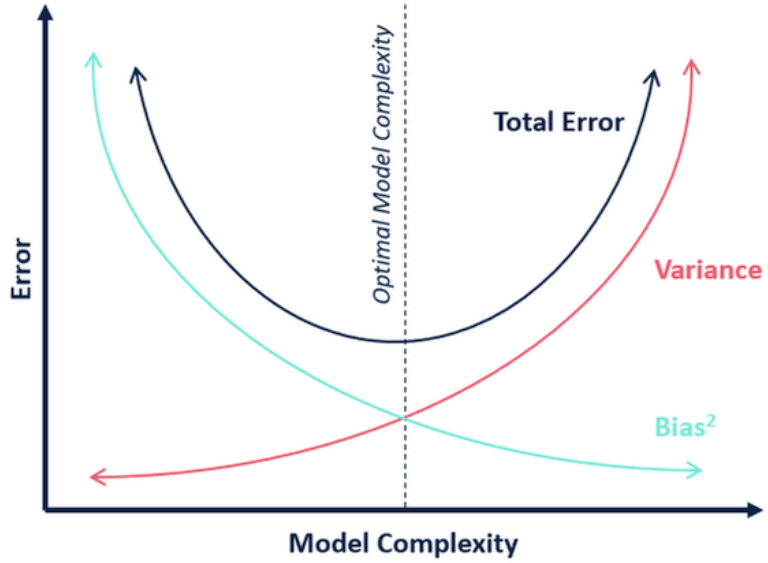
Siddhardhan

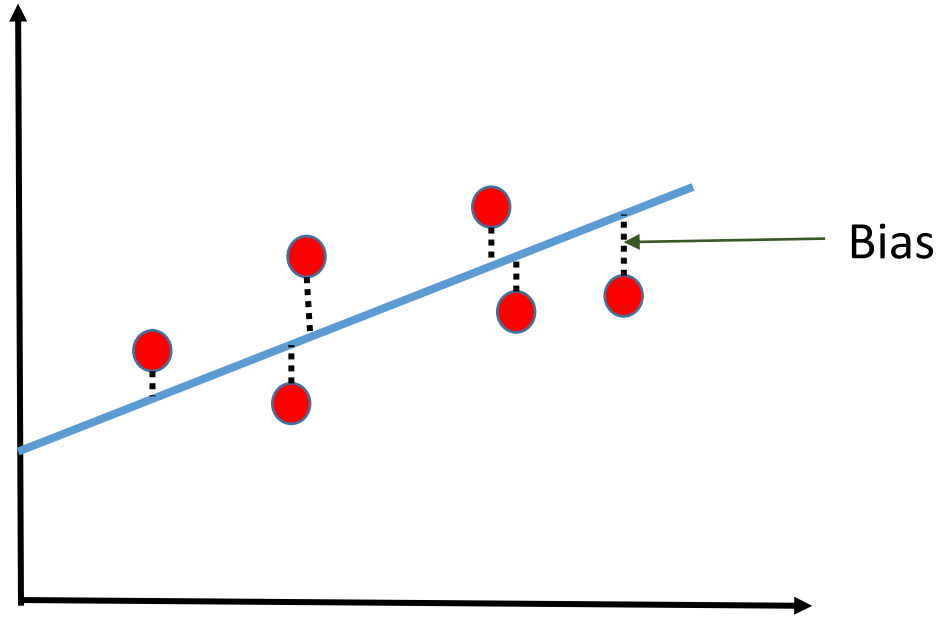
Bias – Variance Tradeoff in Machine Learning

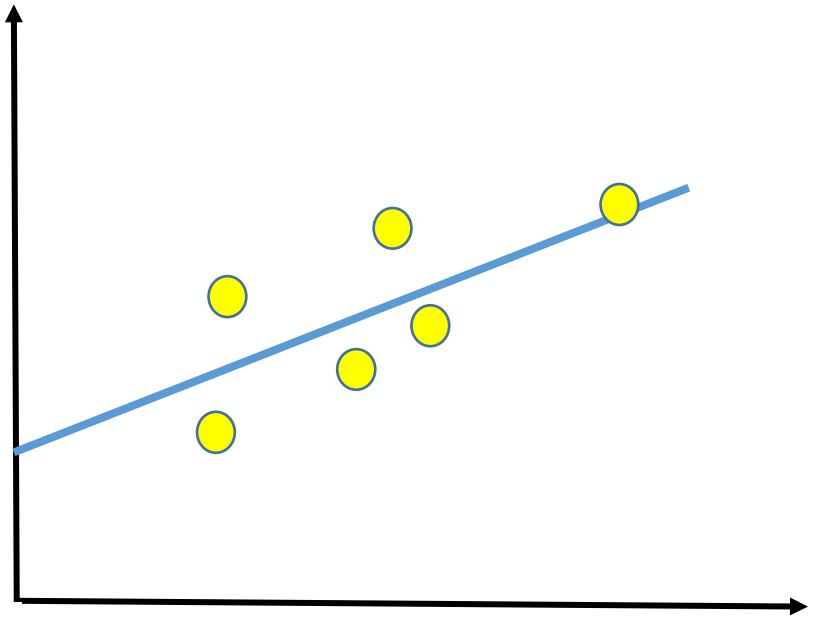


Bias – Variance Tradeoff

Bias :

Bias is the difference between the average prediction of our model and the correct value which we are trying to predict.

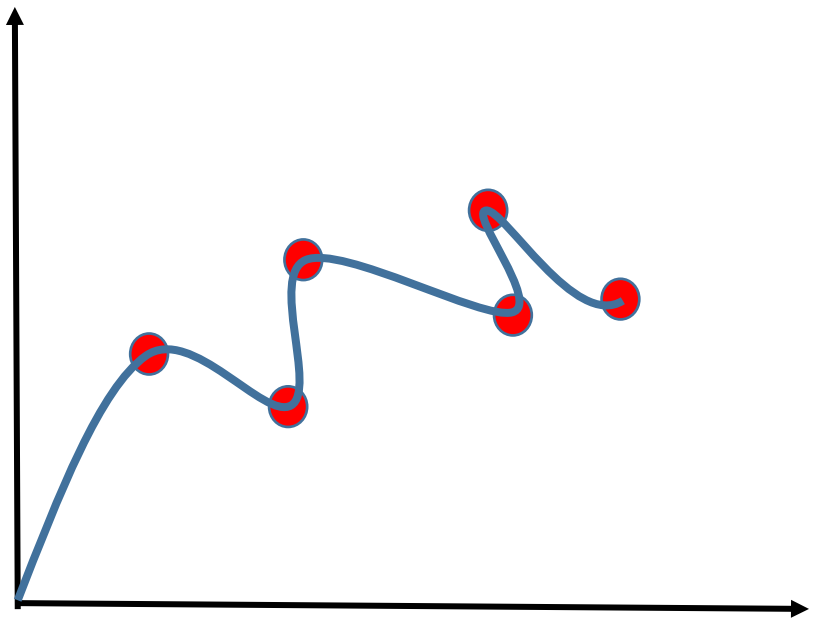




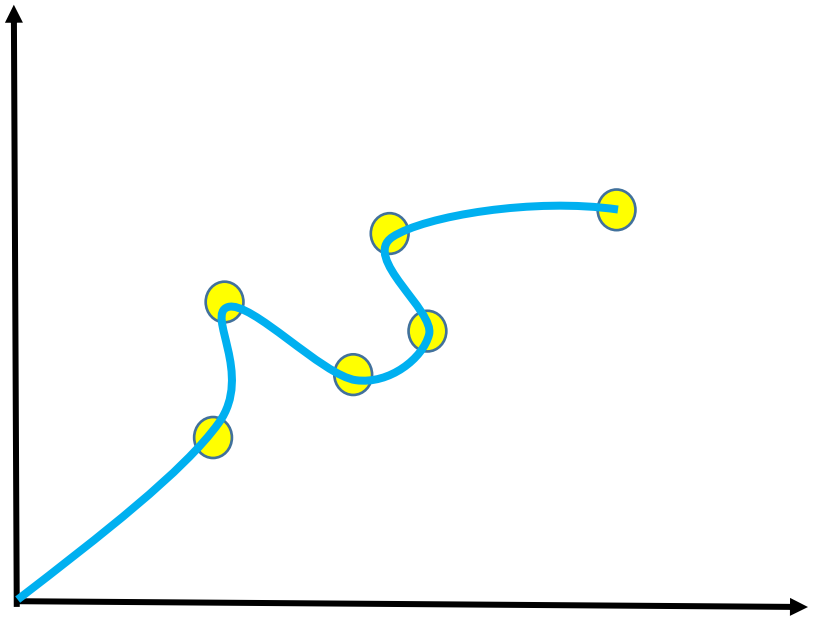
Bias – Variance Tradeoff

Variance :

Variance is the amount that the estimate of the target function will change if different training data was used.

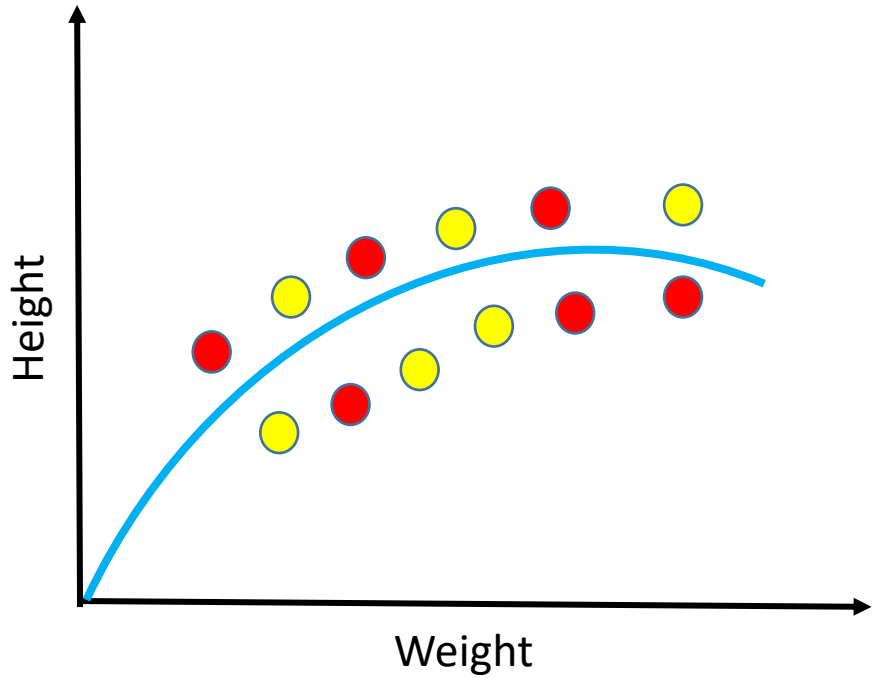


Bias = 0



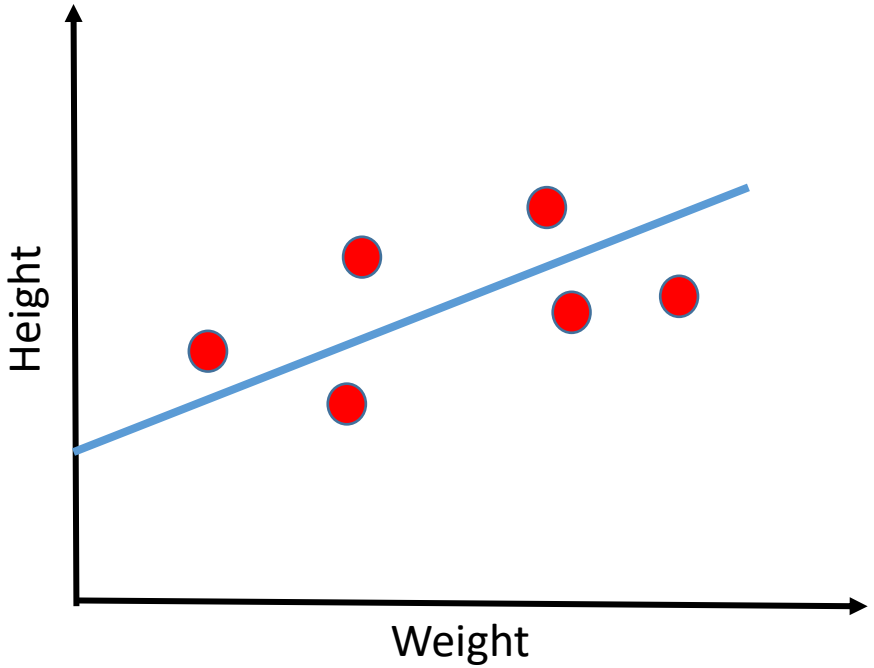
Bias – Variance Tradeoff

Problem statement: *Identify an appropriate model to predict the Height of a person, When their weight is given.*

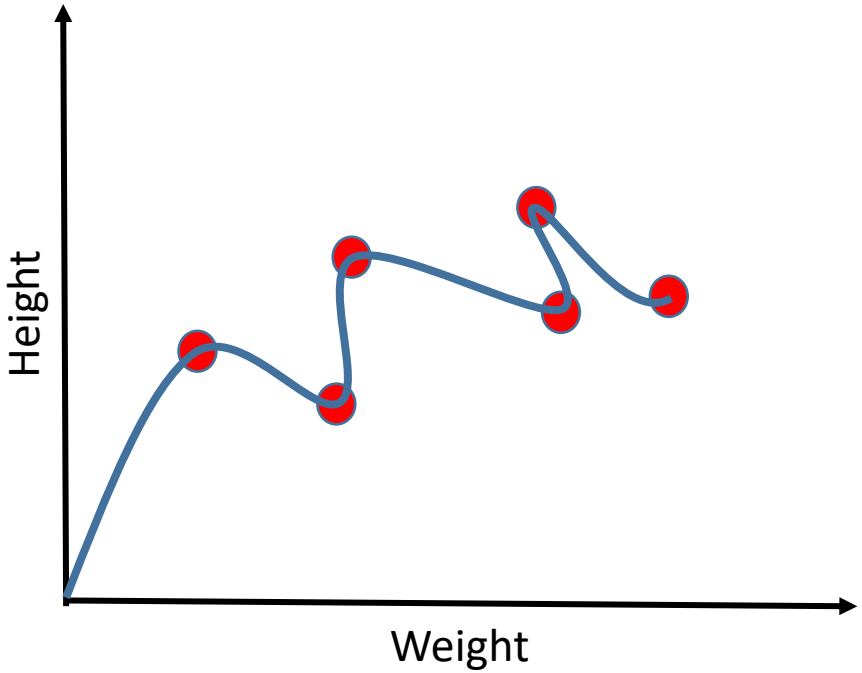


Underfitting & Overfitting

(Plot on training data)



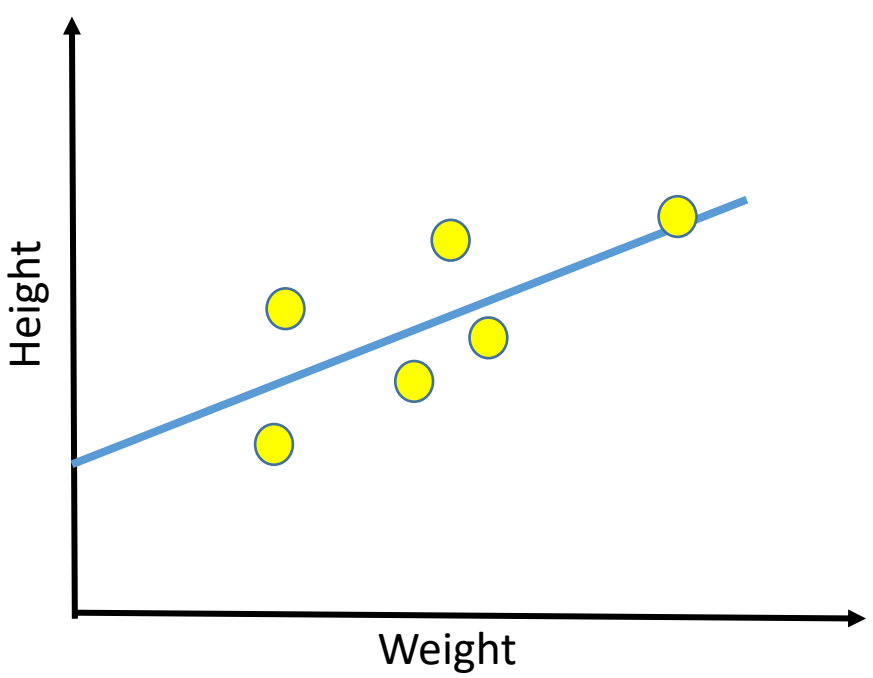
(i) Underfitting



(ii) Overfitting

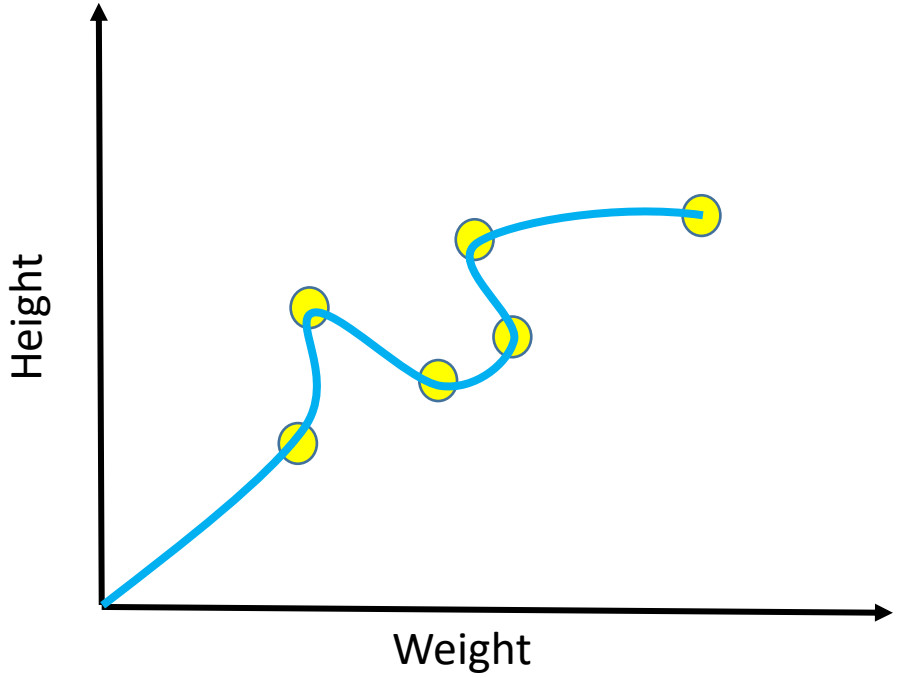
Bias – Variance Tradeoff

(Testing with different data)



(i) Underfitting

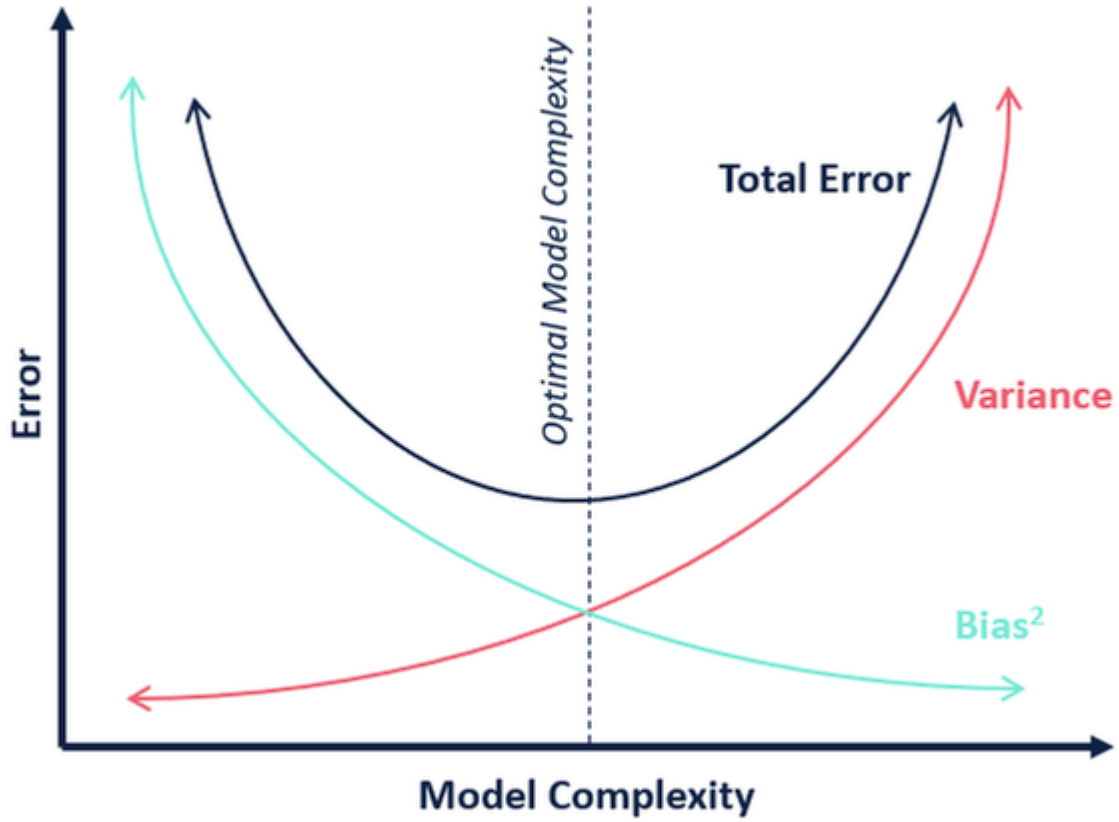
Inference:
a. *High Bias*
b. *Low Variance*



(ii) Overfitting

Inference:
a. *Low Bias*
b. *High Variance*

Bias – Variance Tradeoff



Bias – Variance Tradeoff

Techniques to have better Bias – Variance Tradeoff :

1. *Good Model Selection*
2. *Regularization*
3. *Dimensionality Reduction*
4. *Ensemble methods*