



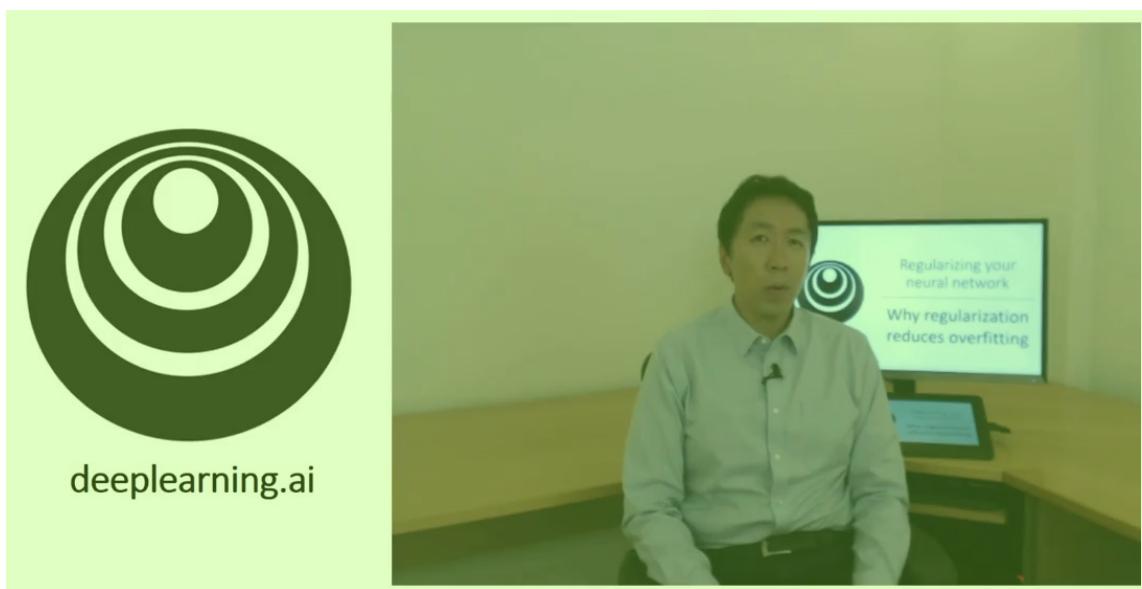
3

Regularizing your²
neural network

Why regularization⁴
reduces overfitting

↳

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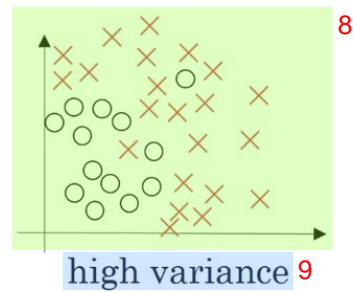
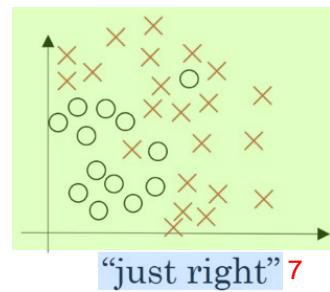
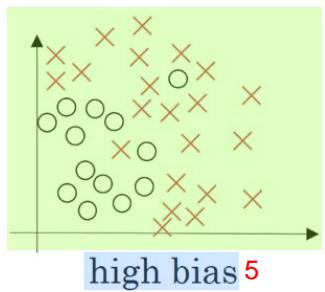
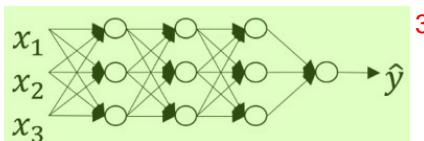
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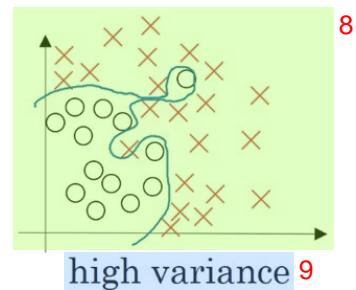
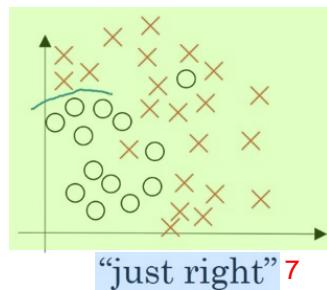
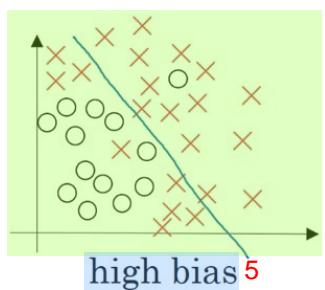
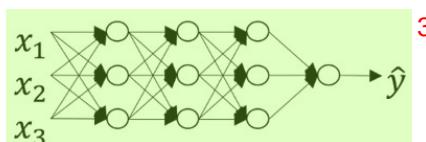
↳

How does regularization prevent overfitting?²



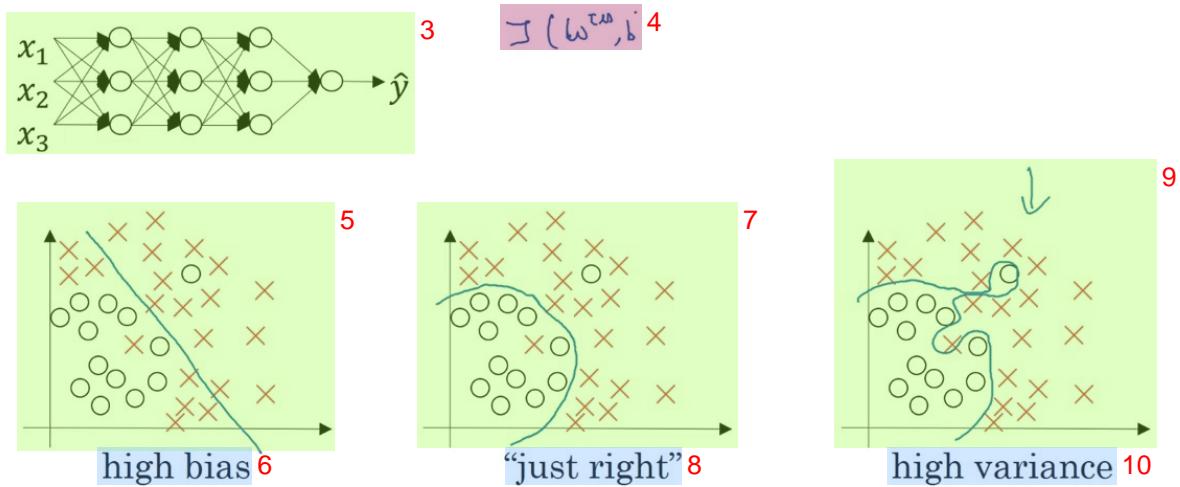
Andrew Ng 10

How does regularization prevent overfitting?²



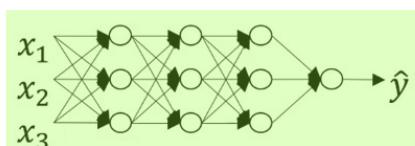
Andrew Ng 10

How does regularization prevent overfitting?²



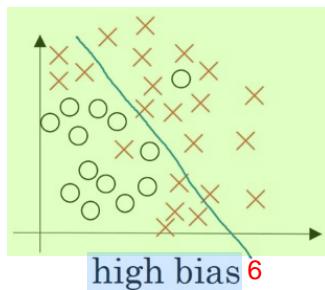
Andrew Ng 11

How does regularization prevent overfitting?²

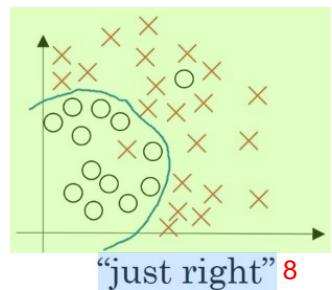


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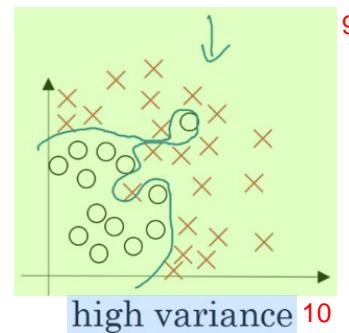
$$J(\omega^{(0)}, b^{(0)}) = \frac{1}{m} \sum_{i=1}^m L(y^{(i)}, \hat{y}^{(i)}) + \frac{\lambda}{2m} \sum_{l=1}^L \|\omega^{(l)}\|^2$$



5



7

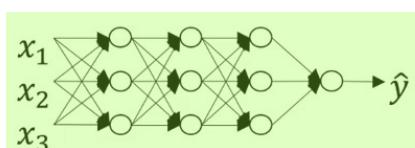


9

high variance 10

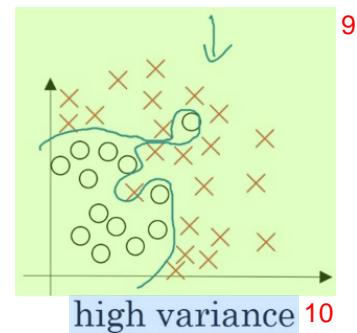
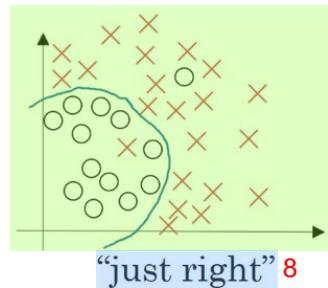
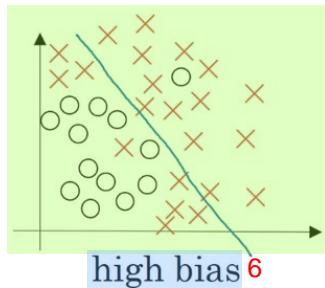
Andrew Ng 11

How does regularization prevent overfitting? ²



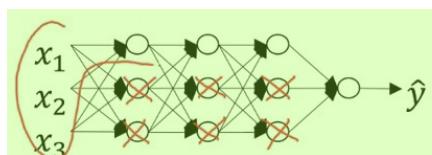
$$J(\omega^{(m)}, b^{(m)}) = \frac{1}{m} \sum_{i=1}^m L(y_i^{(i)}, \hat{y}_i^{(i)}) + \frac{\lambda}{2m} \sum_{l=1}^L \|\omega^{(l)}\|_F^2$$

4



Andrew Ng 11

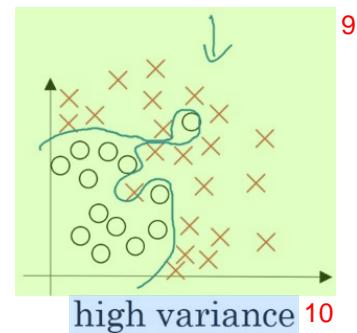
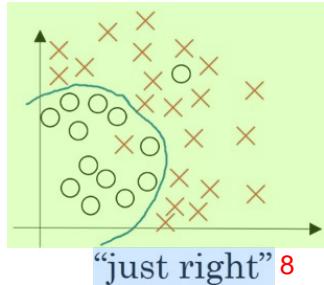
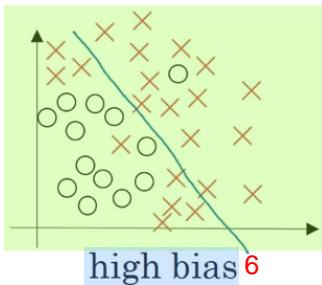
How does regularization prevent overfitting? ²



$$J(\omega^{(m)}, b^{(m)}) = \frac{1}{m} \sum_{i=1}^m L(y_i^{(i)}, \hat{y}_i^{(i)}) + \frac{\lambda}{2m} \sum_{l=1}^L \|\omega^{(l)}\|_F^2$$

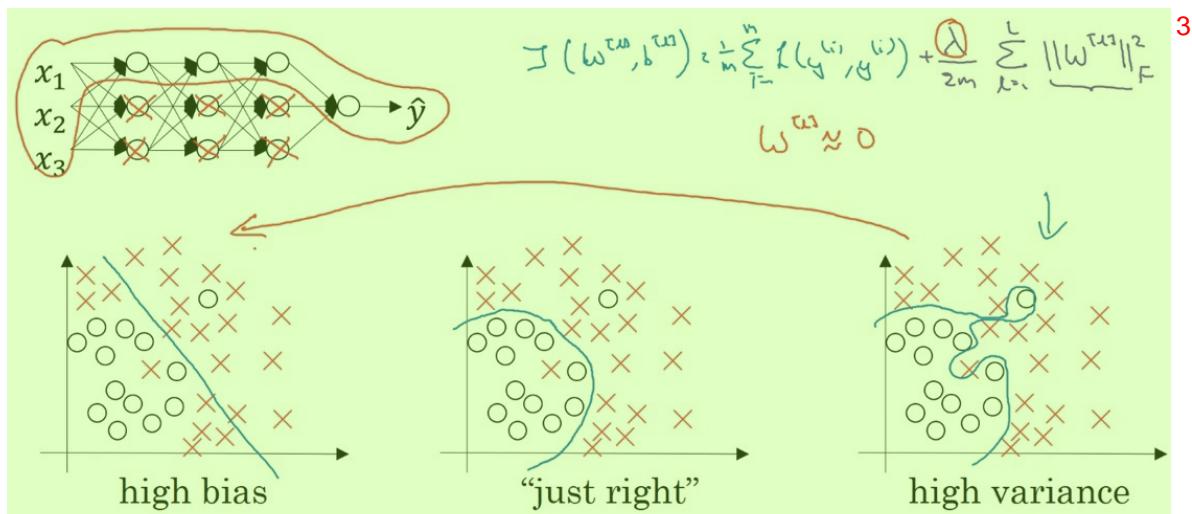
$\omega^{(l)} \approx 0$

4



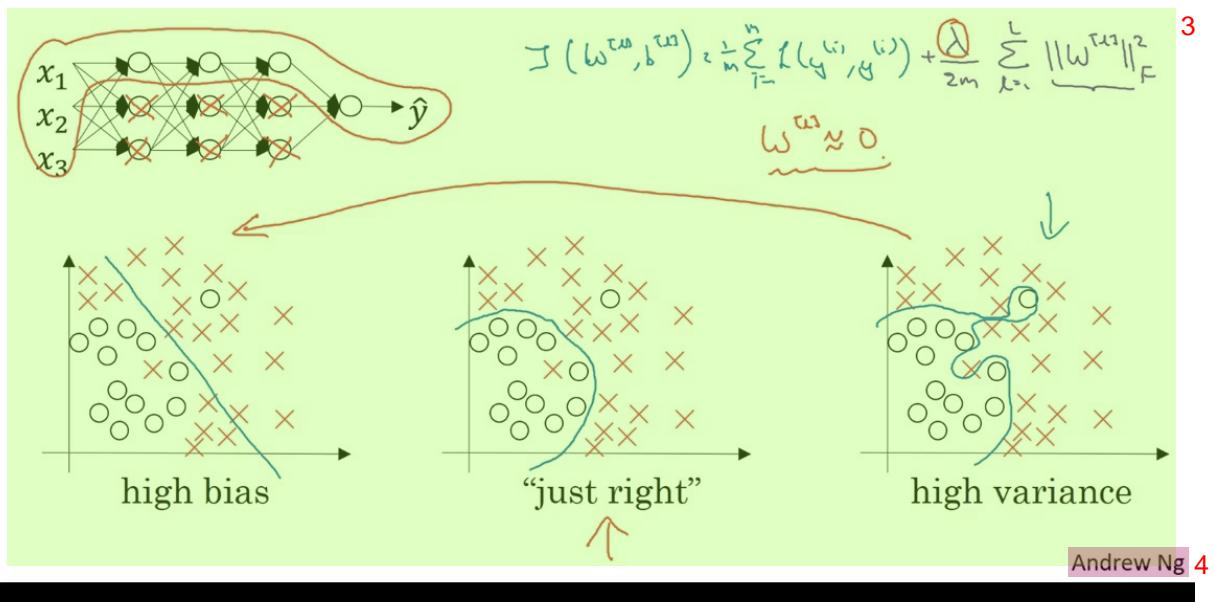
Andrew Ng 11

How does regularization prevent overfitting?²

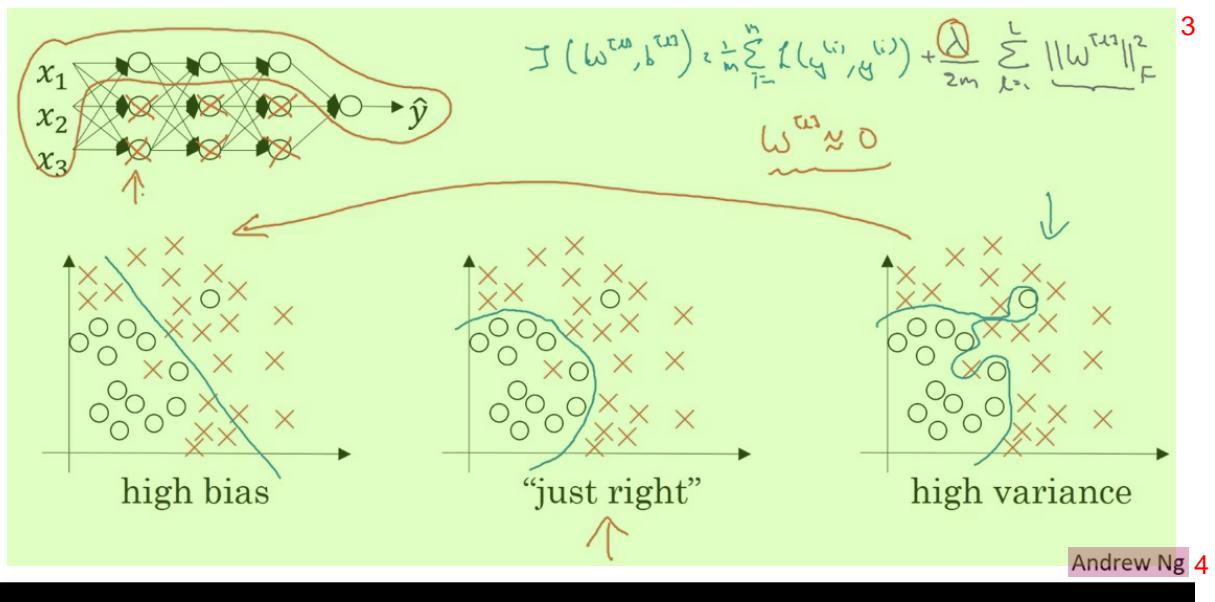


Andrew Ng 4

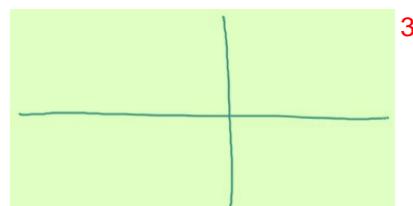
How does regularization prevent overfitting? ²



How does regularization prevent overfitting? ²



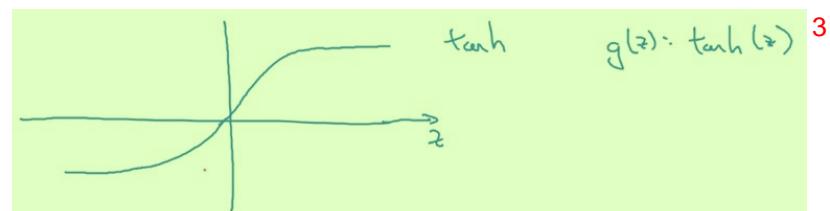
How does regularization prevent overfitting?²



3

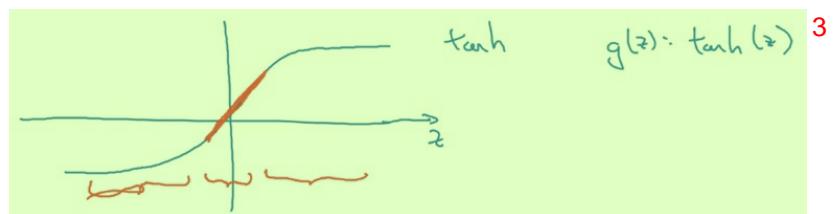
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How does regularization prevent overfitting?²



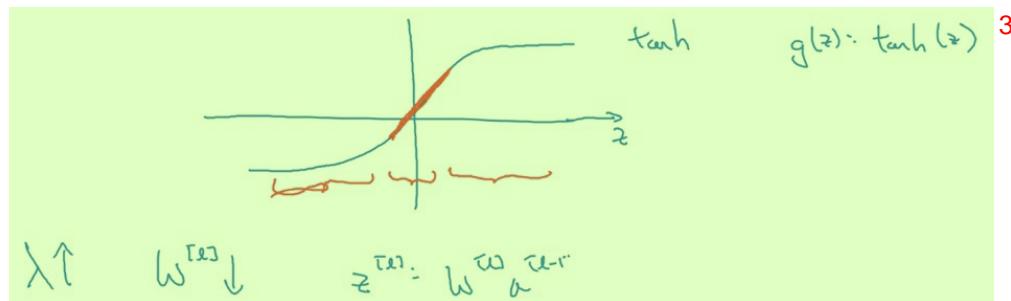
Andrew Ng

How does regularization prevent overfitting?²



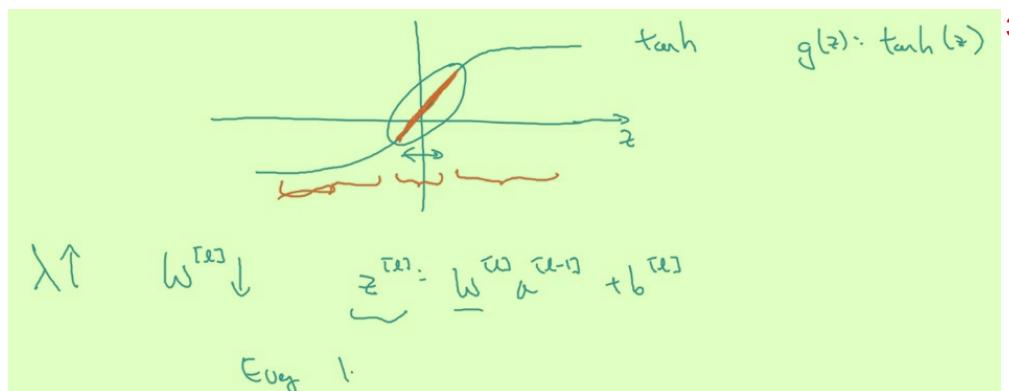
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How does regularization prevent overfitting? ²



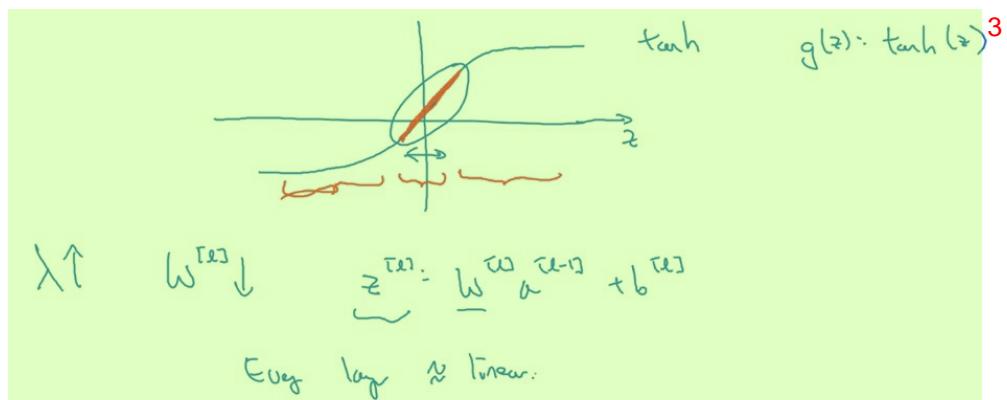
Andrew Ng

How does regularization prevent overfitting? ²



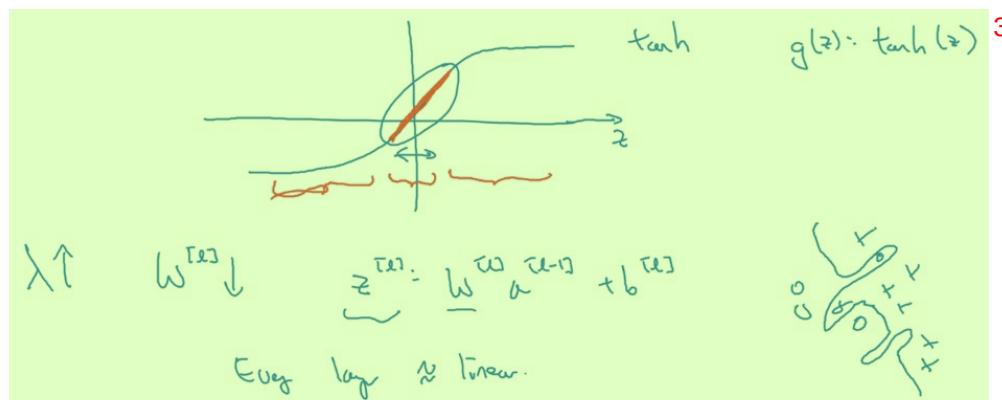
Andrew Ng

How does regularization prevent overfitting? ²



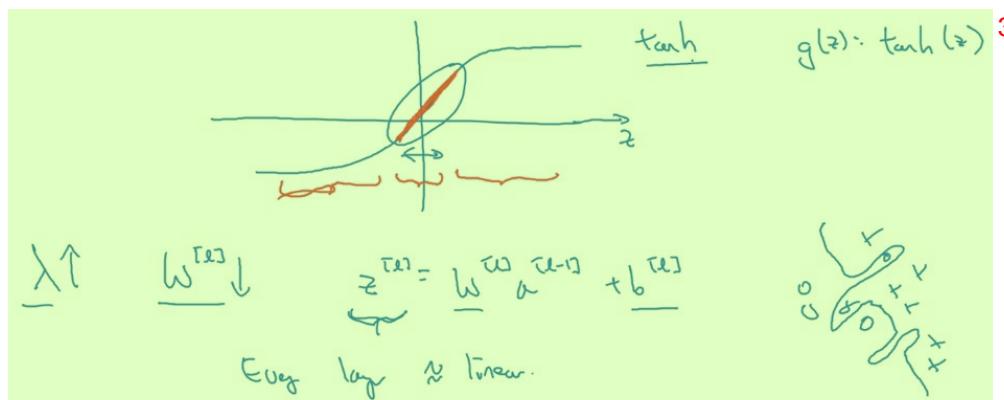
Andrew Ng

How does regularization prevent overfitting?²



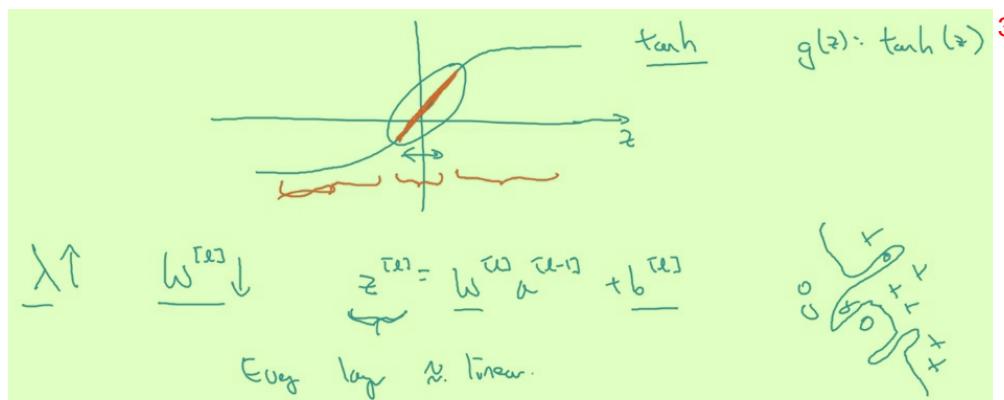
Andrew Ng

How does regularization prevent overfitting? ²



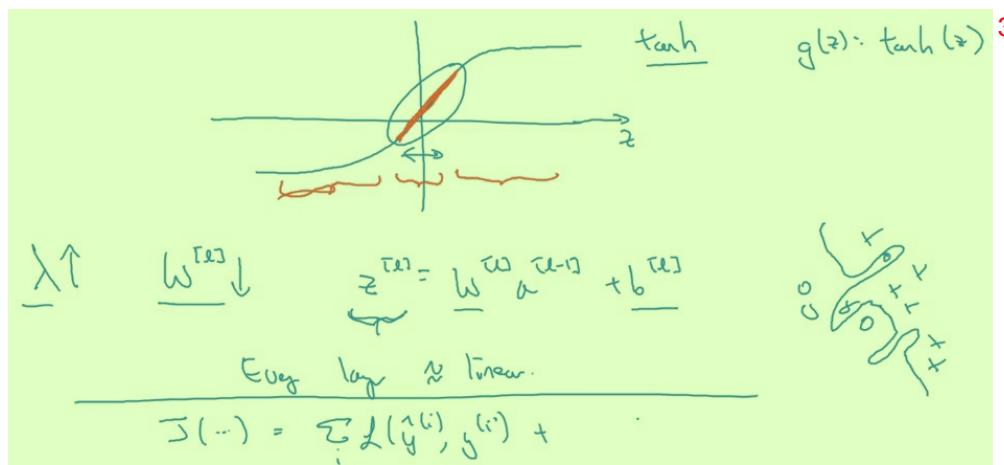
Andrew Ng

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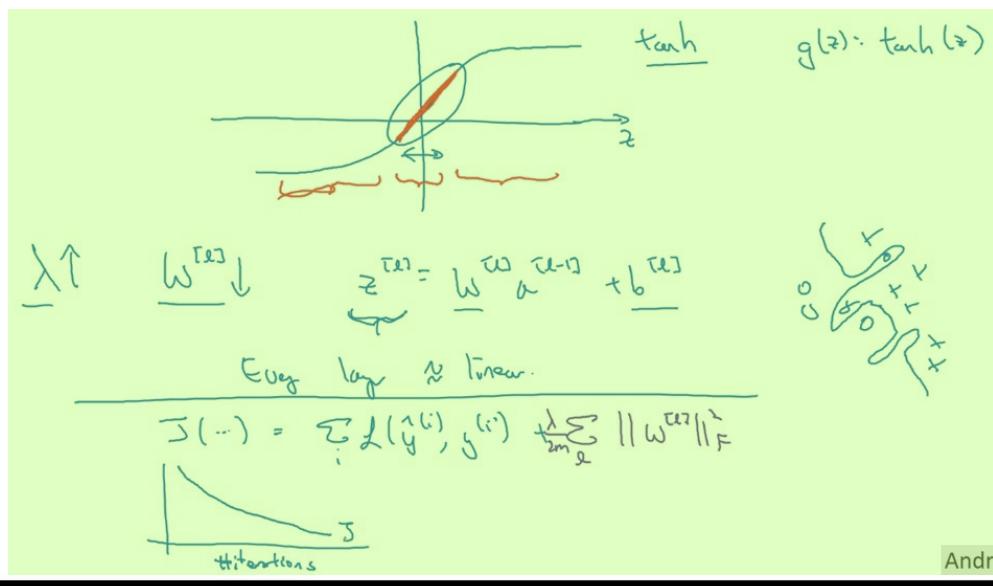
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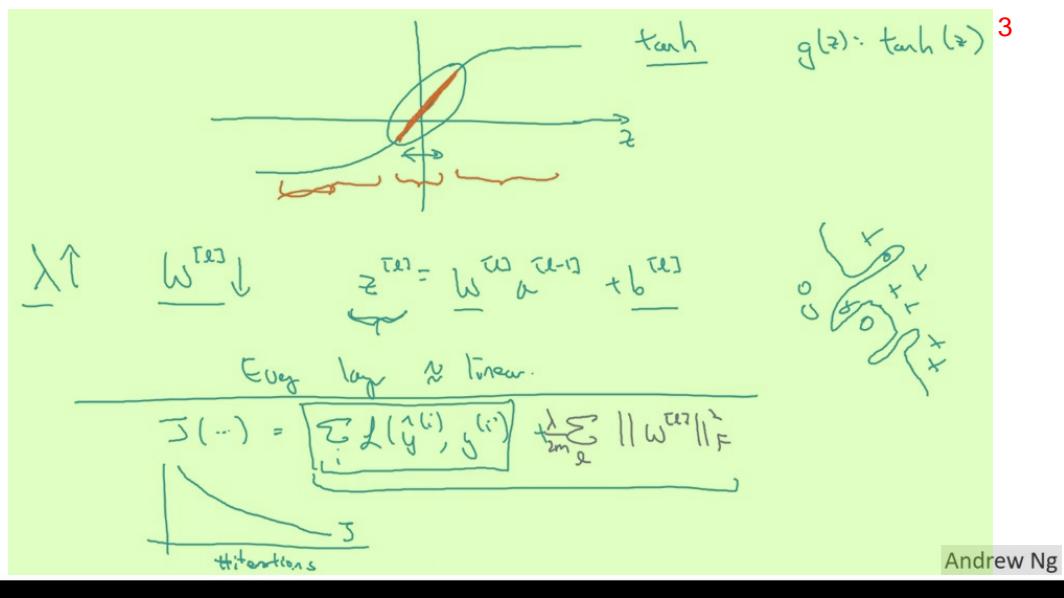


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How does regularization prevent overfitting? ²



How does regularization prevent overfitting? ²



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How does regularization prevent overfitting? 2 3 4 5



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