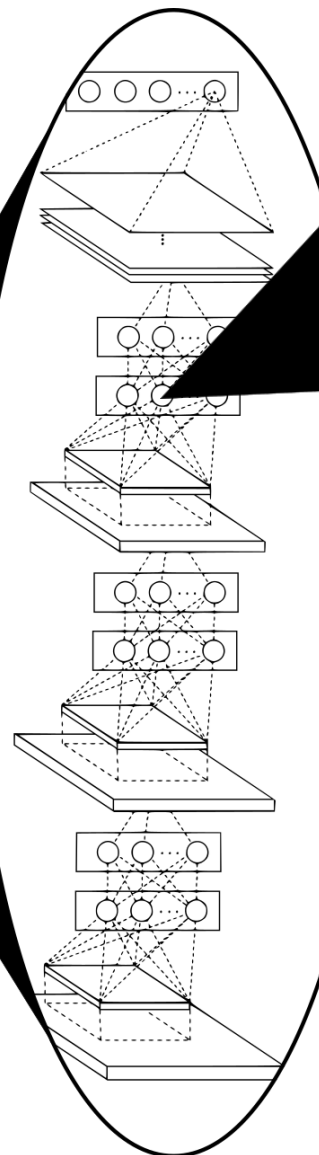
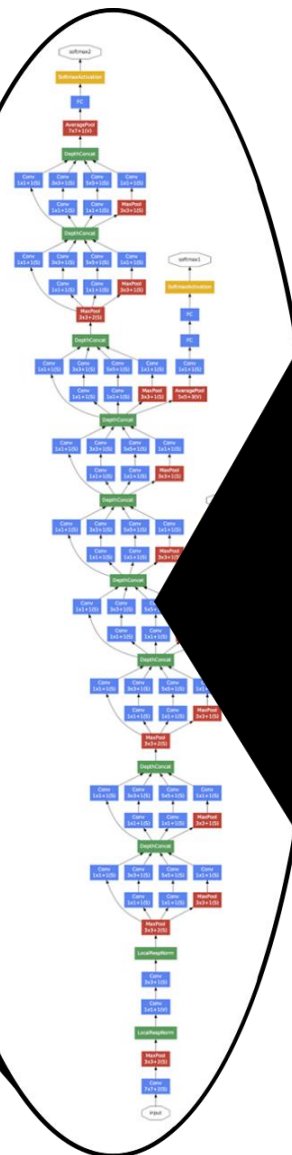
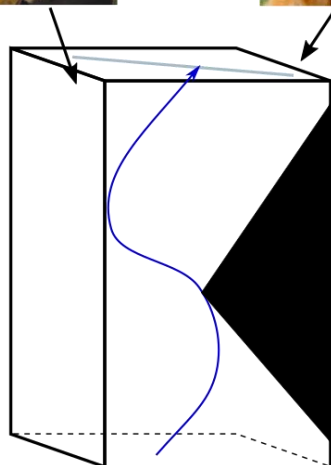


Progressive Stochastic Binarization

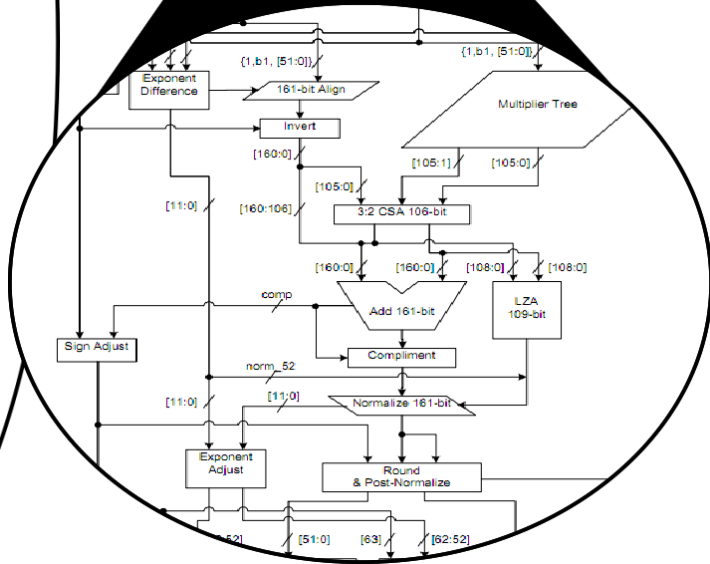
David Hartmann & Michael Wand

Institute of Computer Science, Johannes Gutenberg-University of Mainz

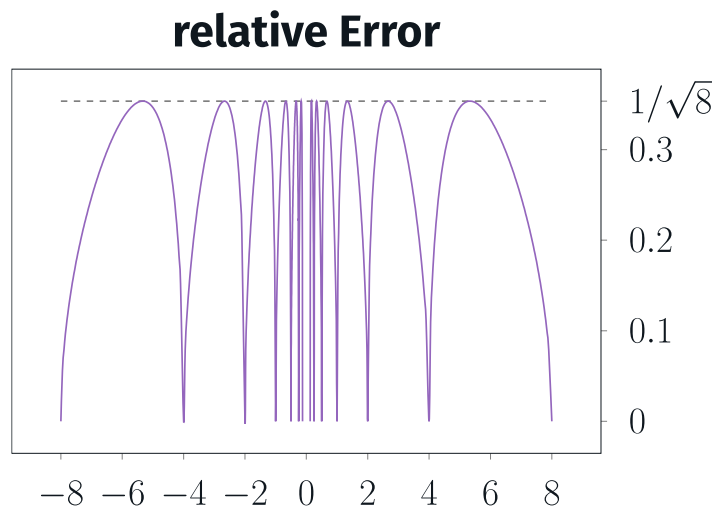


$$y = x \cdot W + b$$

$$\begin{pmatrix} x_1 \cdot w_{11} + x_2 \cdot w_{21} + \dots & x_d w_{d1} + b_1 \\ x_1 \cdot w_{12} + x_2 \cdot w_{22} + \dots & x_d w_{d2} + b_2 \\ x_1 \cdot w_{13} + x_2 \cdot w_{23} + \dots & x_d w_{d3} + b_3 \\ \vdots & \vdots \\ x_1 \cdot w_{1f} + x_2 \cdot w_{2f} + \dots & x_d w_{df} + b_f \end{pmatrix}$$



Stochastic Floats

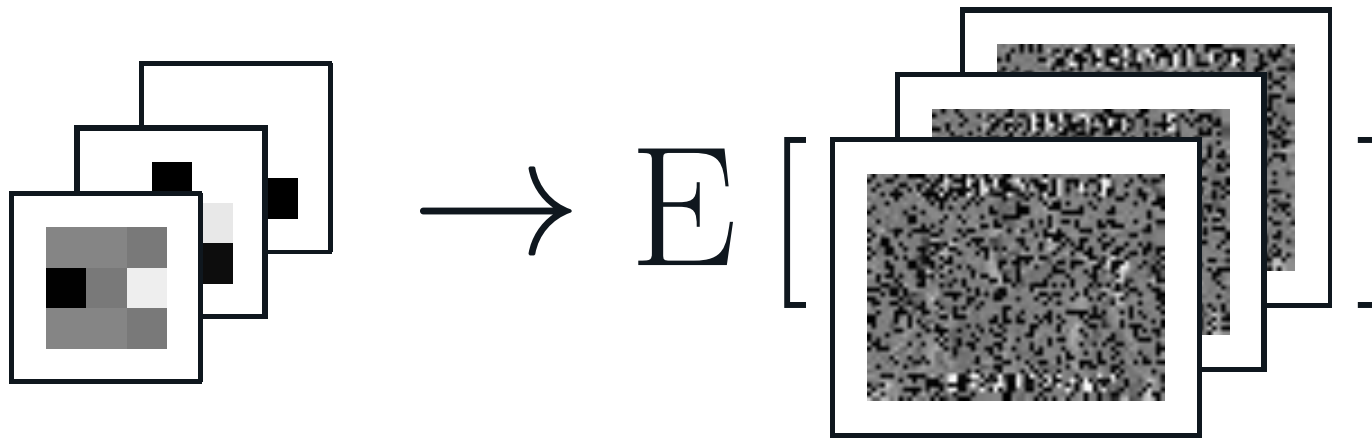


$$w = s \cdot 2^e \cdot m$$



$$w = s \cdot 2^e \cdot (1 + B_p)$$

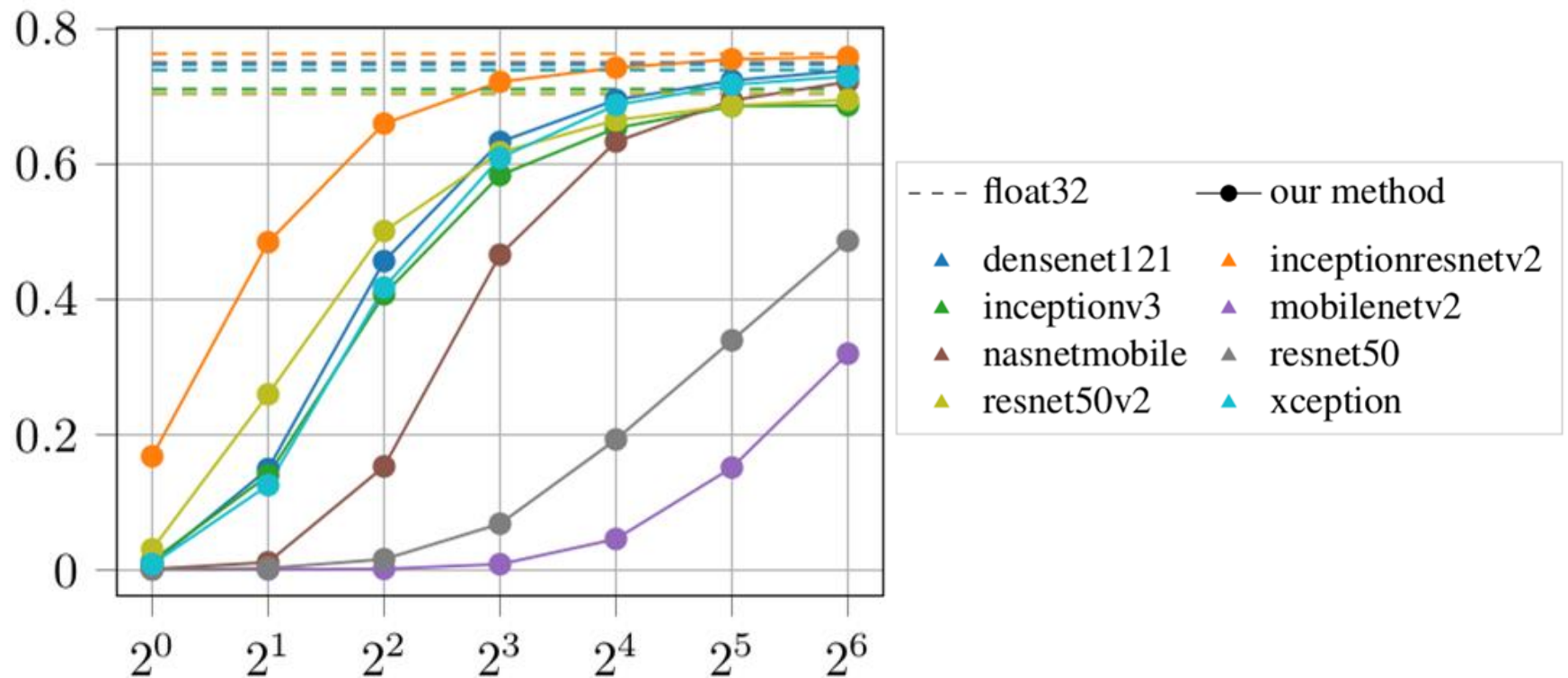
Dynamic Control of Accuracy



Samples of one
stochastic filter

Average of Results

Use with any* Model



*Not with Backbone-Batchnorms

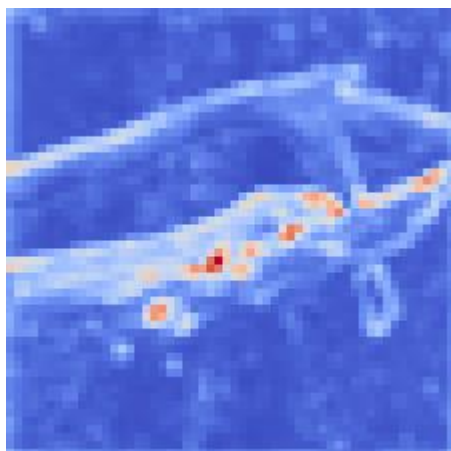
Computational Attention

Approximation Error: blue = smaller error

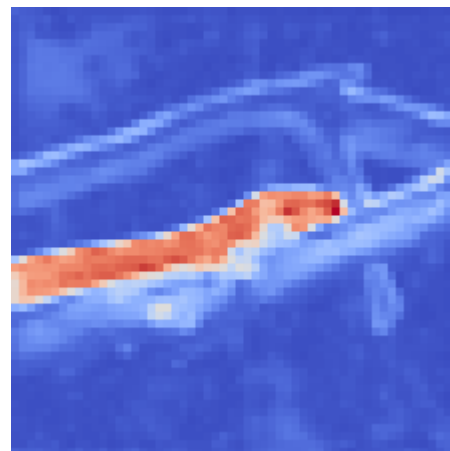
ResNet50v2: Input



Layer 8



Layer 9 (after skip)



Last Conv Layer

