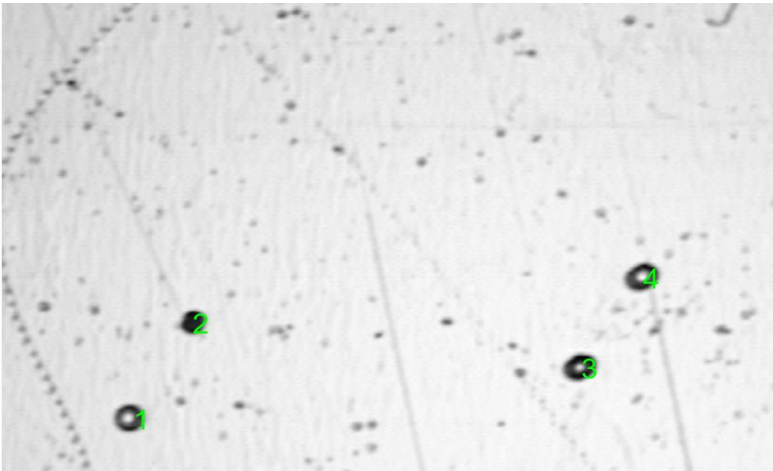


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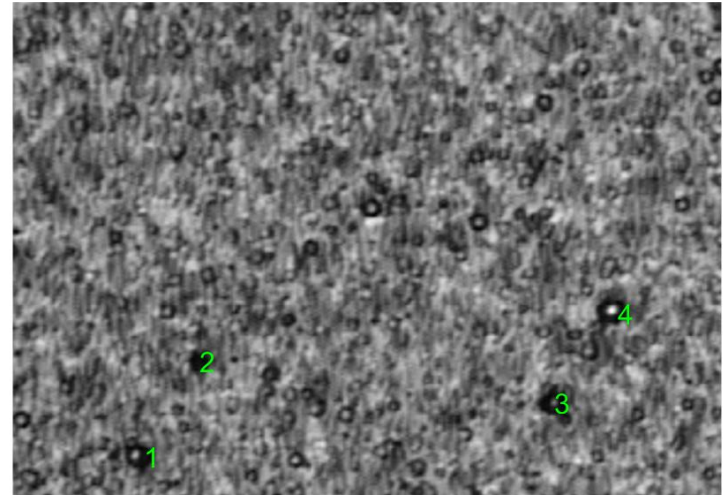


Count: 1

Image names: cc and d 84 9

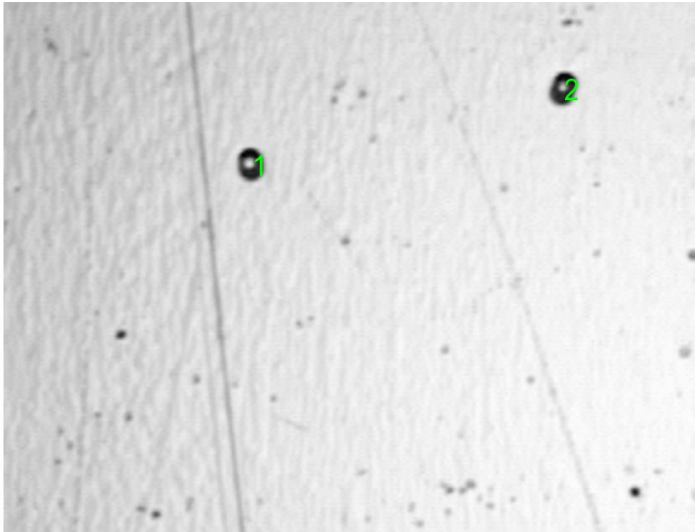


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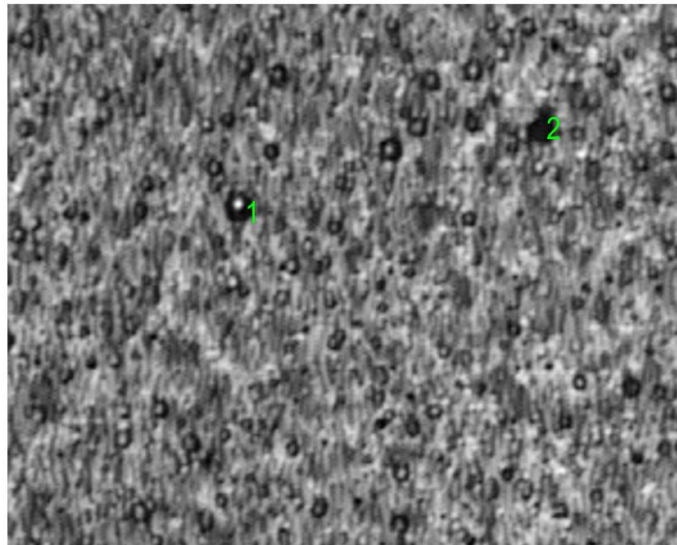


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Image names: cc and d 27 9

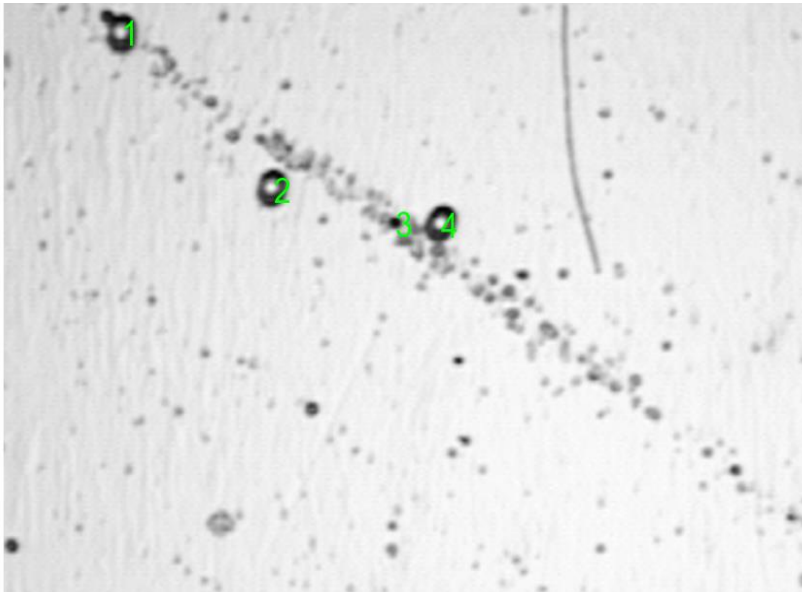


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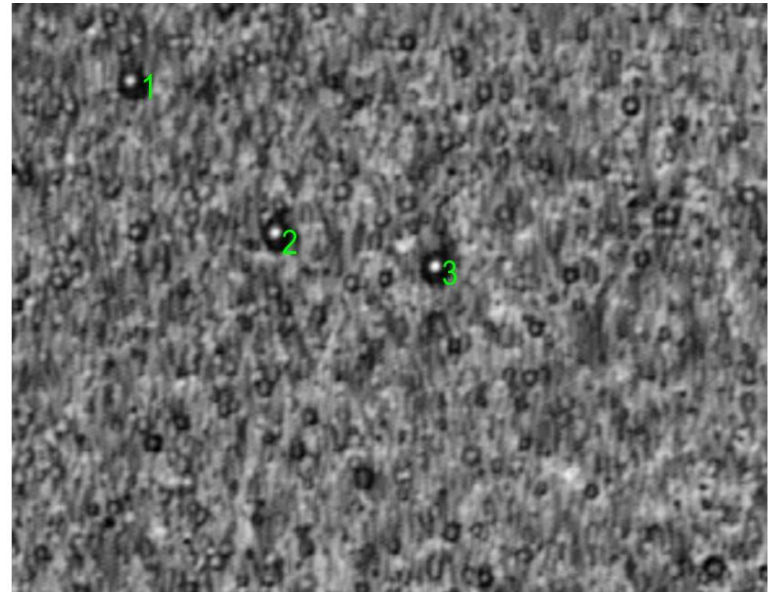


Count: 2

Image names: cc and d 59 9



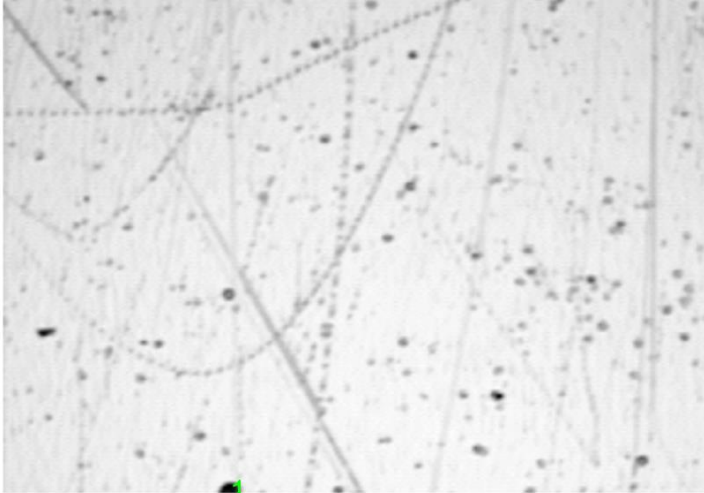
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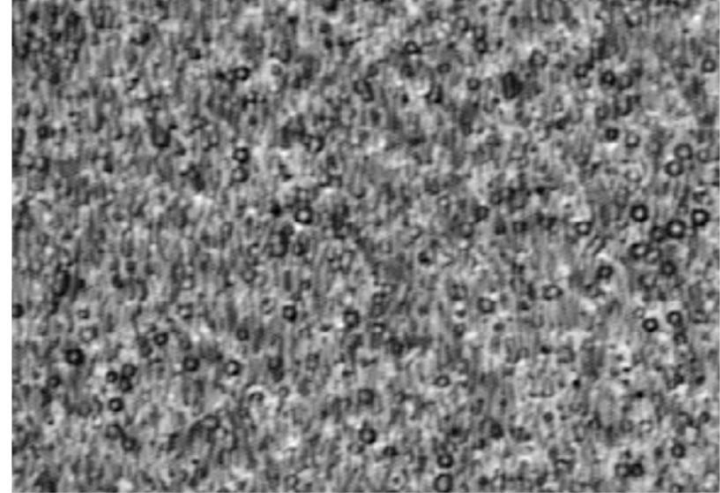
Count: 3

Note: Similar darkness

Image names: cc and d 88 9



Count: 1



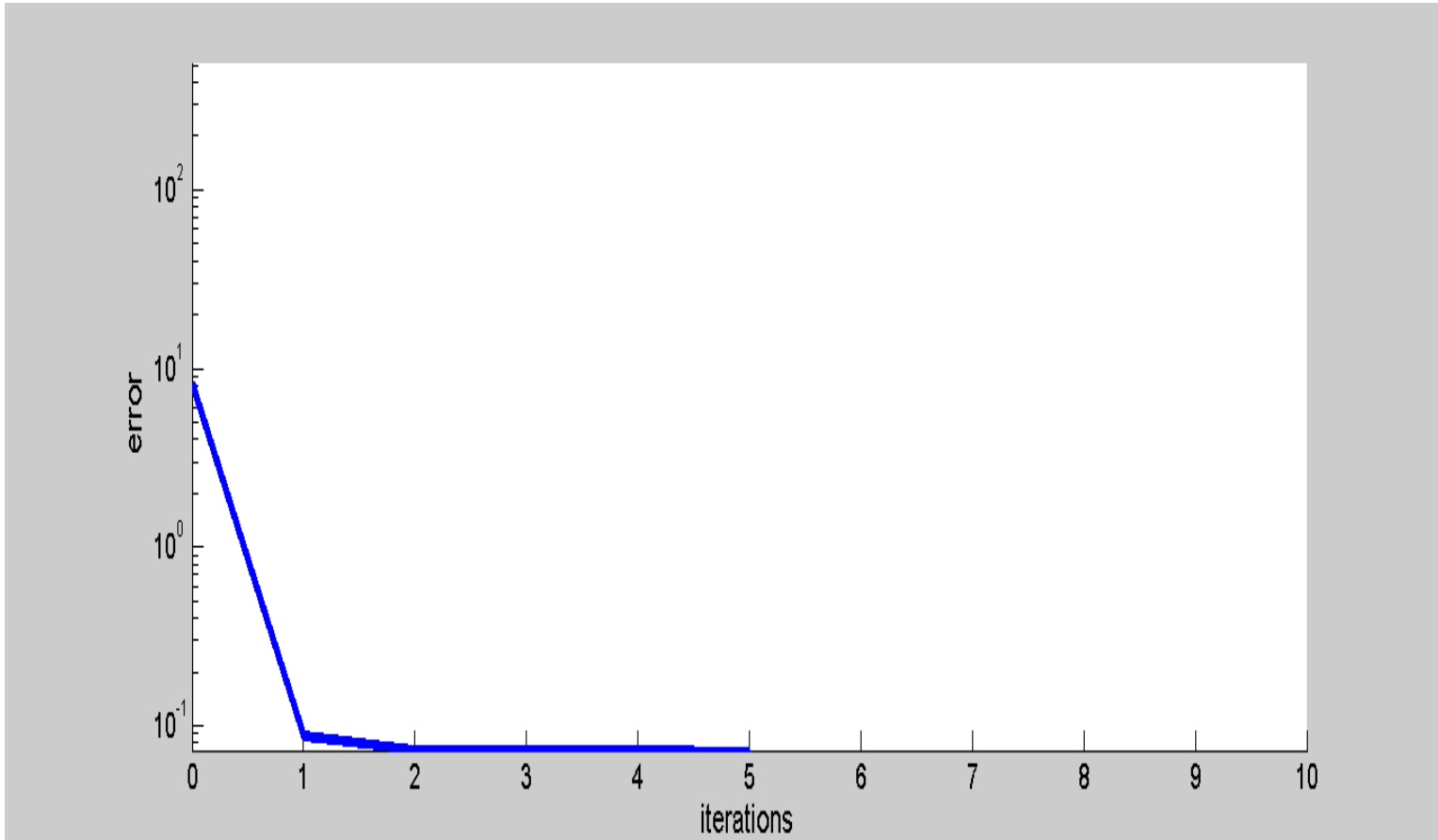
Count: 0

Note: Alignment

Accuracy

IMAGE TYPE	MANUAL COUNT	AUTOMATED COUNT	FALSE POSITIVE	FALSE POSITIVE %	FALSE NEGATIVE	FALSE NEGATIVE %
CLEAN	37	41	4	11	0	0
DIRTY	35	39	5	14	1	3

Error curve



THANK YOU