

Variance

7 min

✓ **Reading:** Diagnosing Bias vs. Variance  
3 min

✓ **Video:** Regularization and Bias/Variance  
11 min

✓ **Reading:** Regularization and Bias/Variance  
3 min

✓ **Video:** Learning Curves  
11 min

✓ **Reading:** Learning Curves  
3 min

## Diagnosing Bias vs. Variance

In this section we examine the relationship between the degree of the polynomial  $d$  and the underfitting or overfitting hypothesis.

- We need to distinguish whether **bias** or **variance** is the problem contributing to bad predictions.
- High bias is underfitting and high variance is overfitting. Ideally, we need to find a golden mean between these two.

The training error will tend to **decrease** as we increase the degree  $d$  of the polynomial.

At the same time, the cross validation error will tend to **decrease** as we increase  $d$  up to a point, and then it will **increase**, forming a convex curve.

