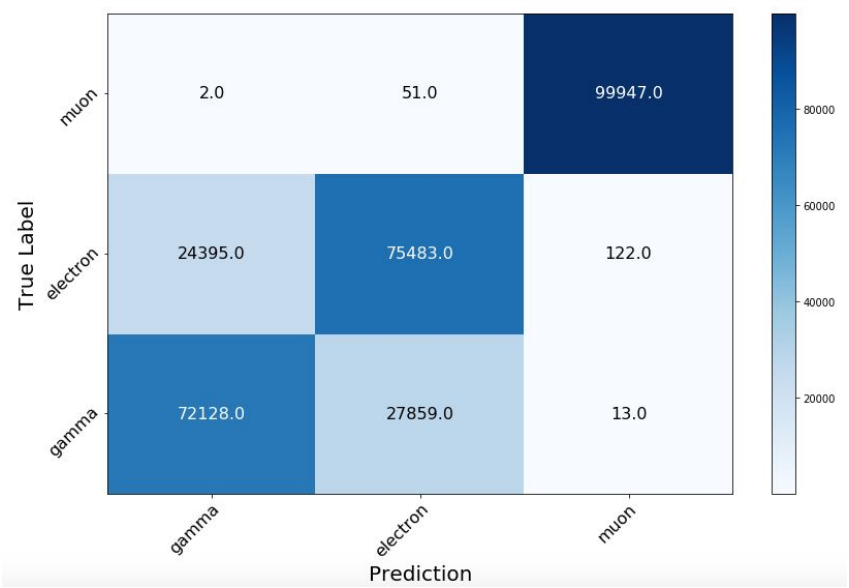
# WatChMaL - Group B

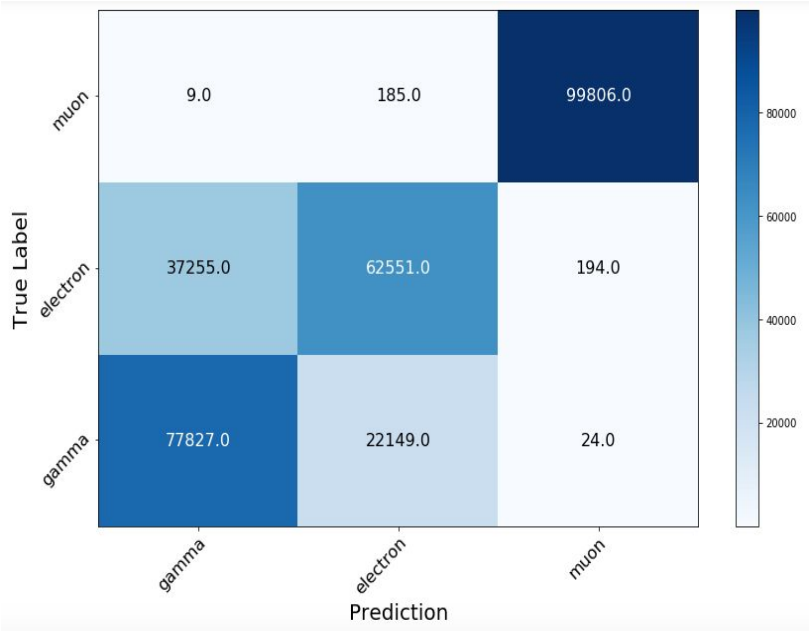
Victoria, B.C., 2019-April-17

# Original plan:

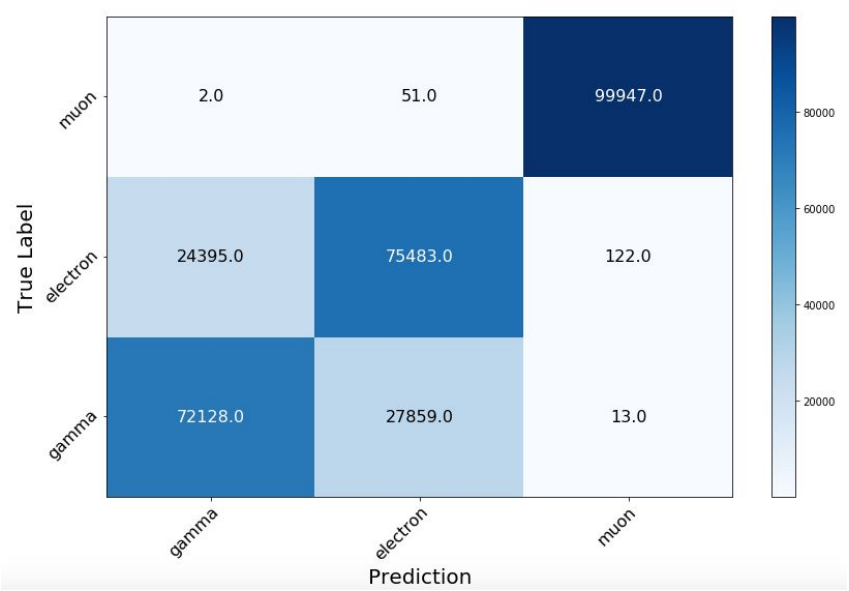
- Focus on e/gamma classification problem:
  - start with 'simple' data: simple grid, varying energy only
- Try tweaking LeNet architecture to see the differences in performance  V
- Try modern CNN architectures: survey what works best +-V
- Try visualizing kernels to check if we can get an intuition of 'what matters' to the network using LeNet X
- Evaluate performance as a function of energy +-V
- Try mPMT data V
- Try preprocessing X

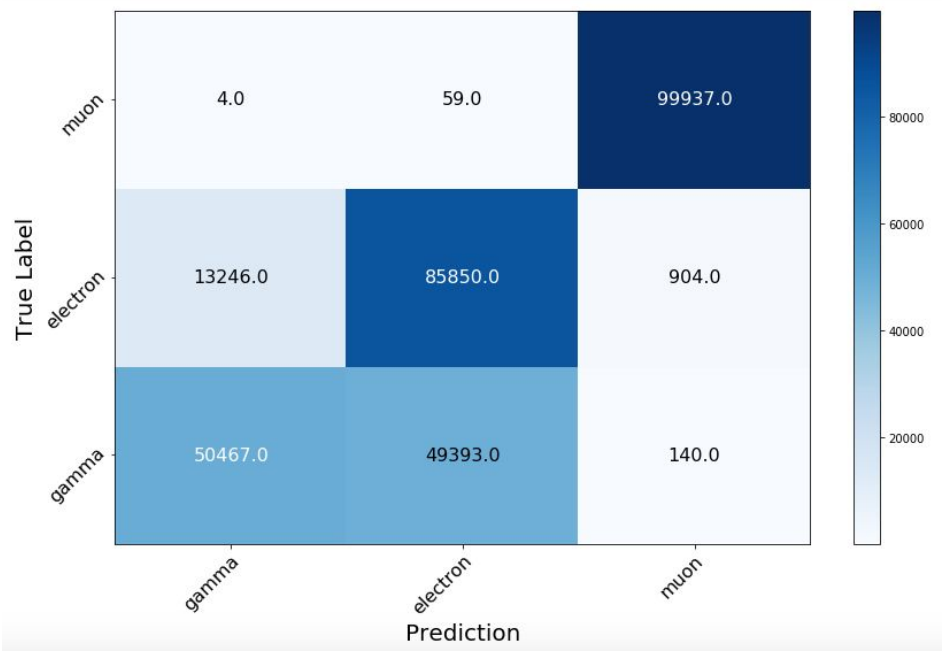
# Tweaking ~~LeKazuNet~~
# First kernel size: 3 (standard, left) and 5 (right)



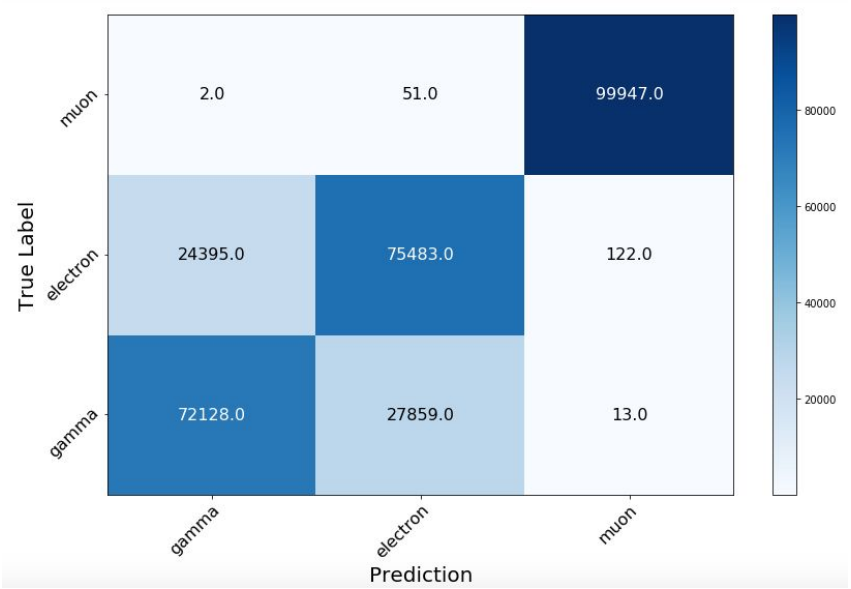



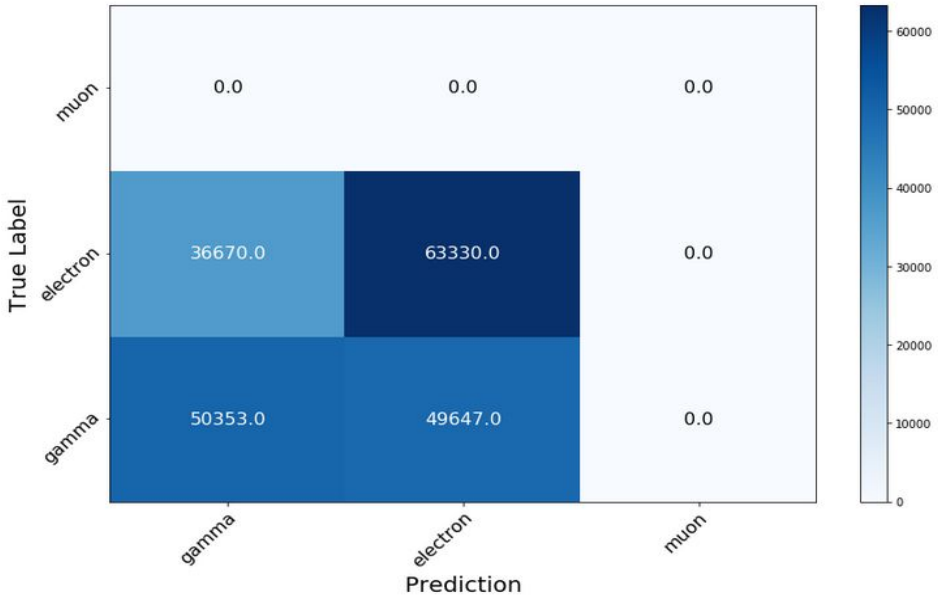
# Tweaking ~~LeKazuNet~~
# First batch size 256 (standard, left), 64 (right)



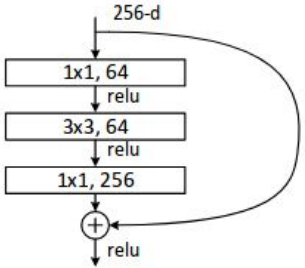
# Trained with e/mu/gamma, e/gamma only



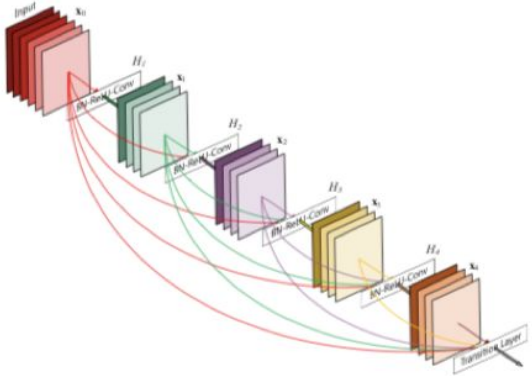



# ‘Modern’ CNN architectures

ResNet50:



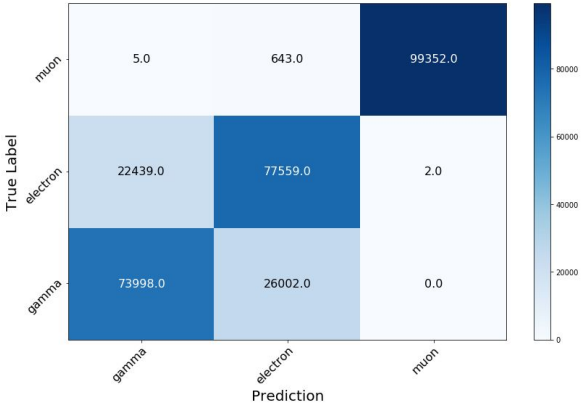

DenseNet121:



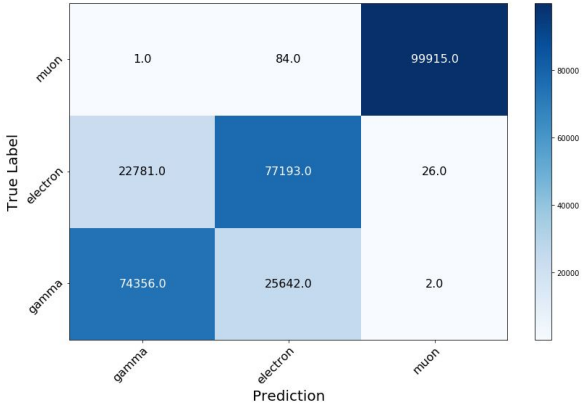
- Use ‘1M’ vary energy dataset .9 .1 .1 training validation testing split
- Use pytorch (torchvision) (unpretrained) implementation; tweaked RGB → two channel
- Poor man’s early stopping → save network with best loss on validation set
  - Stop when bored
- Results from test set (also above)

# Densenet Resnet confusion matrix

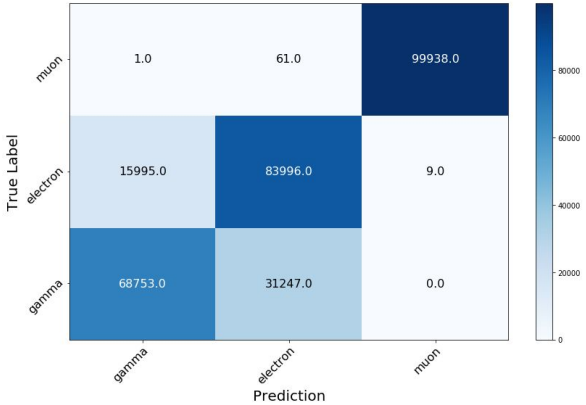
ResNet50
BS=64




DenseNet121 BS=256
(training unfinished)

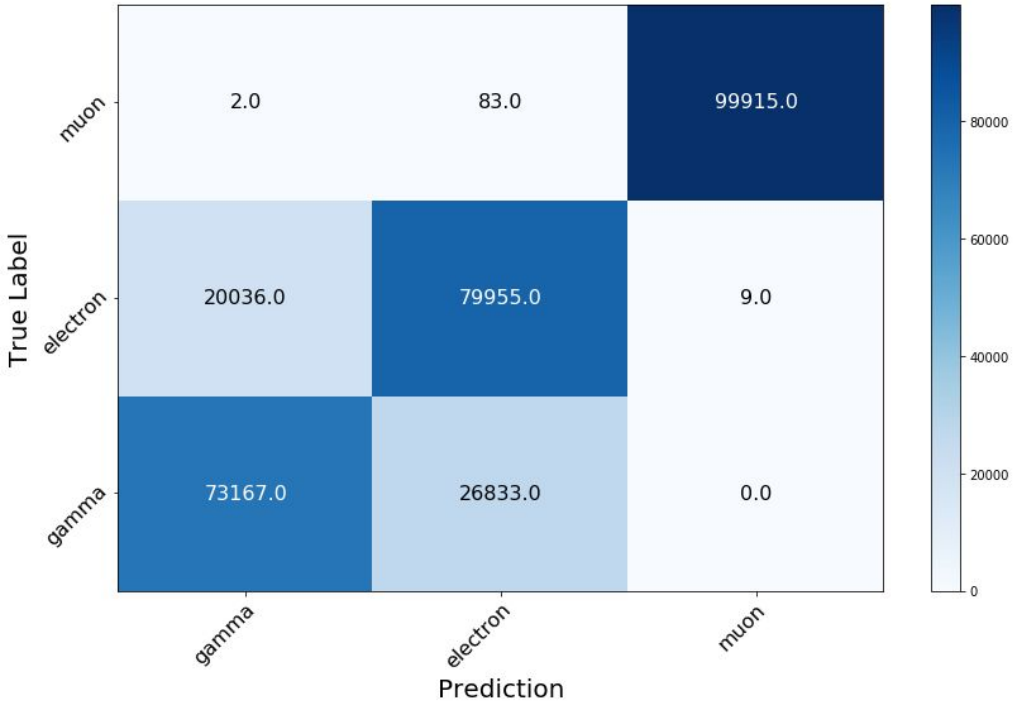



DenseNet121 BS=64



# Try mPMT

100k R=0 data DenseNet121 BS=64



# Performance as a function of Energy