

Weight Fault Experiment Parameters

Ali Asgari, Feb 16th, 2021

SDC

Top “how many?”

3

Misclassified -> Classified?

Ignore

$$sdc = \frac{accuracy_{base} - accuracy_{injection}}{accuracy_{base}}$$

Precision

Quantized?

float64 / float32

No

float32

Fault Decisions **(of more importance)**

Single layer / Multiple layers	Single layer
Target Bits	Exponents (23-30)
Target Variables	Only Conv Kernels
Fault Bias	Flip Whatever Bit Value
Epochs	60

Task Decisions

Model

ResNet50

Training

TensorFlow Pretrained

Classes

17 out of 18 random class

Resolution

224x224 RGB

Image in each class

~10

Dataset

ImageNet 1K

Recovery Decisions

Range Profiling

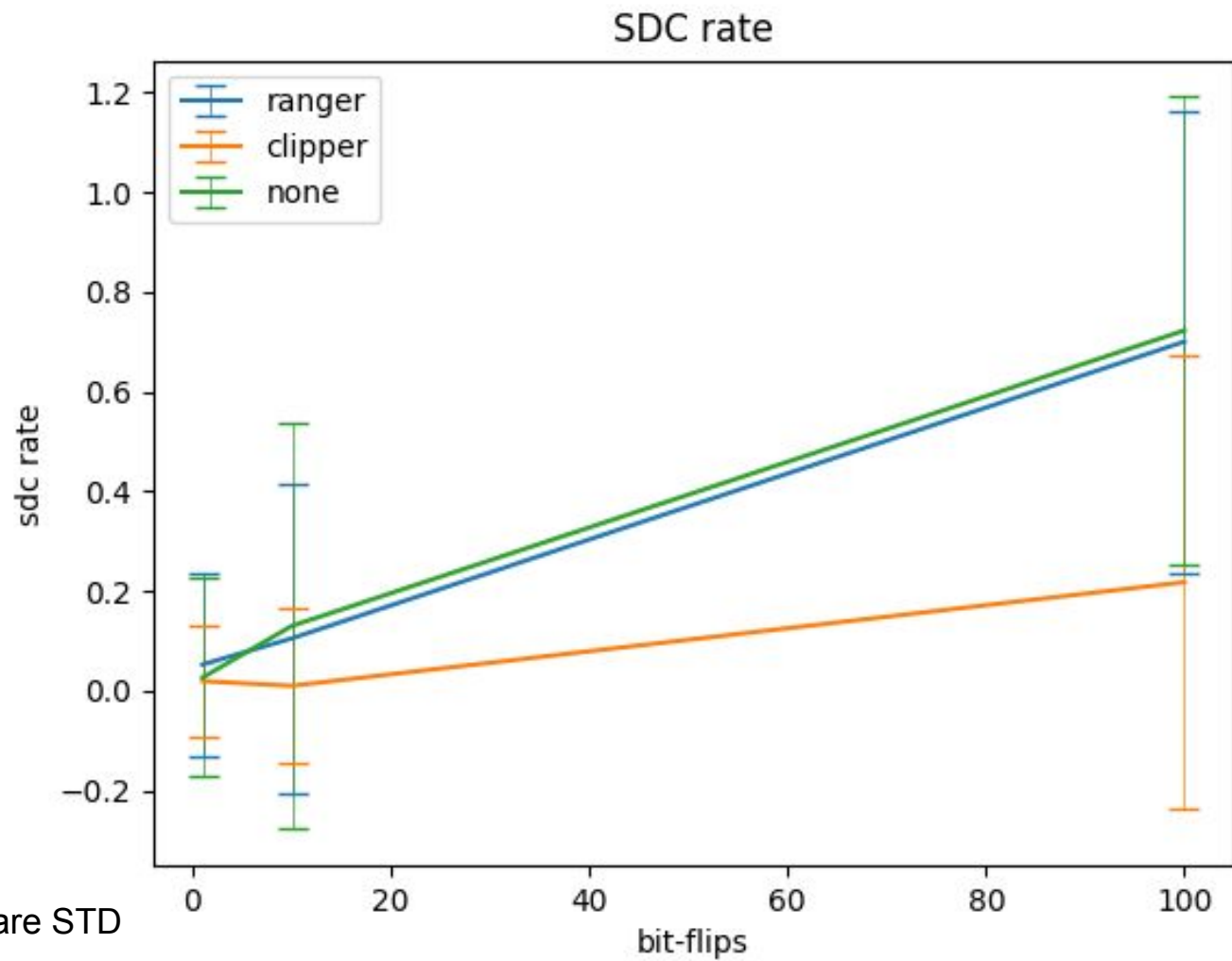
Which Layers?

Variants

Same Inputs as Validation

Relu

Ranger, Zero Out (Clipper)



* Error bars are STD

Discussion

Fault Distribution and Bias?

Information Limits for recovery!