

CNN Results: 20-35 Crossings

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The same CNN and ViT used in the initial study were fine-tuned on a new dataset \mathcal{D} , where:

$$\begin{aligned}\mathcal{D} &= \mathcal{D}_{\text{train}} \cup \mathcal{D}_{\text{val}} \cup \mathcal{D}_{\text{test}}, \\ |\mathcal{D}| &= 560,000 \text{ diagrams}, \\ |\mathcal{D}_{\text{train}}| &= 448,000 \text{ diagrams}, \\ |\mathcal{D}_{\text{val}}| &= |\mathcal{D}_{\text{test}}| = 56,000 \text{ diagrams}.\end{aligned}$$

All splits contained knots with n crossings where $n \in N$ and $N = \{20, 21, \dots, 35\}$. Each crossing count n contributed equally to a split. In each split, there were an equal number of unknots and non-trivial knots with n crossings.

CNN Results

CNN TP: True Unknots Predicted as Unknots

CNN FN: True Unknots Predicted as Knots

CNN TN: True Knots Predicted as Knots

CNN FP: True Knots Predicted as Unknots