

# Results: [20, 35] Crossings

Jake Weatherhead

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The CNN (88M params) and ViT (86M params) were fine-tuned on a new dataset  $\mathcal{D}$  comprising unknot  $\mathcal{U}$  and non-trivial knot  $\mathcal{K}$  diagrams partitioned into three disjoint data splits  $S = \{\mathcal{D}_{\text{train}}, \mathcal{D}_{\text{val}}, \mathcal{D}_{\text{test}}\}$ , where:

$$\mathcal{D} = \bigcup_{s \in S} s$$

$$|\mathcal{D}| = 560,000 \text{ diagrams,}$$

$$|\mathcal{D}_{\text{train}}| = 0.8 \cdot |\mathcal{D}| = 448,000 \text{ diagrams,}$$

$$|\mathcal{D}_{\text{val}}| = |\mathcal{D}_{\text{test}}| = 0.1 \cdot |\mathcal{D}| = 56,000 \text{ diagrams,}$$

$$\text{where } \forall s \in S, s \in \mathcal{U} \cup \mathcal{K} \text{ and } |\mathcal{U}| = |\mathcal{K}|.$$

Each split in  $S$  contained knots with  $n \in N := \{20, 21, \dots, 35\}$  crossings. For all distinct  $a, b \in N$ , each split contained an equal number of  $a$ -crossing and  $b$ -crossing unknot and non-trivial knot diagrams.

## Learning Curves

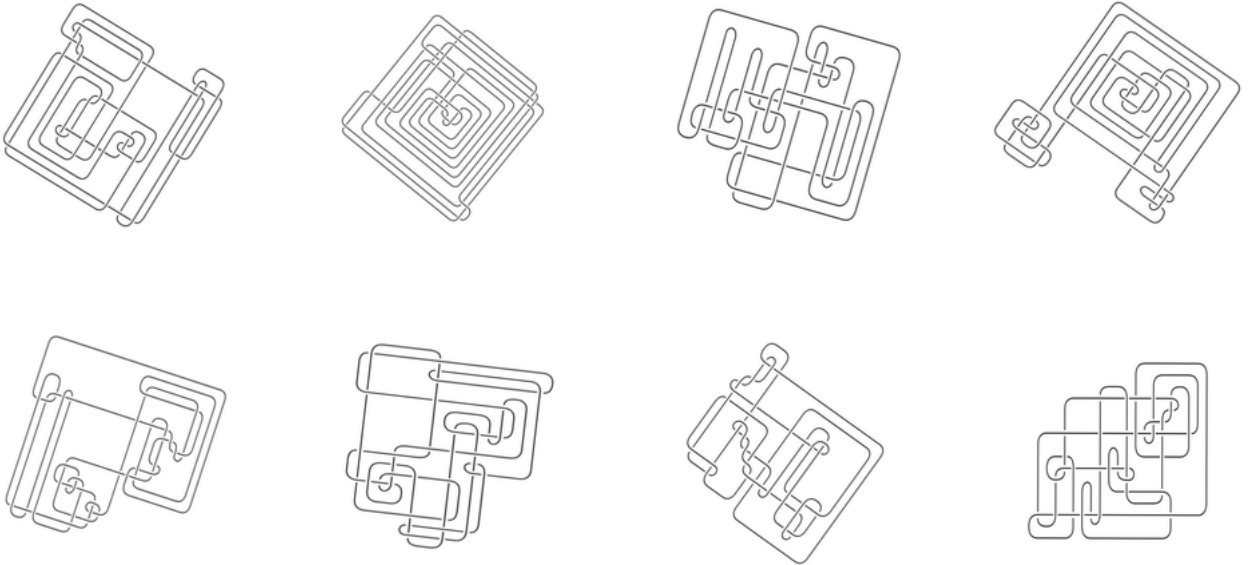


Figure 1: TBC

## CNN\* Saliency Maps

Saliency maps from the best-performing CNN (CNN\*) on  $\mathcal{D}_{\text{test}}$ .

**CNN\* True Positives: True Unknots Predicted as Unknots**

**CNN\* False Negatives: True Unknots Predicted as Knots**

**CNN\* True Negatives: True Knots Predicted as Knots**

**CNN\* False Positives: True Knots Predicted as Unknots**

## ViT\* Saliency Maps

Saliency maps from the best-performing ViT (ViT\*) on  $\mathcal{D}_{\text{test}}$ .

**ViT TP: True Unknots Predicted as Unknots**

**ViT FN: True Unknots Predicted as Knots**

**ViT TN: True Knots Predicted as Knots**

**ViT FP: True Knots Predicted as Unknots**