Machine and Deep Learning

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(06) Decision Trees
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(08) Convolutional Networks I
(09) Convolutional Networks II
(10) Recurrent Networks

Gradient Descent

(1) Calculate Gradient $\mathrm{d}\mathbf{W}$ (using **all** m training examples)

(2) Perform parameter update ("1 epoch")

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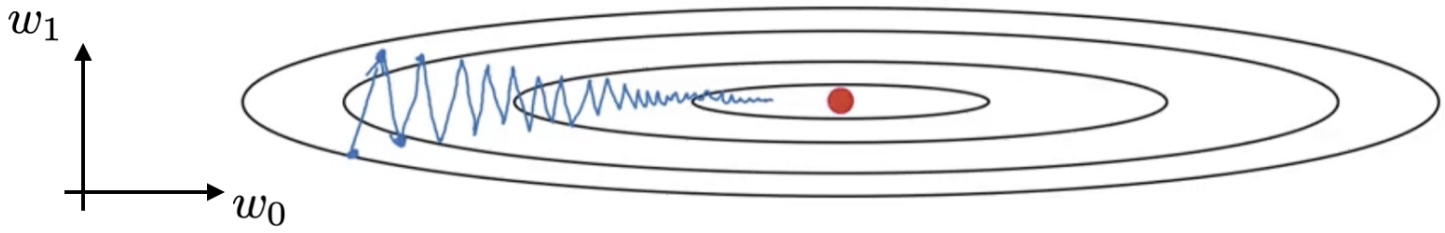
Batch Gradient Descent

For ech epoch:
Gradient descent step is performed for all m training example

RMSprop



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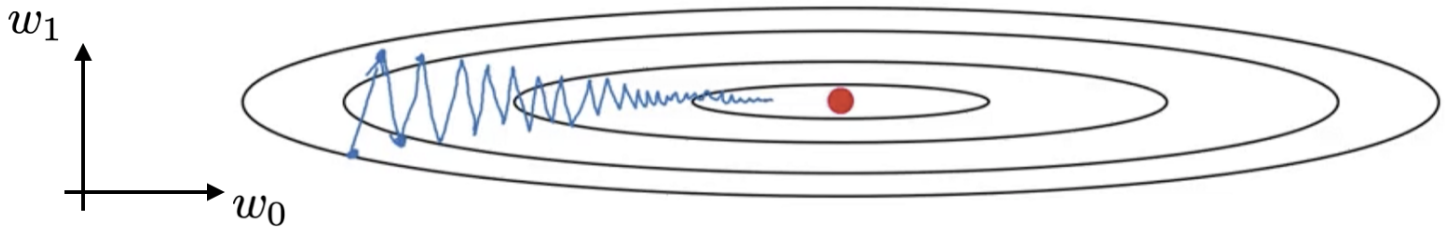

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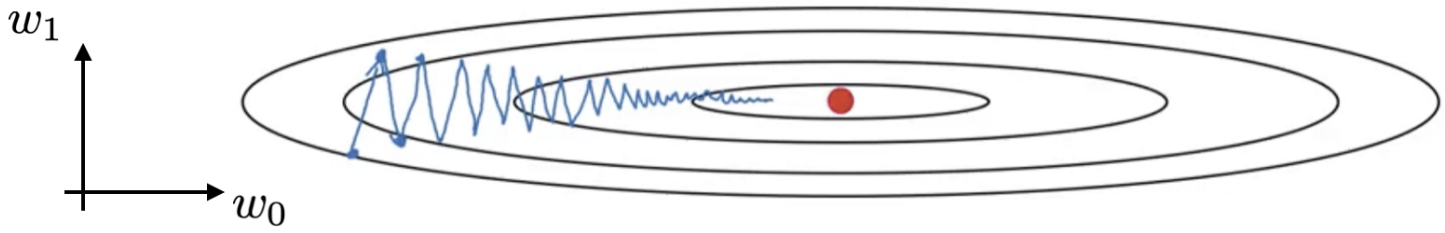

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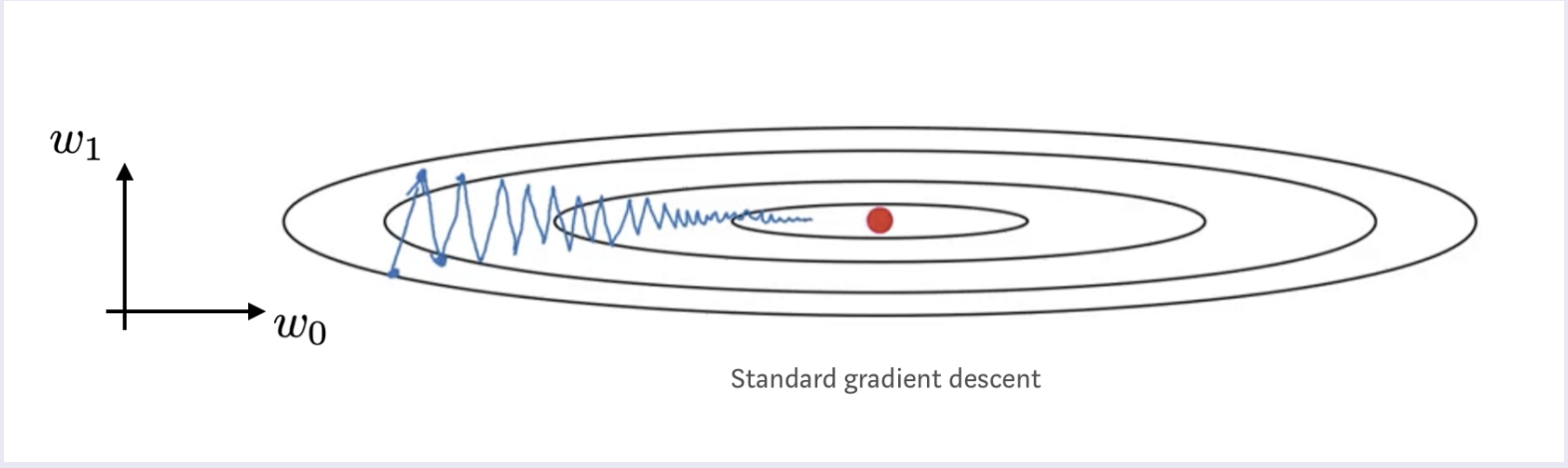

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Meaning of $S_{d\mathbf{W}}$: Exponentially weighted moving average of the squares of the weights dw^2.

K-fold Crossvalidation

IMDb Dataset - Binary Classification

Reviews of Movies (positiv/negativ).
Each review has to be cast into a One-Hot-Encoding representation.

Fashion MNIST - Multiclass Classification

Pictures of $K = 10$ classes of fashion items.
Rescale pictures from $[0, 255]$ to $[0, 1]$.

Boston Housing - Regression

Prices of Houses as a function of several features (average number of rooms, crime rate, access to highways ...).
Get read of mean and rescale features.
Very few examples $\rightarrow$ use K-fold crossvalidation

Boston Housing - Regression

Mean absolute error (MAE) of the Validation Set using K-fold validation with $K = 4$