

[Reducing Bias & Variance]

- Human - Level

Avoidable bias

- Training Error

Variance

- Dev Error

- Bigger Model

- Train longer, Better Opti. \rightarrow Adam, RMSprop...

- Hyperparameter Tuning

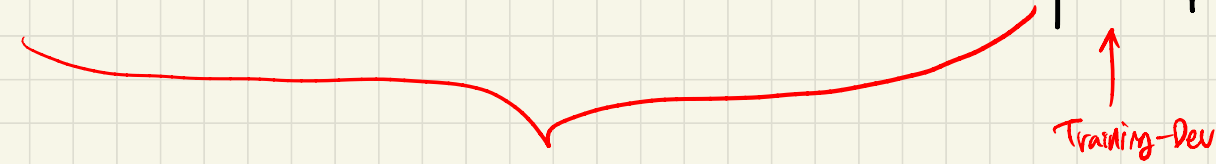
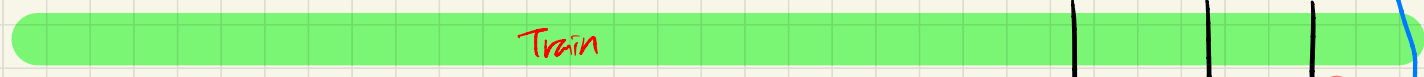
- More Data

- Regularization

- L2, dropout, augmentation

- Hyperparameter Tuning

10% 10% 10%
Dev Test



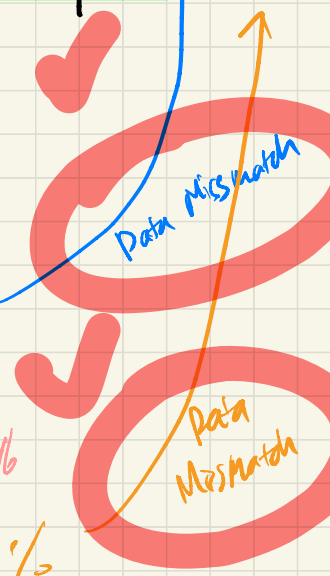
Training

1%

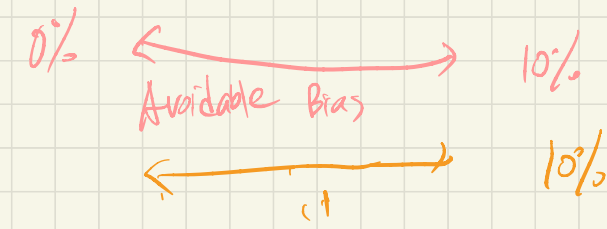
1%

error ↑
Variance

9%
1.5%



Human-Lv



11%
11%

20%

ex

Human level

Training

Training-Dev

Dev

Test

4%

7%

10%

12%

12%

) avoidable bias

) variance

) data mismatch

) degree of overfit