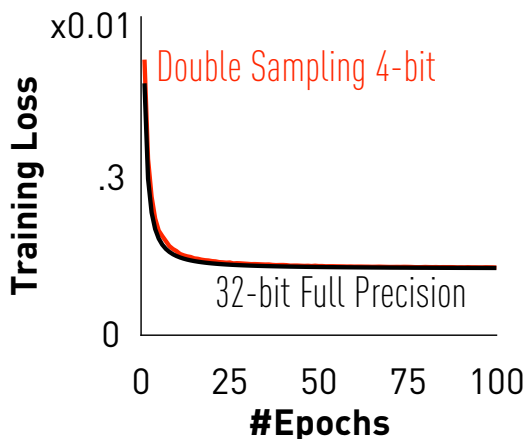
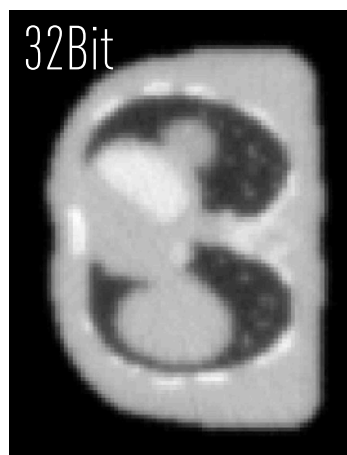


Machine Learning Models	Data Movement Channels			Speed up because of our techniques
	Gradient	Input Samples	Model	
Linear Models	De Sa et al., Alistarh et al., ...	1. Double Sampling 2. Data-Optimal Encoding	Stochastic Rounding	Very Significant Speed up (Up to 10x)
Generalized Linear Models		1. Chebyshev Approximation 2. Data Sketching Heuristics for SVM		Minor/No Speed up
Deep Learning		Courbariaux et al., Rastegari et al., ...	Data-Optimal Encoding	Significant Speed up

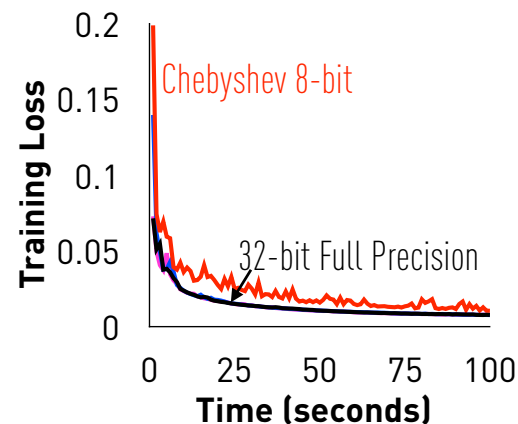
(a) Linear Regression



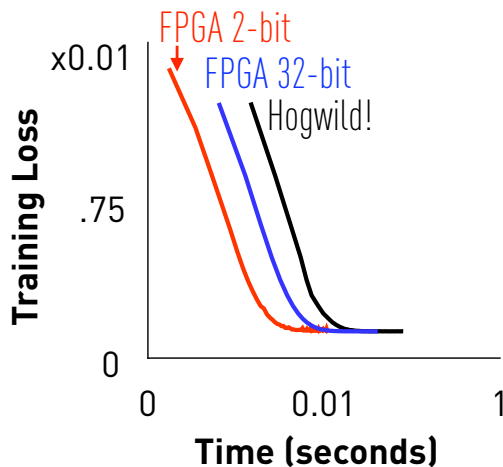
(c) 3D Reconstruction



(d) Non-linear Models



(b) FPGA Speed Up



(d) Deep Learning

