Research Ideas

# Ideas for how to improve basic ResNet50 design

* ~~Reduce excess training data that trains in half of field we don’t test in.~~   
  FAILED: made it worse. Now the more it trains, the worse the test results get. This must be due to overfitting. Also error was jumping around a lot, perhaps due to a learning rate too high.
* Overfitting due to a low amount of training data:
  + Reduce amount of ResNet50 that is trainable.
    - ~~Tried none of ResNet50 trainable~~: was a very slow train over 600 iterations, and it looked like it was levelling out at 45cm error.
    - ~~Tried only Res5 trainable~~: Severely overtrained on the data. Test error dipped, then increased with more training up to 50cm error.
  + Introduce dropouts
* Use a better training Loss function.
* Report rotation error in degrees.
* Create unit tests for my functions
* Pre-train on the Places dataset.
* Pre-train on our own synthetic fish-eye dataset.
* Change base model.
* I need to come up with some way to augment the images I have.
  + Undistort the fish eye image, and then reproject at the different angle?
  + Need some way to create artificial views that are a blend of two training points