
Algorithm 1: Minibatch for WGAN

Input: x , The geometric brownian motion paths. z , noise data. D , discriminator. G , generator.

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while Max Iteration do
    Sample  $\{x^{(i)}\}_{i=1}^M \sim \mathbf{P}_r$  a batch from real data
    Sample  $\{z^{(i)}\}_{i=1}^M \sim p(z)$  a batch from fake data
    Partition real examples into  $N$  mini batches
    for  $i = 0, \dots, N$  do
        for  $j = 0, \dots, n_{critic}$  do
             $D_w \leftarrow \nabla_w \frac{1}{M} [\sum_{k=1}^M D_w(x_k^{(i)}) - \sum_{k=1}^M G(z_k^{(i)})]$ 
             $w \leftarrow +\alpha * RMSProp(w, D_w)$   $w \leftarrow \text{clip}(w, -c, c)$ 
        end for
         $G_w \leftarrow \nabla_w \frac{1}{M} [\sum_{k=1}^M D_w(z_k^{(i)})]$ 
    end for
end while
```
