deeplearning.ai

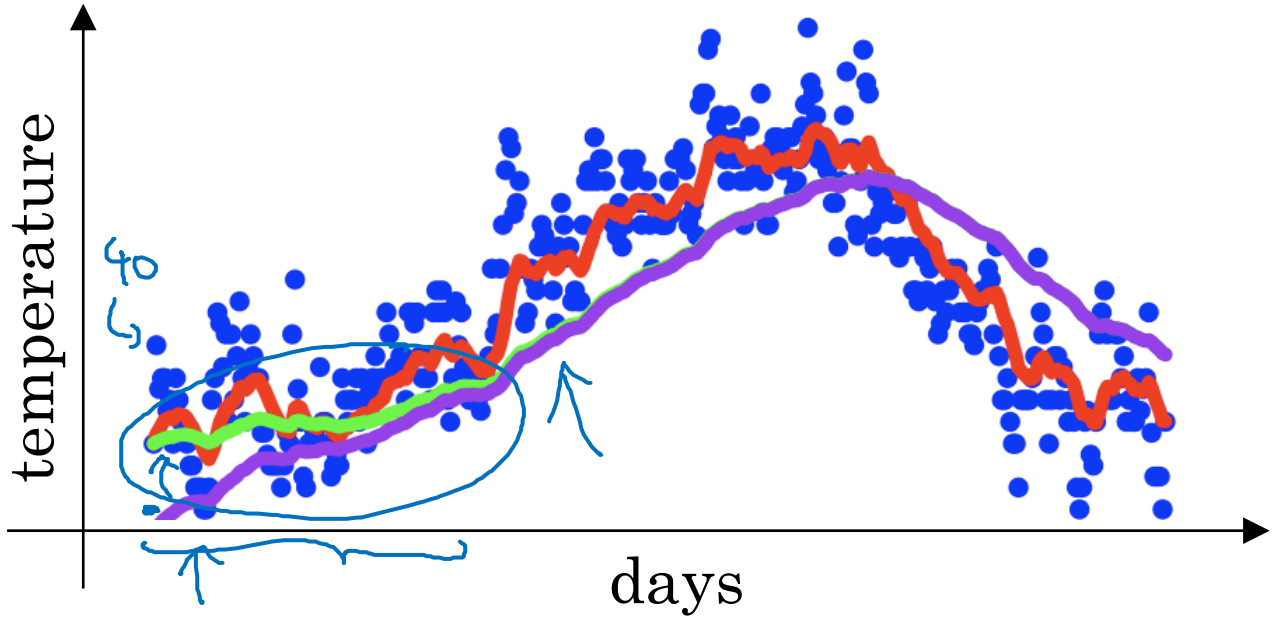
Optimization Algorithms

Bias correction in exponentially weighted average

That can make your computation of these averages more accurately

Bias correction

But if you are concerned about the bias during this initial phase, while your exponentially weighted moving average is still warming up, then bias correction can help you get a better estimate early on.



$\beta = 0.98$

$$v_t = \beta v_{t-1} + (1-\beta)\theta_t$$

$v_0 = 0$

$v_1 = 0.98 v_0 + 0.02 \theta_1$

$v_2 = 0.98 v_1 + 0.02 \theta_2$

$= 0.98 \times 0.02 \times \theta_1 + 0.02 \theta_2$

$= 0.0196 \theta_1 + 0.02 \theta_2$

$$\frac{v_t}{1-\beta^t}$$

$t=2: \quad 1-\beta^t = 1-(0.98)^2 = 0.0396$

$$\frac{v_2}{0.0396} = \frac{0.0196\theta_1 + 0.02\theta_2}{0.0396}$$

And so this becomes a weighted average of data 1 and data 2, and this removes the bias.

Andrew Ng