## [T-17] Direct Density Ratio Estimation with Convolution Neural Networks with Application in Outlier Detection

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 We propose to use <u>convolutional neural</u> <u>networks (CNN) in density ratio estimation</u>

$$\hat{r}(x) = g_L(x) \qquad r(x) = \frac{p_{\rm tr}(x)}{p_{\rm te}(x)}$$
Input  $x$ 

Convolutions (5x5 mask)

Sub-samplings (2x2 mask)

Convolutions (3x3 mask)

Convolutions (2x2 mask)

• Proposed method outperforms in **inlier-based outlier detection** experiments.

