

Open-set recognition: A good Closed set is all we need?

lets assume:

closed set

$$\mathcal{D}_{\text{train}} = \left\{ (x_i, y_i) \right\}_{i=1}^N \subset \underbrace{\mathcal{X} \times \mathcal{C}}_{\substack{\text{input} \\ \text{space}}} \quad \downarrow \substack{\text{set of} \\ \text{known class}}$$
$$\mathcal{D}_{\text{test-train}} = \left\{ (x_i, y_i) \right\}_{i=1}^m \subset \mathcal{X} \times \mathcal{C}$$

model returns $p(y|x)$

However, given unknown class \mathcal{U}

$$\mathcal{D}_{\text{test-open}} = \left\{ (x_i, y_i) \right\}_{i=1}^m \subset \mathcal{X} \times \underbrace{(\mathcal{C} \cup \mathcal{U})}_{\substack{\text{union of} \\ \text{known \& unknown}}}$$

model returns: Distribution $p(y|x, y \in \mathcal{C})$ & confidence score $s(y \in \mathcal{C}|x)$