RIPTIDE

CNN for track classification/regression

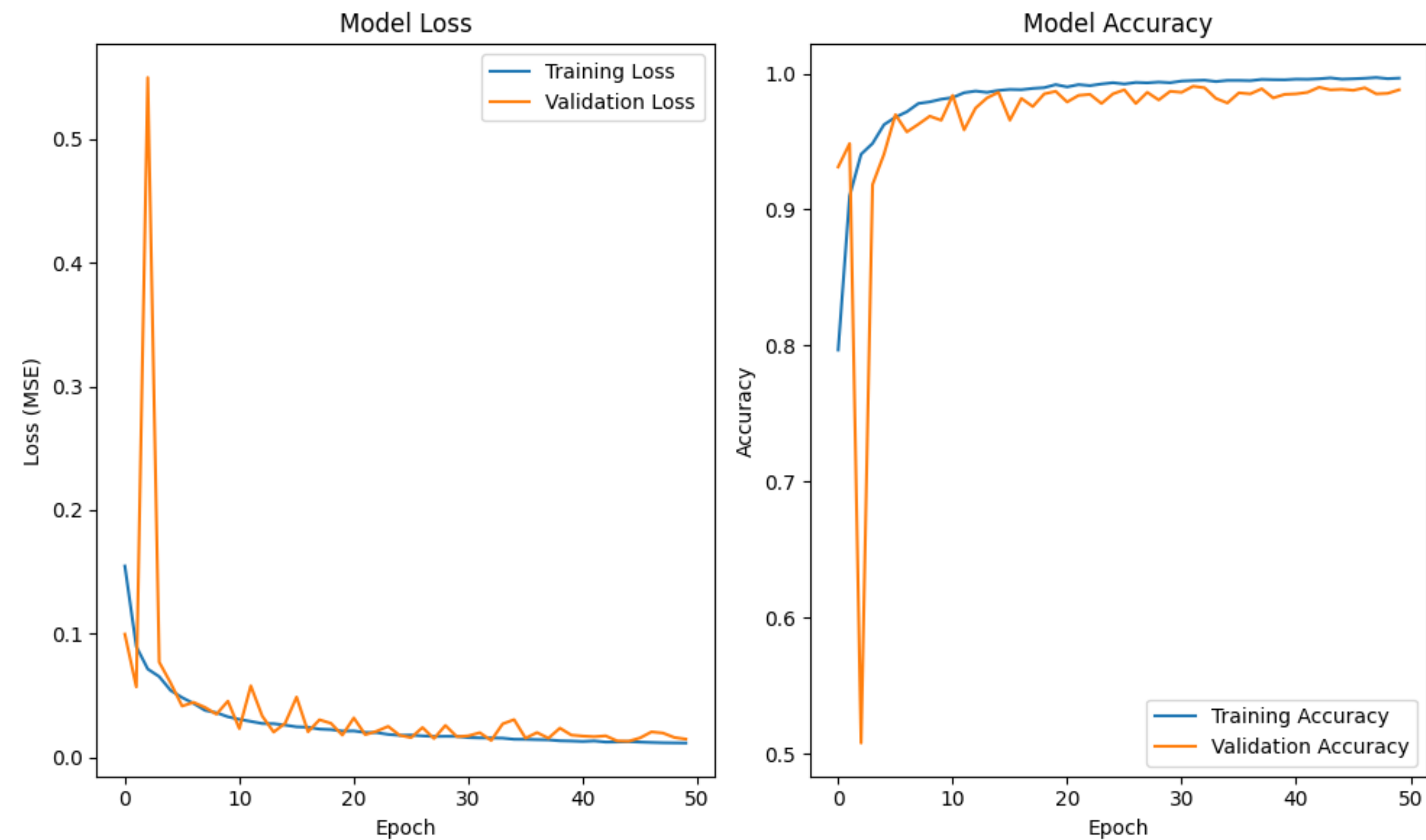Samuele Lanzi - 12/06/2024

Classification

Create dataset

CNN architecture

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 75, 75, 32)	320
max_pooling2d (MaxPooling2D)	(None, 37, 37, 32)	0
dropout (Dropout)	(None, 37, 37, 32)	0
conv2d_1 (Conv2D)	(None, 35, 35, 64)	18,496
max_pooling2d_1 (MaxPooling2D)	(None, 17, 17, 64)	0
dropout_1 (Dropout)	(None, 17, 17, 64)	0
conv2d_2 (Conv2D)	(None, 15, 15, 128)	73,856
max_pooling2d_2 (MaxPooling2D)	(None, 7, 7, 128)	0
dropout_2 (Dropout)	(None, 7, 7, 128)	0
flatten (Flatten)	(None, 6272)	0
dense (Dense)	(None, 512)	3,211,776
dropout_3 (Dropout)	(None, 512)	0
dense_1 (Dense)	(None, 1)	513

Classification results

▸ Very good accuracy ~ 99%

▸ It seems to be a good classifier, we can also try to classify also events with alphas or carbon

Range regression

## Dataset

$+$ Projected length

CNN architecture

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Range regression
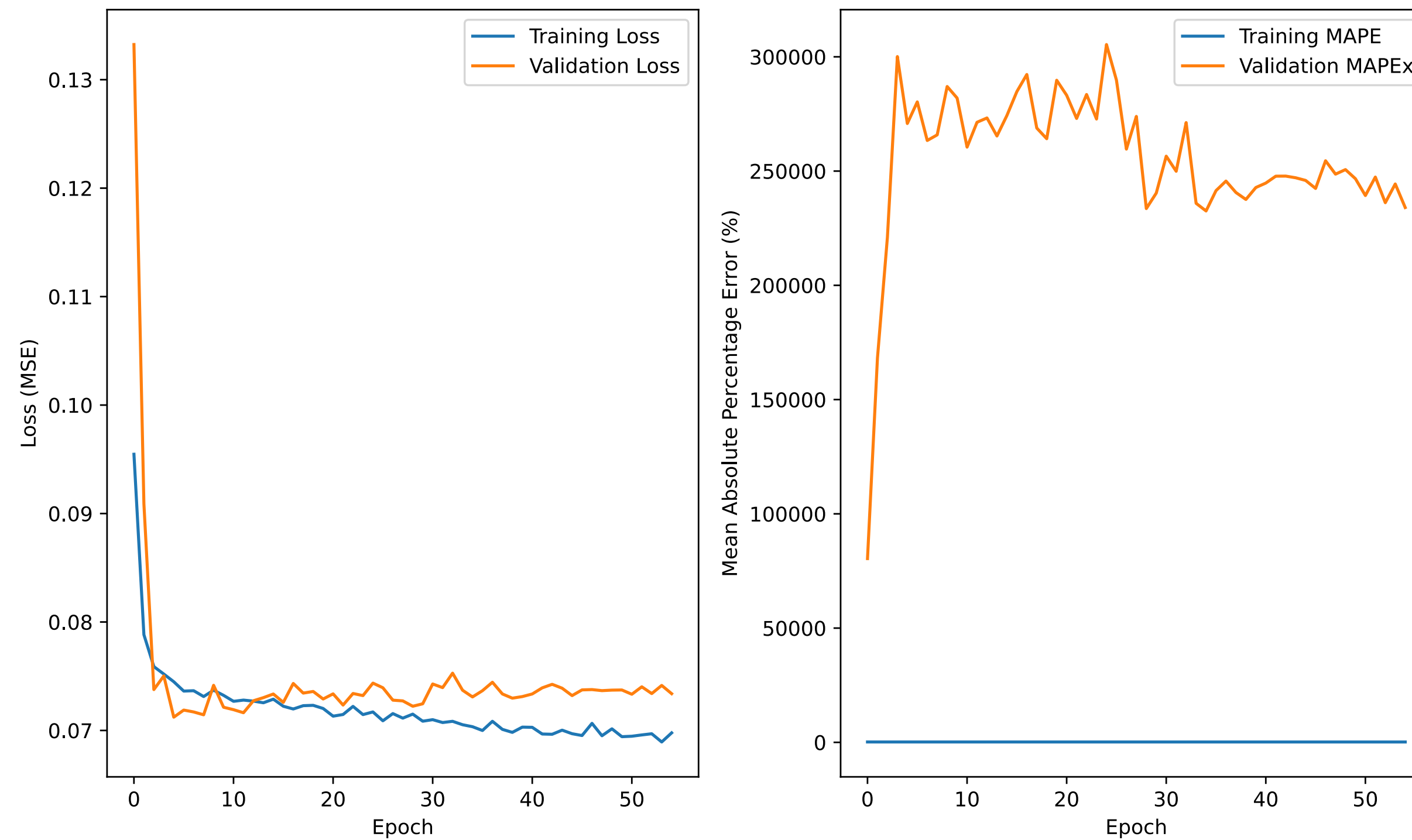
- ▶ Bad MAPE 🙁

- ▶ Possible explanation: CNN sees mostly black pixels

Remove aberrations using CNNs
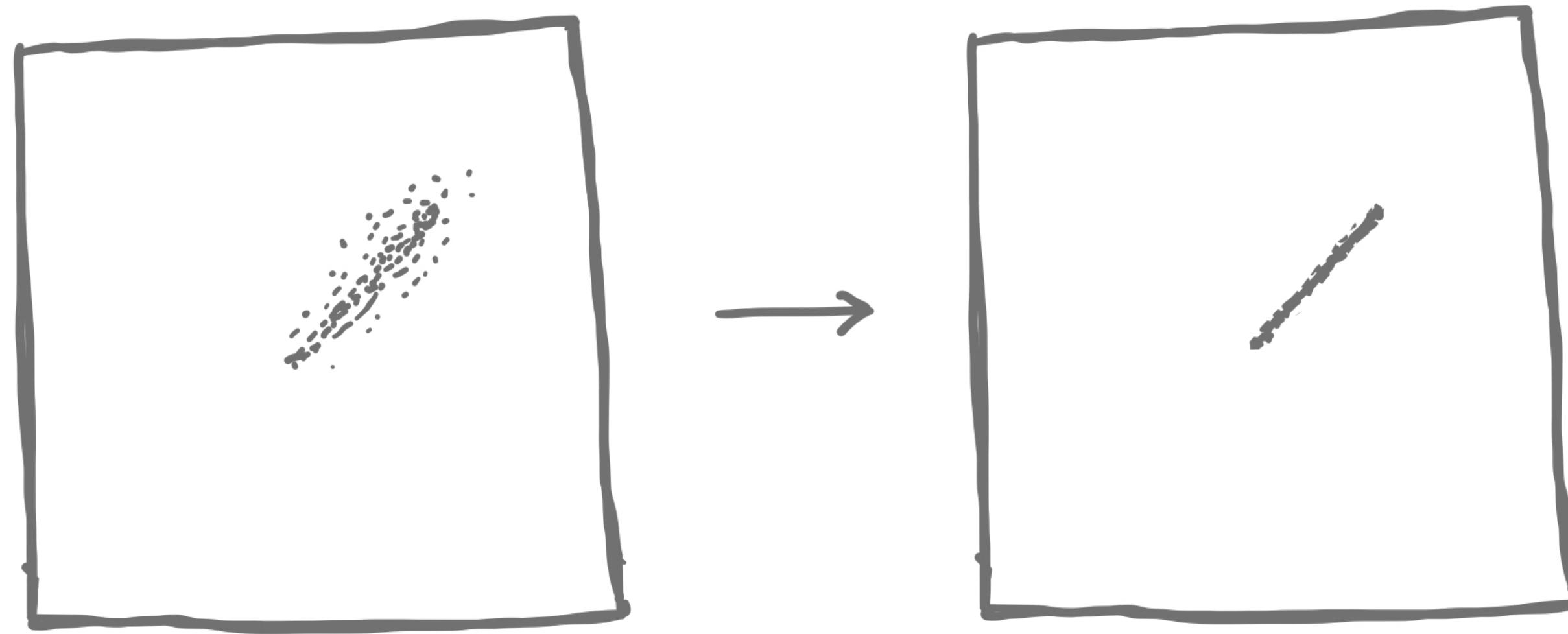
▸ Then calculate range using deterministic algorithm (see previous presentations)