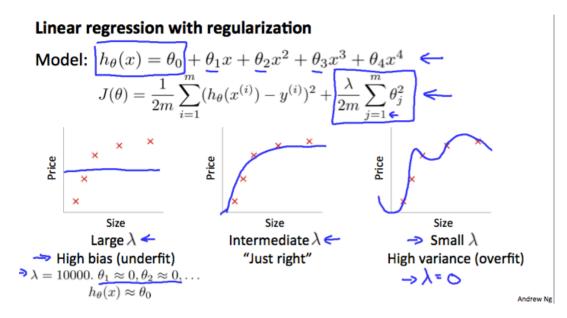
Regularization and Bias/Variance

Note: [The regularization term below and through out the video should be $\frac{\lambda}{2m}\sum_{j=1}^n \theta_j^2$ and **NOT** $\frac{\lambda}{2m}\sum_{j=1}^m \theta_j^2$]



In the figure above, we see that as λ increases, our fit becomes more rigid. On the other hand, as λ approaches 0, we tend to over overfit the data. So how do we choose our parameter λ to get it 'just right'? In order to choose the model and the regularization term λ , we need to:

- 1. Create a list of lambdas (i.e. $\lambda \in \{0,0.01,0.02,0.04,0.08,0.16,0.32,0.64,1.28,2.56,5.12,10.24\}$);
- 2. Create a set of models with different degrees or any other variants.
- 3. Iterate through the λ s and for each λ go through all the models to learn some Θ .
- 4. Compute the cross validation error using the learned Θ (computed with λ) on the $J_{CV}(\Theta)$ without regularization or λ = 0.
- 5. Select the best combo that produces the lowest error on the cross validation set.
- 6. Using the best combo Θ and λ , apply it on $J_{test}(\Theta)$ to see if it has a good generalization of the problem.

✓ Complete



