Module 5.7 : Tips for Adjusting learning Rate and Momentum

Before moving on to advanced optimization algorithms let us revisit the problem of learning rate in gradient descent

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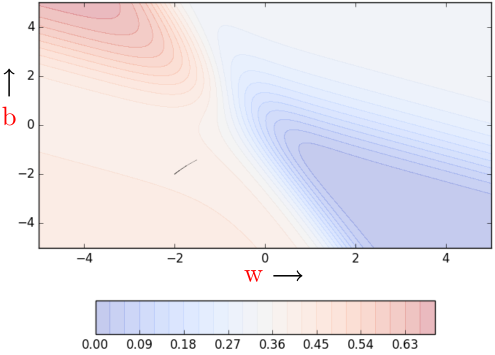

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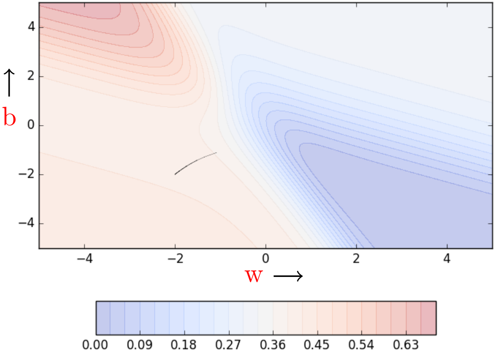

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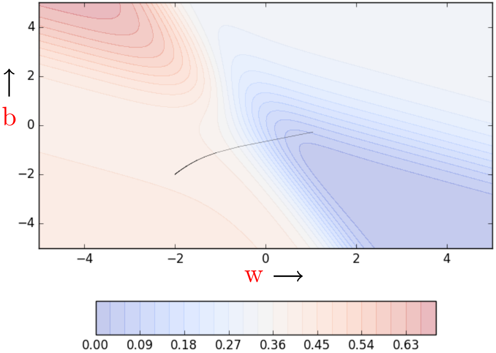

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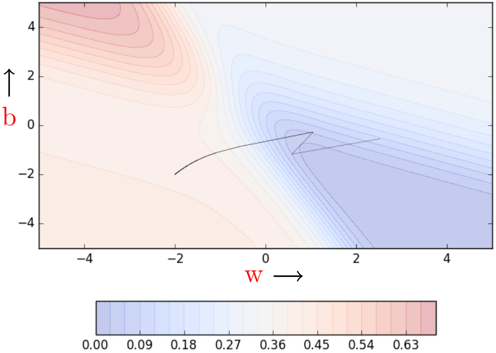

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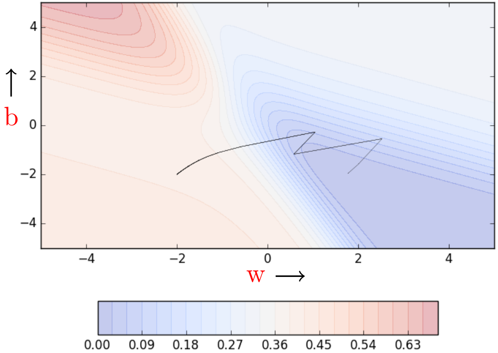

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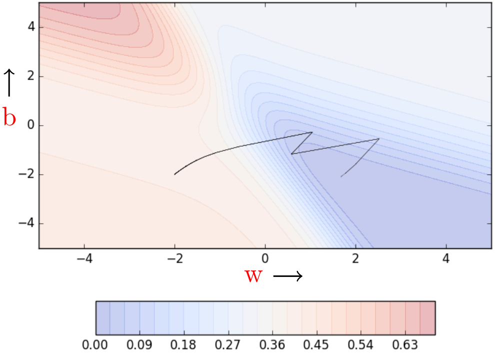

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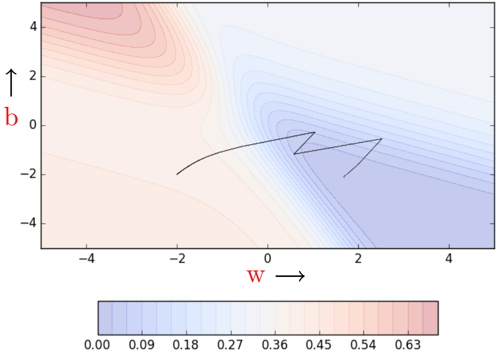

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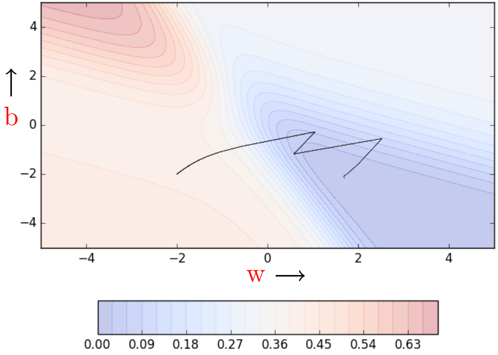

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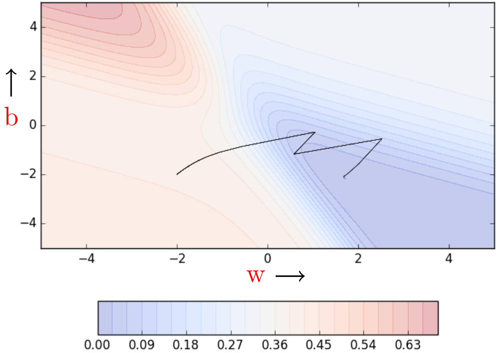

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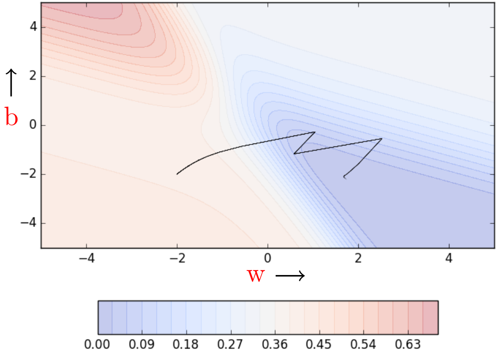

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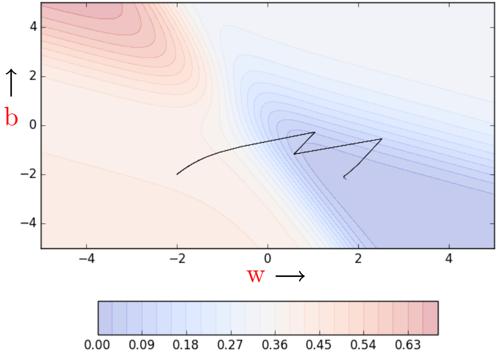

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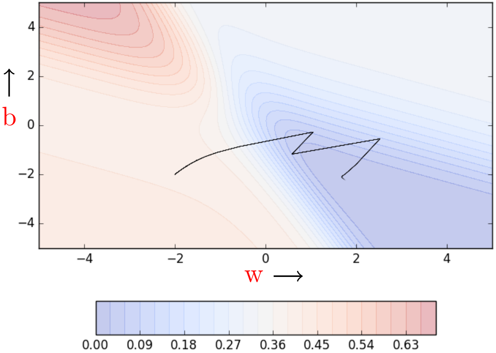

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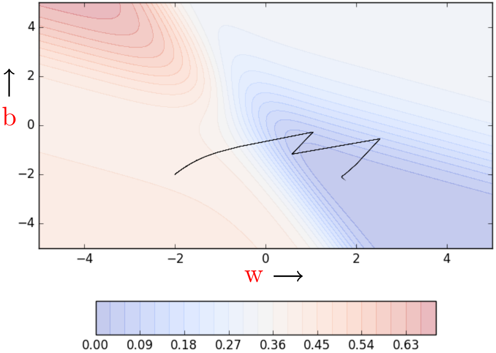

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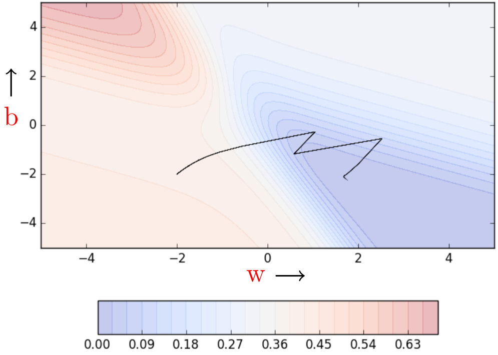

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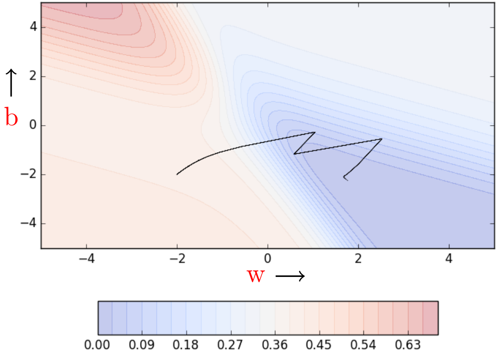

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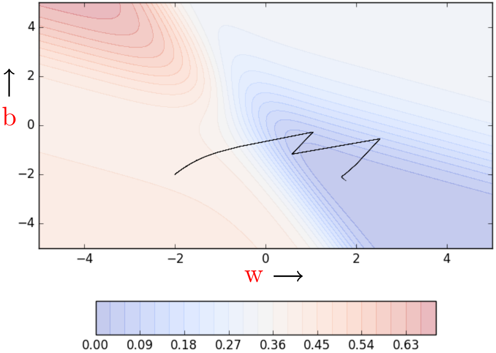

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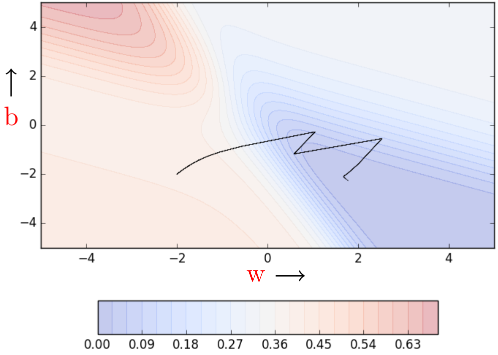

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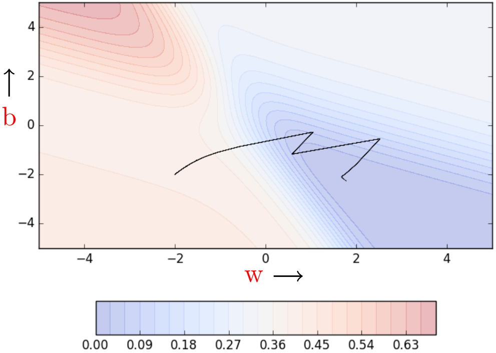

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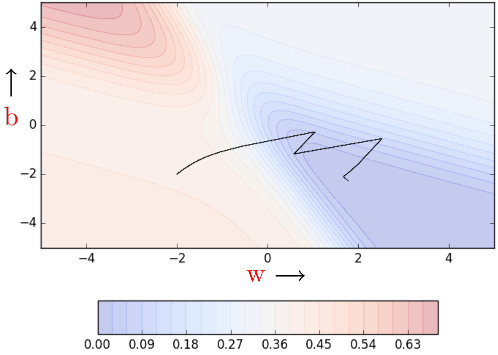

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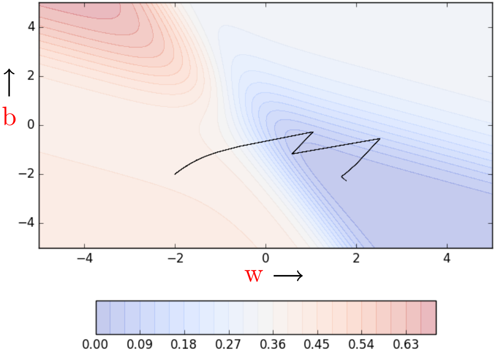

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- Disclaimer: these are just heuristics ... no clear winner strategy

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- **1/t Decay:** $\eta = \frac{\eta_0}{1+kt}$ where η_0 and k are hyperparameters and t is the step number

Tips for momentum

- The following schedule was suggested by Sutskever *et. al.*, 2013

$$\mu_t = min(1 - 2^{-1-log_2(\lfloor t/250 \rfloor + 1)}, \mu_{max})$$

where, μ_{max} was chosen from $\{0.999, 0.995, 0.99, 0.9, 0\}$