

# Traffic anomaly detection

## Training Step 1

Input Frame + Mask  
targeted vehicle



Training data 1

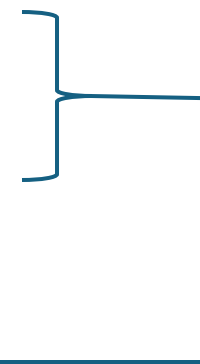
CNN  
Uncertainty

Position 1s later

$\mu, \Sigma$  Prediction

$(x, y)$  Target

NNL loss



# Traffic anomaly detection

## Training Step 2

Input Frame + Mask  
targeted vehicle



Training data 2

CNN  
Uncertainty  
Inferencing

Position 1s later

$\mu, \Sigma$  Prediction  
 $(x, y)$  Target

$N(\mu, \Sigma)$

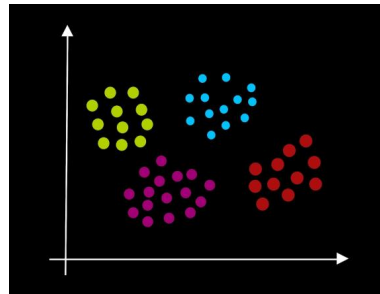
$P(y|\mu, \Sigma)$

< threshold o.  $|\Sigma|$   
too large

> threshold &  
 $|\Sigma|$  not too  
large

No Anomaly

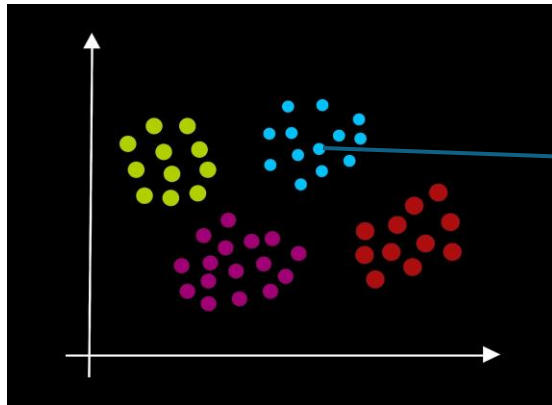
Clustering of (input-  
position,  $y$ , prediction  
parameter)



# Traffic anomaly detection

## Training Step 3

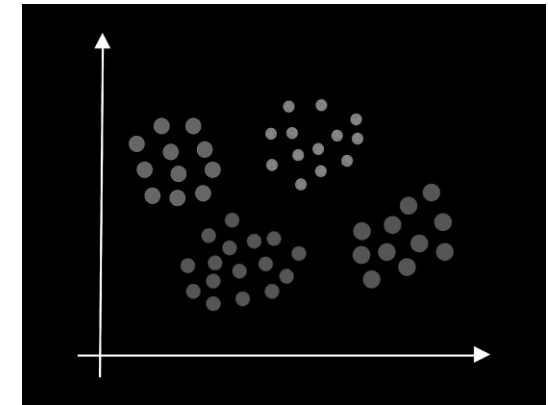
Labelling of Clusters as **Anomaly/no Anomaly** through classification of one representative pro Cluster (=corresponding video clip) by a human



Training data 2



Labelling



Prediction  
**Anomaly/ no Anomaly**

Binary  
Classifier

Training

# Traffic anomaly detection

## Anwendung

Input Frame + Mask  
targeted vehicle



Test data

CNN  
Uncertainty  
Inferencing

Position 1s later

$\mu, \Sigma$  Prediction  
 $(x, y)$  Target

$N(\mu, \Sigma)$

$P(y|\mu, \Sigma)$

< threshold or  $|\Sigma|$   
too large

> threshold &  
 $|\Sigma|$  not too  
large

No Anomaly

(input-position, y,  
prediction params)

Binary  
Classifier

Update

Prediction

Anomaly/ no Anomaly

User Feedback:  
Confirmation or Disagreement