HMC

**Hamiltonian**

Hamiltonian function:

In motion

H=势能+动能

,

,

So if m=1

Then

If m=1

If dropping

So

So H will not change with time

**Discrete** with leapfrog method.

With step size

**translating the density function for this distribution to a potential energy function**

P(X): pdf

E(X): some energy function

T=1

Z: normalize

So for H(x,p)

In parameter space:

:prior

: likelihood

Negative of the log of the un-normalised posterior density (NLP)

NLP space

Algorithm

1 initial with

2 loop for t=0,1,2...

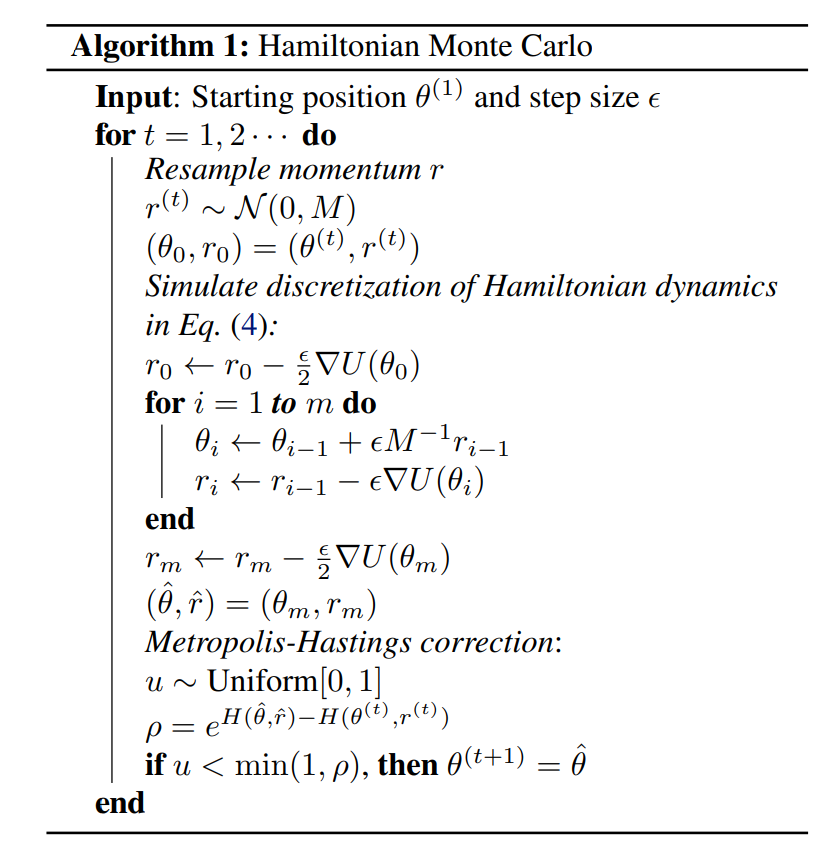
Generate new momentum p from

Solve the for new and with leapfrog with step size and L steps

Repeat the leapfrog for L steps

Accept with

If accept:



Tianqi Chen, Emily B. Fox, Carlos Guestrin. *Stochastic Gradient Hamiltonian Monte Carlo.* MODE Lab, University of Washington, Seattle, WA.

-log(binormal distribution)

