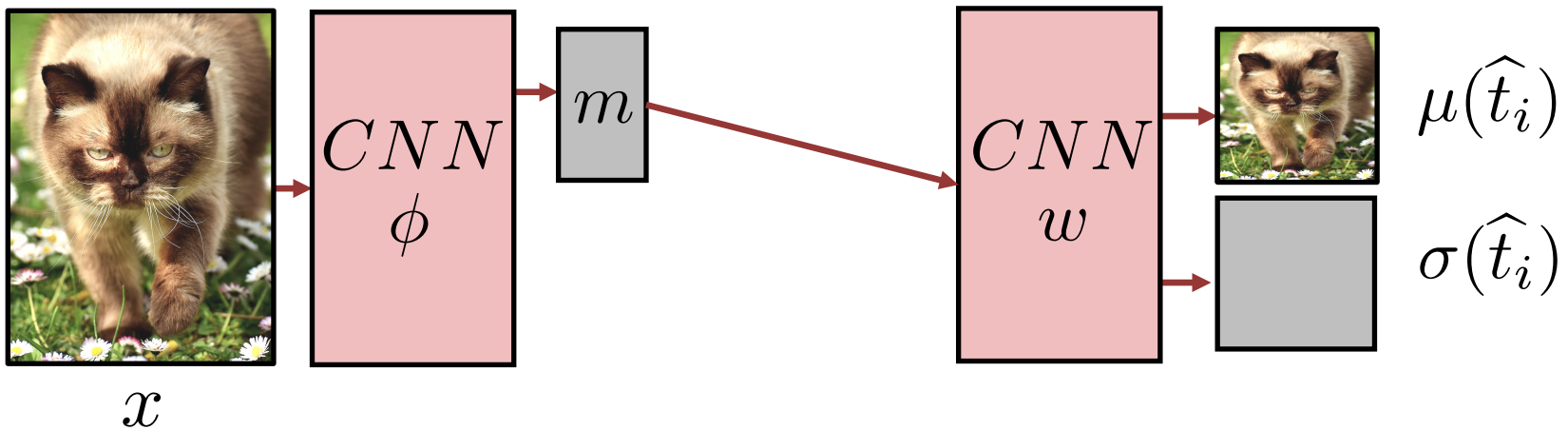# Scaling up Variational EM

$$\underset{w,\phi}{\text{maximize}} \quad \sum_i \mathbb{E}_{q_i} \log \frac{p(x_i \mid t_i, w) p(t_i)}{q_i(t_i)}$$

$$\text{subject to} \quad q_i(t_i) = \mathcal{N}(m(x_i, \phi), \text{diag}(s^2(x_i, \phi)))$$

If $s(x) = 0$ then $\widehat{t}_i = m(x_i, \phi)$: usual autoencoder