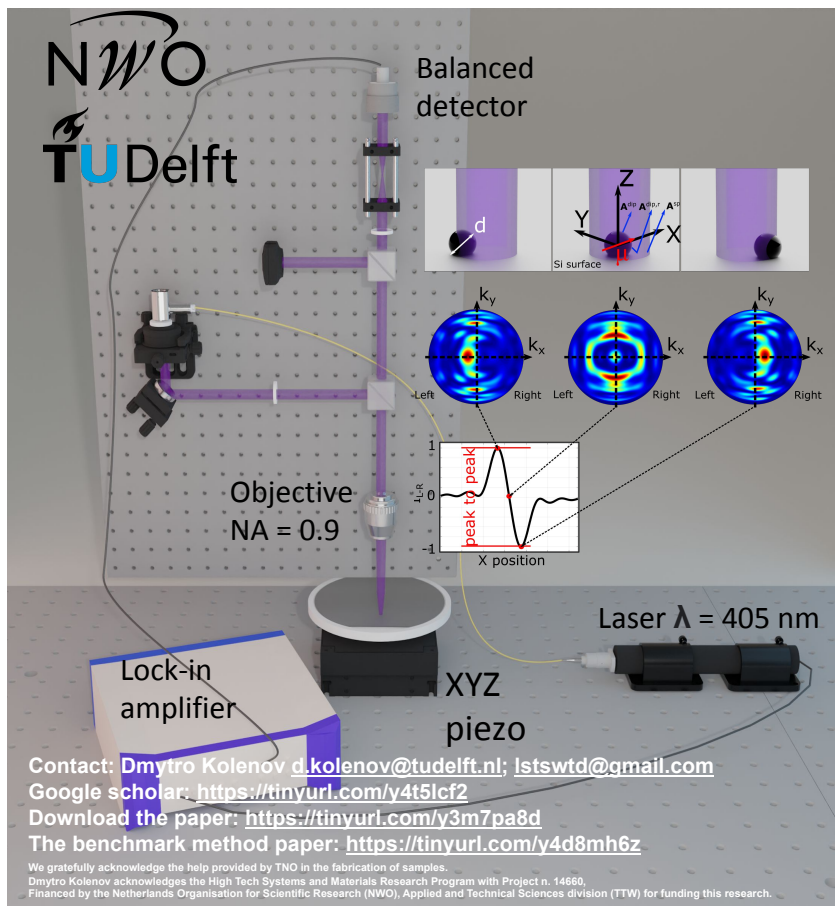


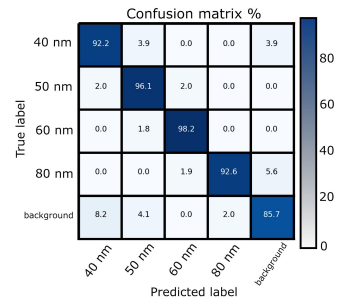
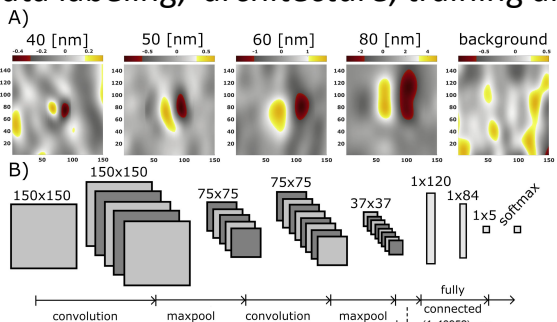
Convolutional neural network for particle classification using scatterometry

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Data labeling, architecture, training and testing.



Accuracy for the test set in the confusion matrix.

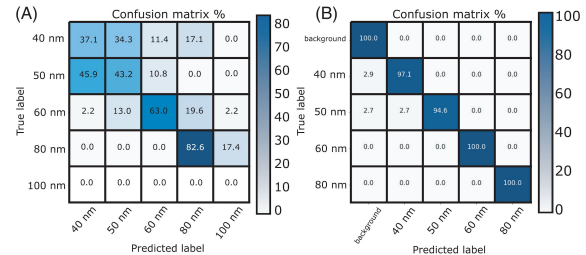
Results:

Table 1. Amount of Images Per Class (Original Dataset)

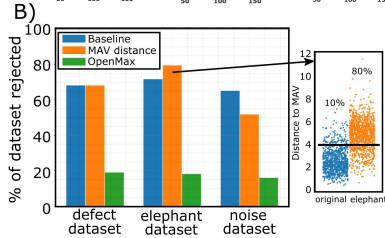
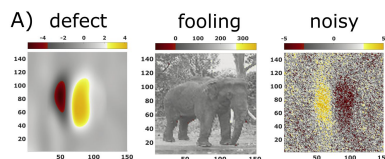
Class	40 nm	50 nm	60 nm	80 nm	Background
# of images	254	253	276	272	247

Table 2. Comparison of Accuracy Per Class between the Proposed CNN and Method Based on Thresholding and Search

	40 nm (35 Images)	50 nm (37 Images)	60 nm (37 Images)	80 nm (46 Images)
Thresholding CNN	0.37	0.43	0.63	0.82
Proposed CNN	0.97	0.94	1	1



Confusion matrices comparing classification tendencies between predicted and true labels by (A) thresholding and (B) CNN approach.



(A) Three types of open-set examples (B) Comparison among three unknown detection methods as applied to the open-set examples.