Week 10 Presentation

PHY 496

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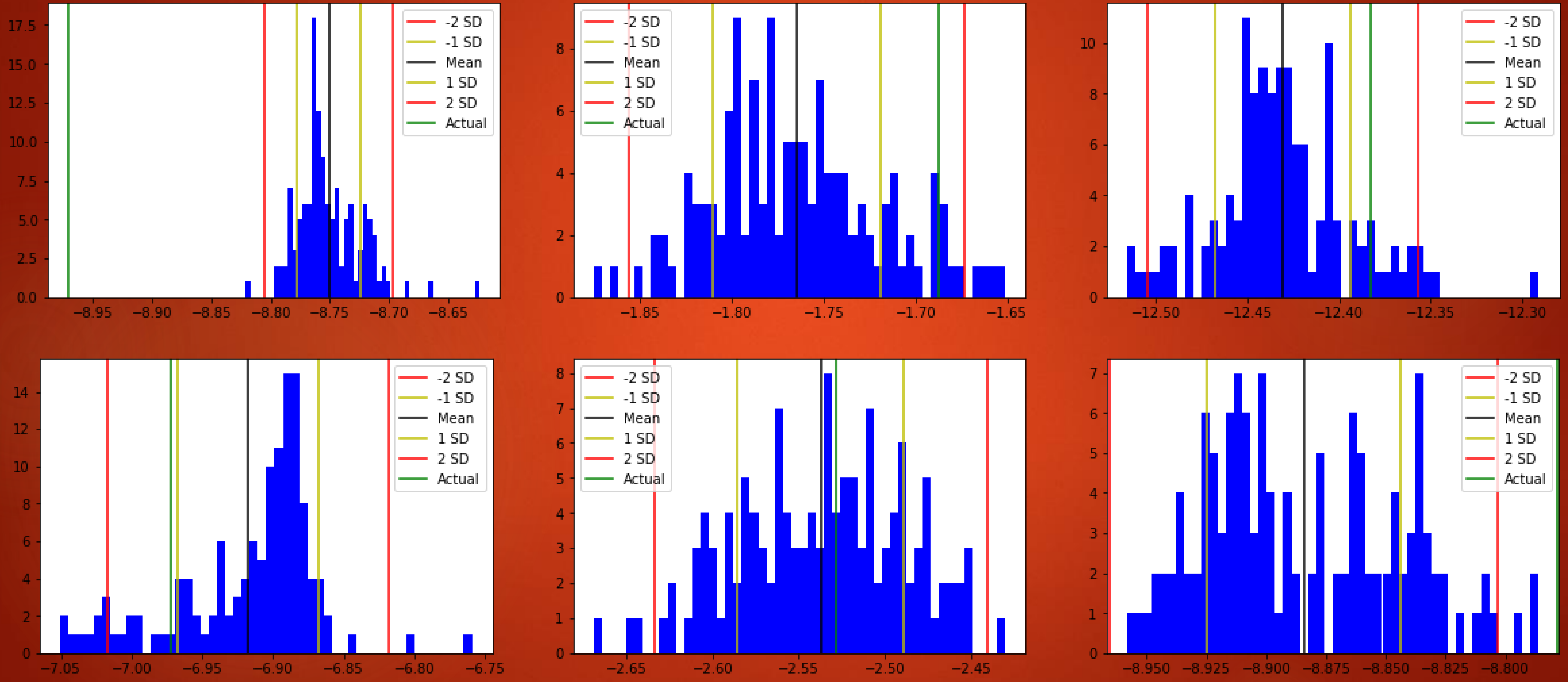
Summary

- Added customizable activation functions
- Added the ability to initialized layers from weight and bias arrays
- Extracted weights and biases from a network with tfp flipout layers and ran the HMC bayesain network with these starting weights and biases

Sample Output

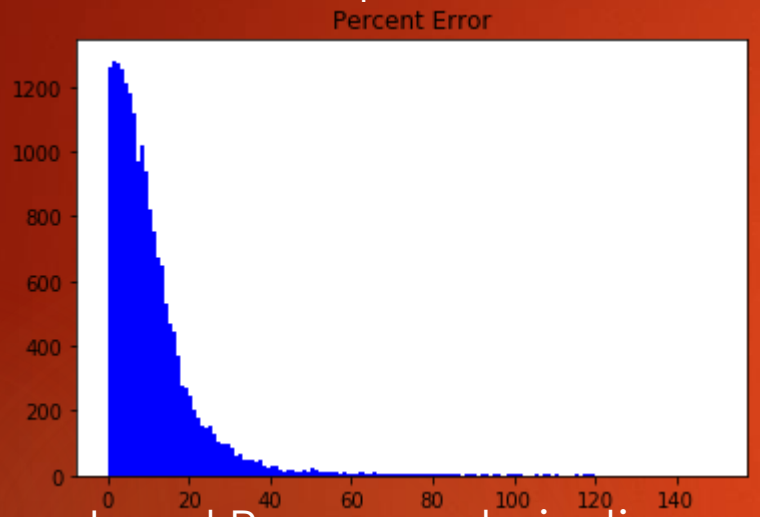


Summary

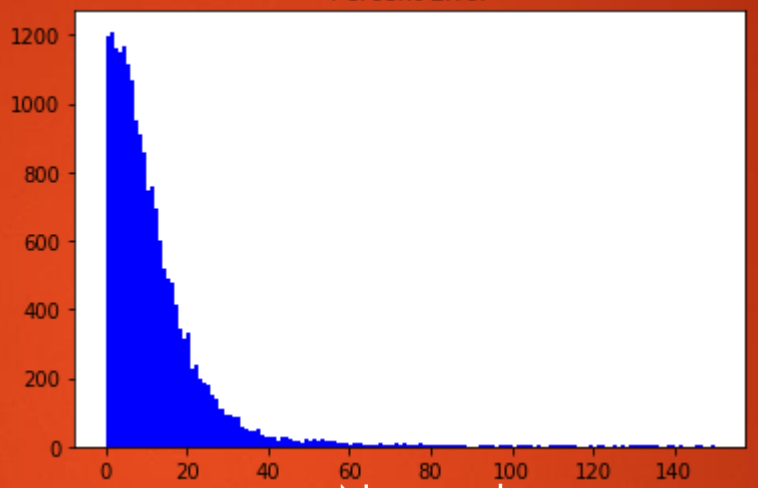
	Inside 1 SD	Inside 2 SDs	Inside 3 SD3	Outside of 3 SDs	Below min	Above max	Percent Error
Flipout Batched PRELU	25.59	48.12	65.86	34.17	9.01	22.04	11.40
Local Reparameterization Batched PRELU	11.96	23.86	34.90	65.10	42.05	20.27	12.24
Reparameterization Batched PRELU	39.31	67.16	83.00	17.00	5.02	9.65	13.21
Normal Dense PRELU	N/A	N/A	N/A	N/A	N/A	N/A	18.35
HMC RELU	29.88	53.92	70.13	29.88	19.69	15.35	10.56

General % Error

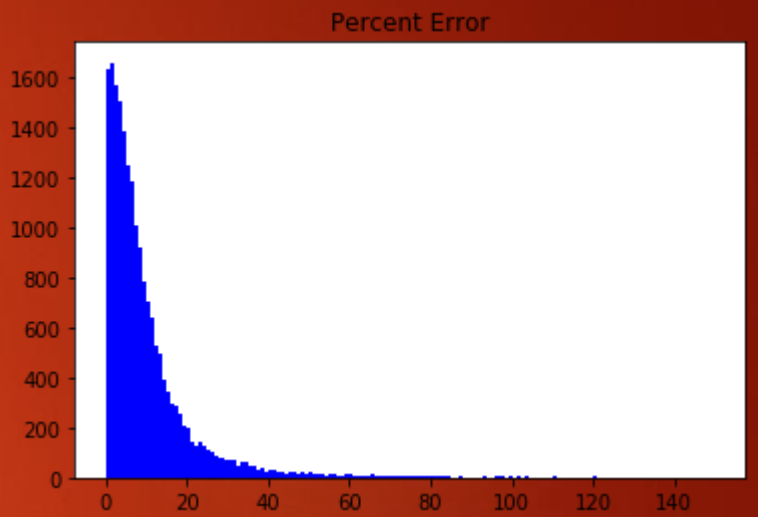
Flipout



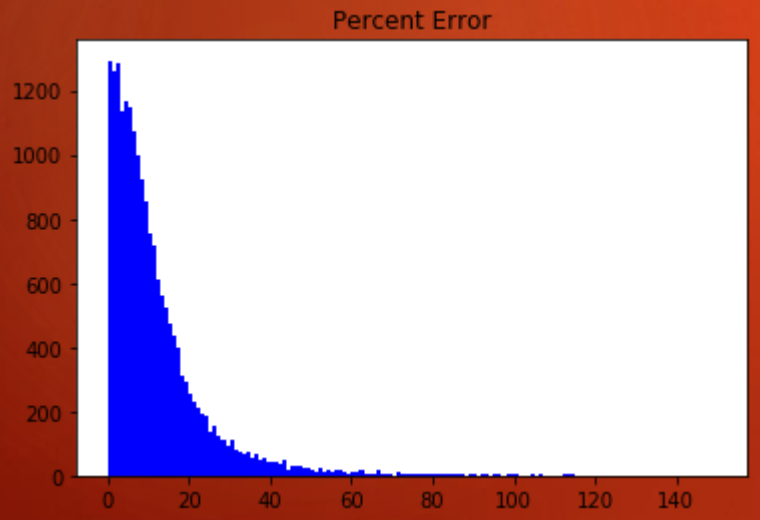
Reparameterization



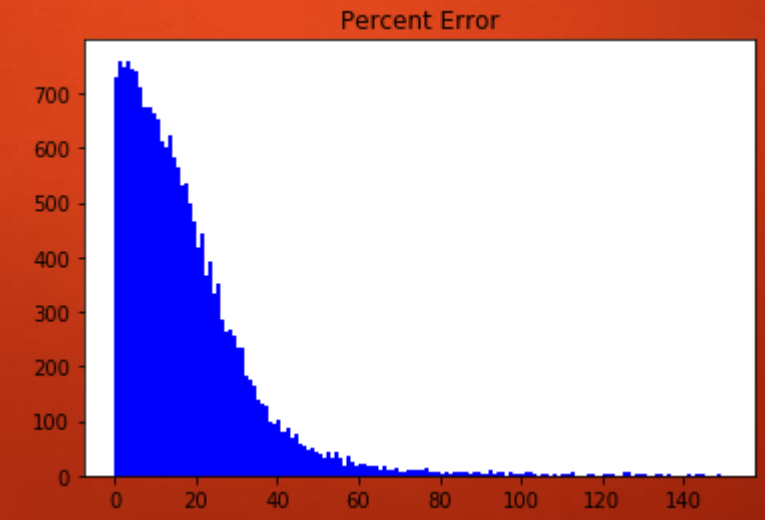
HMC



Local Reparameterization



Normal



Goals for next week

- Rewrite the prior update code so that it can be in the same sess.run command as the HMC updates
  - Currently this process is dramatically slowing down the training process and the slow down gets worse the longer the training runs
- Create a way to save all the networks created
- Add seeding for all random numbers