Machine Intelligence 2 - Exercise 9
Stochastic Optimization

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9.1 Simulated Annealing

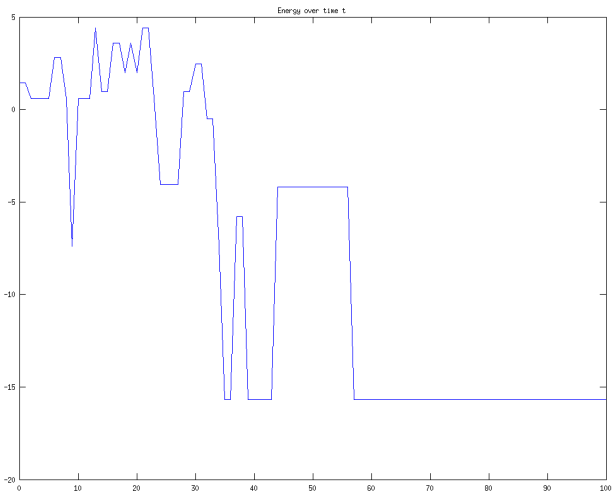

Figure 1: Energy with respect to time

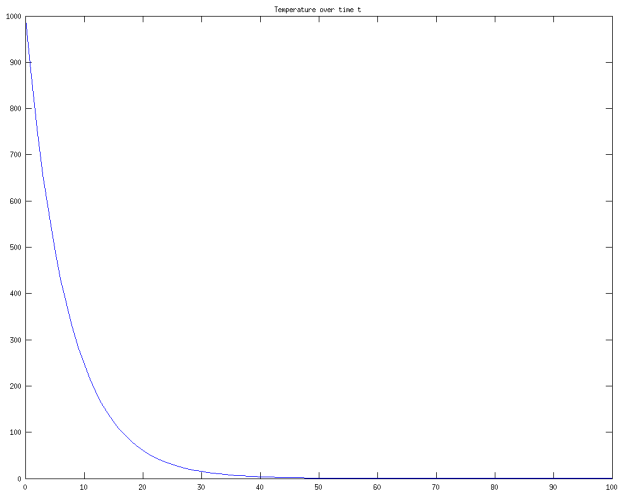

Figure 2: Temperature with respect to time

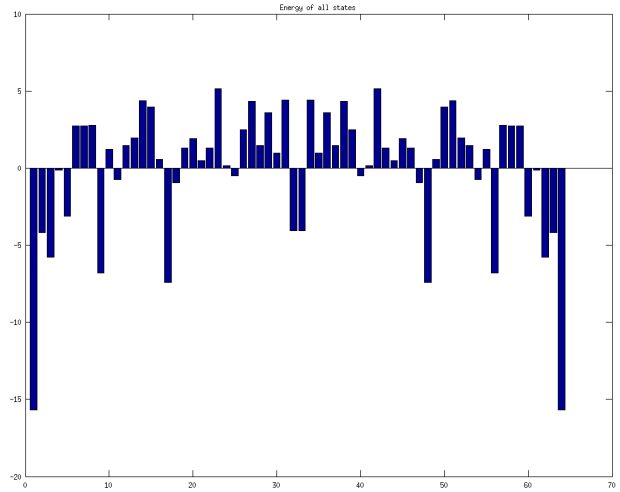

Figure 3: Energies over all states

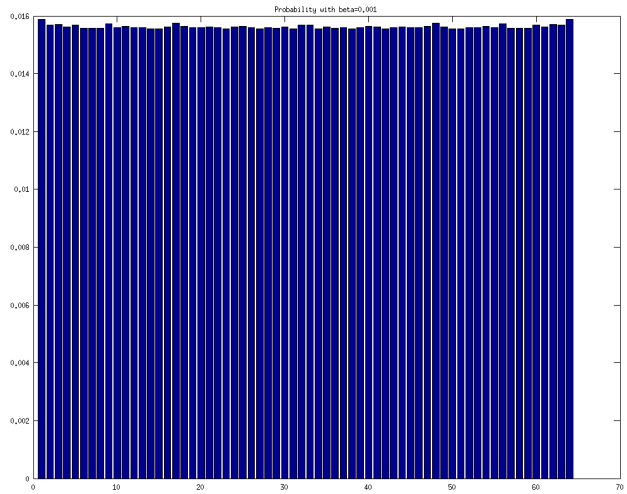

Figure 4: State probability with $\beta = 0.001$

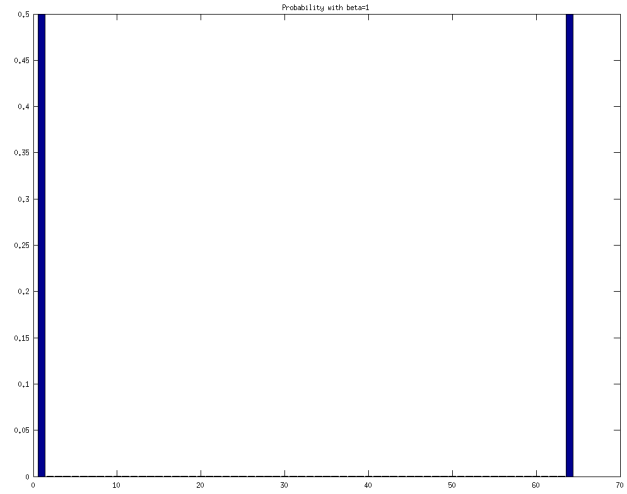

Figure 5: State probability with $\beta = 1$

9.2 Mean-Field Annealing

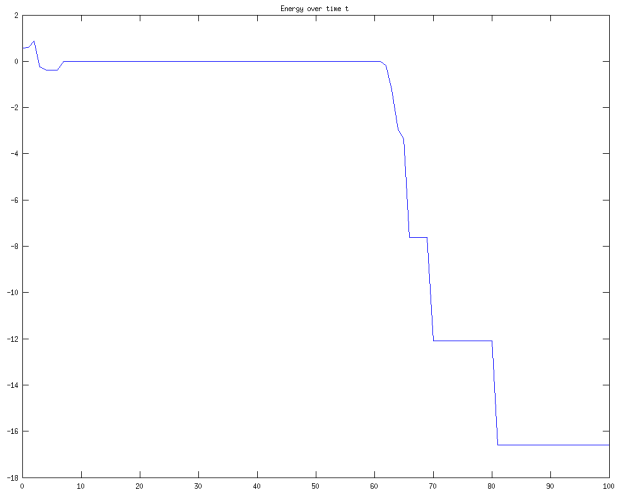

Figure 6: Energy with respect to time

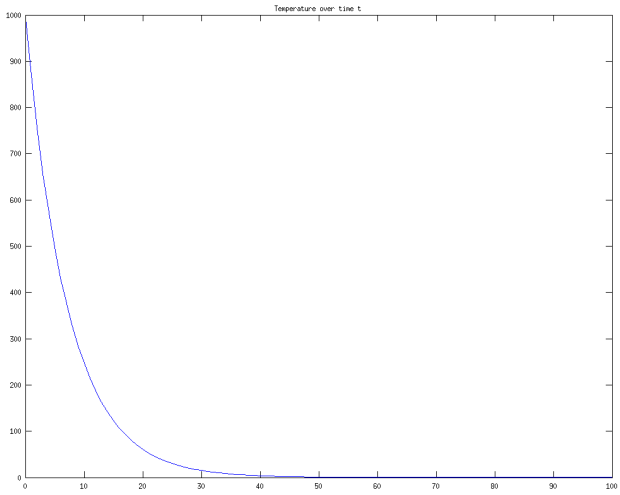

Figure 7: Temperature with respect to time

One can see that the mean-field annealing converges slightly slower than the simulated annealing approach (after 80 iterations instead of 60 iterations). However, considering the fact that the state space of the mean-field annealing is vastly bigger, it is still a good result.