**2 – Mountain Car Problem**

1. The state space consists all pairs of car position and car speed -

Where-

The action space consists of three actions where defines in which direction the car creates force (which effects the velocity of the car)-

The state-action reward is –  
Plot 2 main features. The most visited state is probably at the bottom of the hill with the maximum speed. There we should expect to be most of the time. And the features extracted will be activated strongly most of the time:

1. Encoding using RBF can give the following advantages:
   1. The RBFs can describe any none linear function as a superposition of its components. The as a vector is then used as linear combination of these RBFs to approximate any none linear function we wish. And we only need to solve a linear regression problem (instead of a none linear).
   2. We can reduce the states space to a different dimension, thus we can avoid the curse of dimensionality of states space (too big states’ space).
   3. We may use the “kernel trick” on these RBF kernel functions in order to avoid complex or big calculations in the states space.