



# Week 11

# Presentation

PHY 496

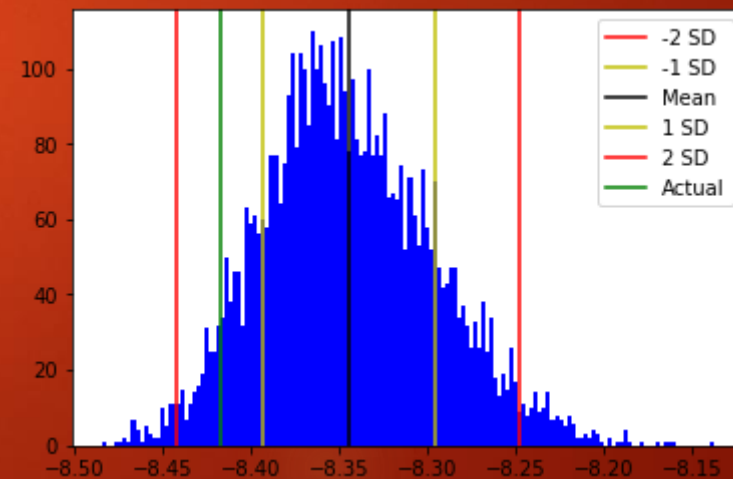
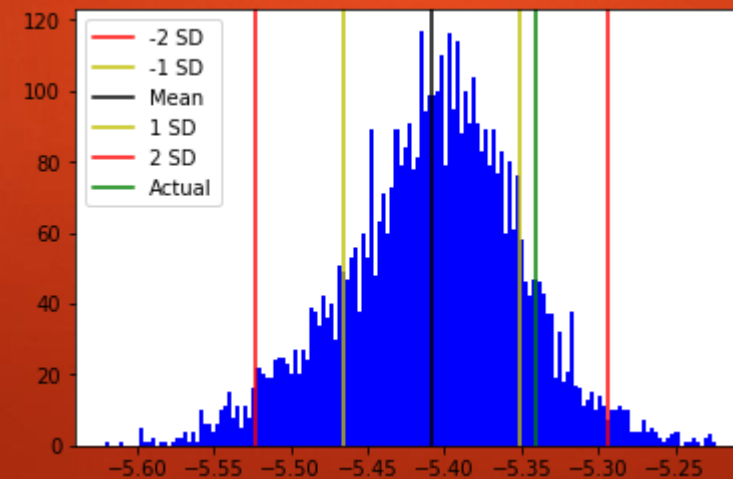
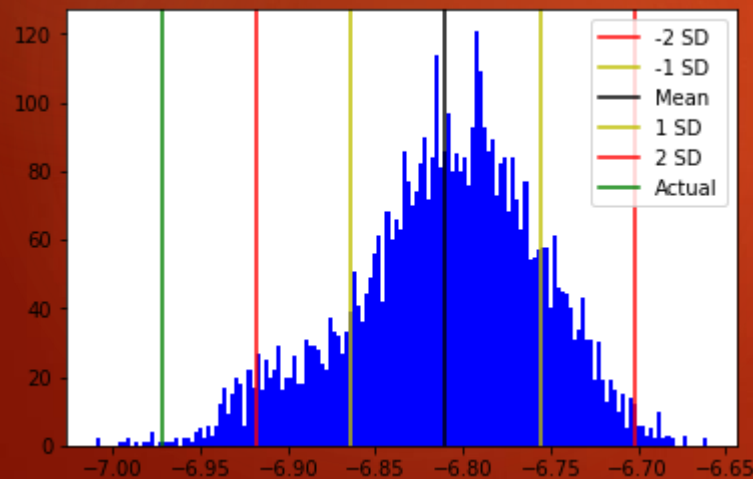
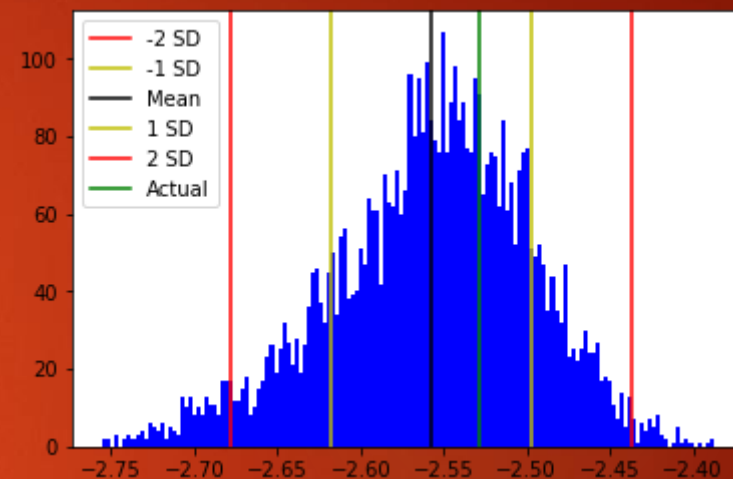
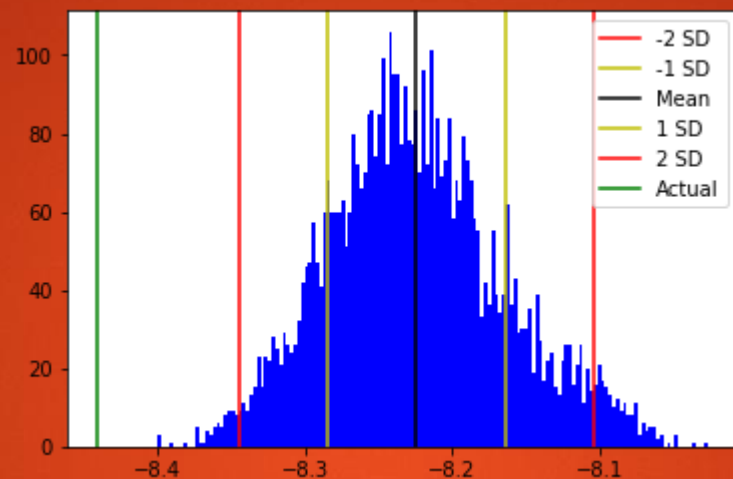
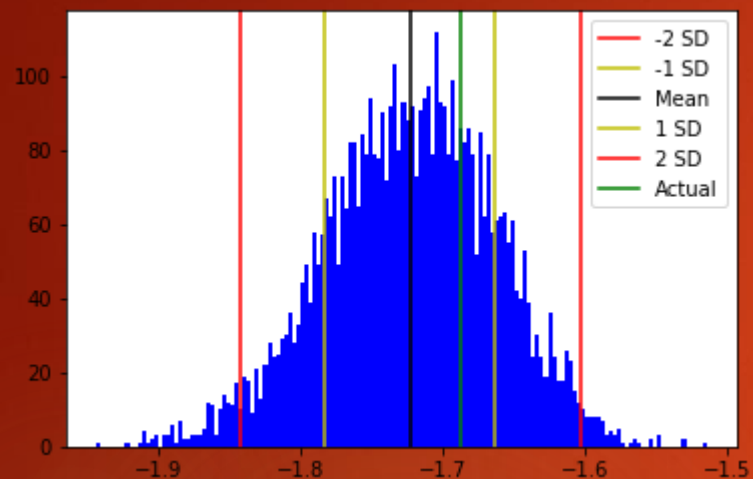
BRADEN KRONHEIM

APRIL 5, 2019

# Summary

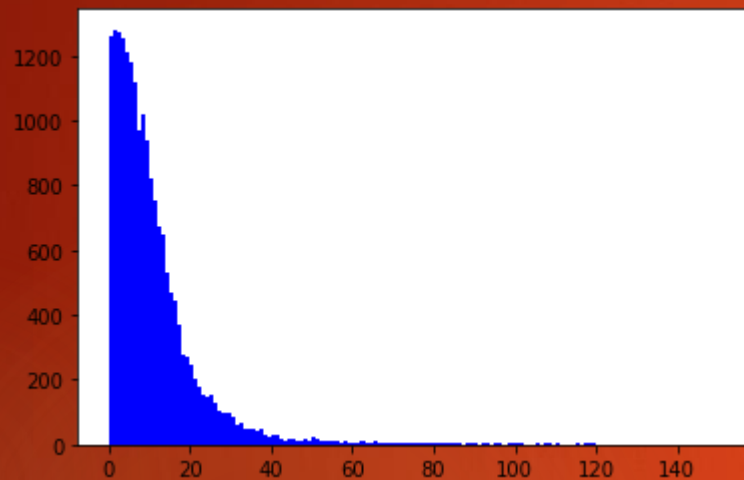
- ▶ Reworked code to streamline run loop and minimize graph changes
  - ▶ This stops the programing from gradually slowing over time and stops unnecessary growth of memory use
- ▶ Implemented a basic method to save networks and load them
  - ▶ This currently assumes a specific network architecture, specifically dense, Relu, dense, Relu, ..., dense, linear
- ▶ Generated sets of 1,000 and 5,000 networks
- ▶ Added seeding for random numbers

# Sample Output (5,000 networks)

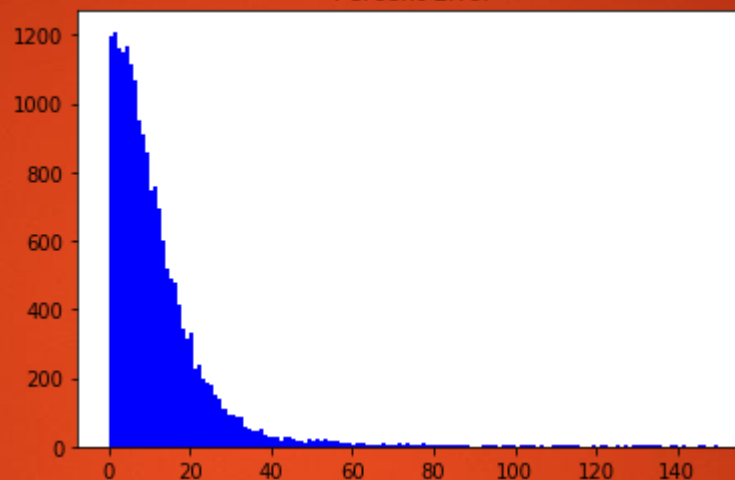


# General % Error

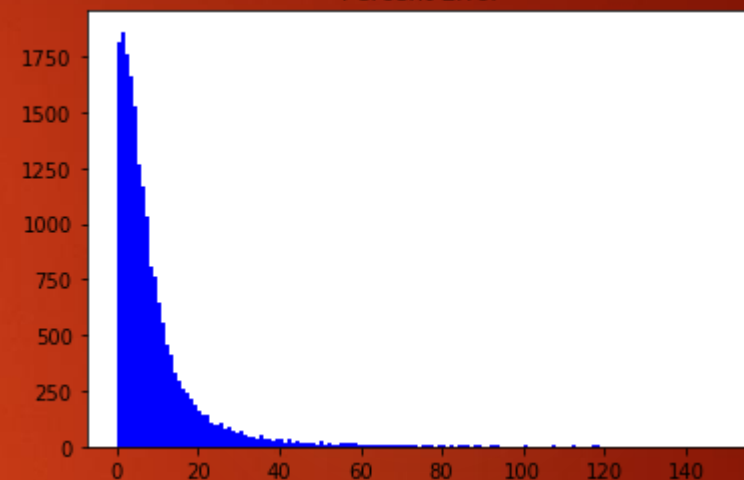
Flipout  
Percent Error



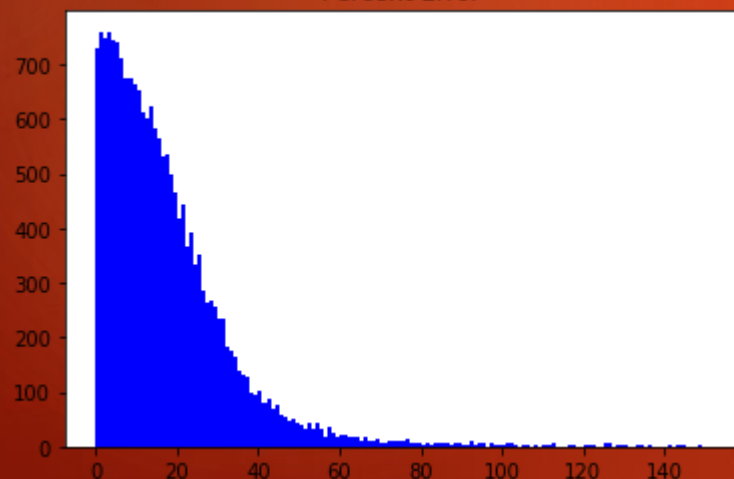
Reparameterization  
Percent Error



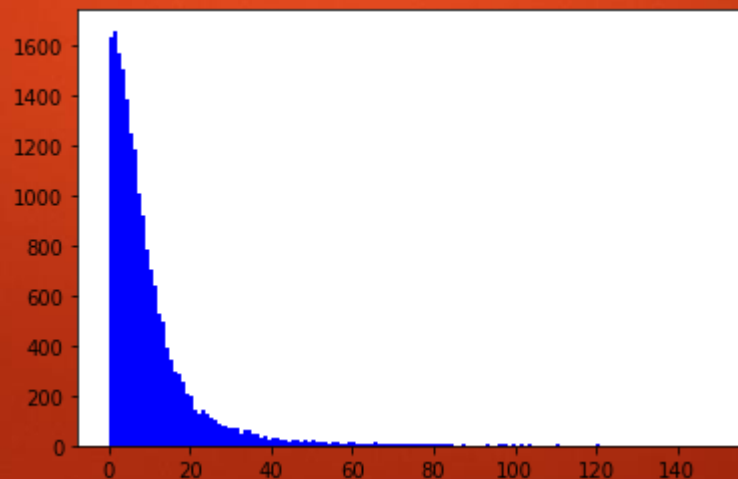
HMC 1000  
Percent Error



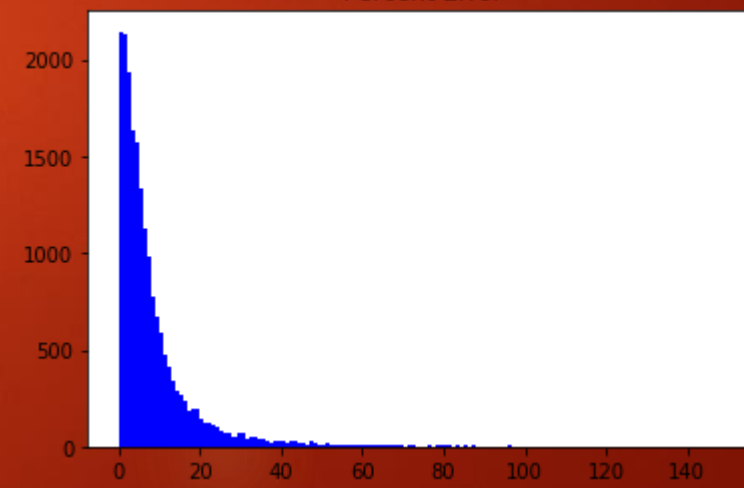
Normal  
Percent Error



HMC 100  
Percent Error



HMC 5000  
Percent Error



# Summary

	Inside 1 SD	Inside 2 SDs	Inside 3 SD3	Outside of 3 SDs	Below min	Above max	Percent Error
Flipout Batched PRELU	25.59	48.12	65.86	34.17	9.01	22.04	11.40
Reparameterization Batched PRELU	39.31	67.16	83.00	17.00	5.02	9.65	13.21
Normal Dense PRELU	N/A	N/A	N/A	N/A	N/A	N/A	18.35
HMC Relu 100	29.88	53.92	70.13	29.88	19.69	15.35	10.56
HMC Relu 1000	46.55	74.33	86.78	13.22	7.33	5.70	9.79
HMC Relu 5000	55.95	81.65	91.29	8.71	4.41	2.90	9.01

# Goals for next week

- ▶ Generalize saving and reading process for networks
- ▶ Create sets with even more networks
- ▶ Clean up code written to streamline the generation process