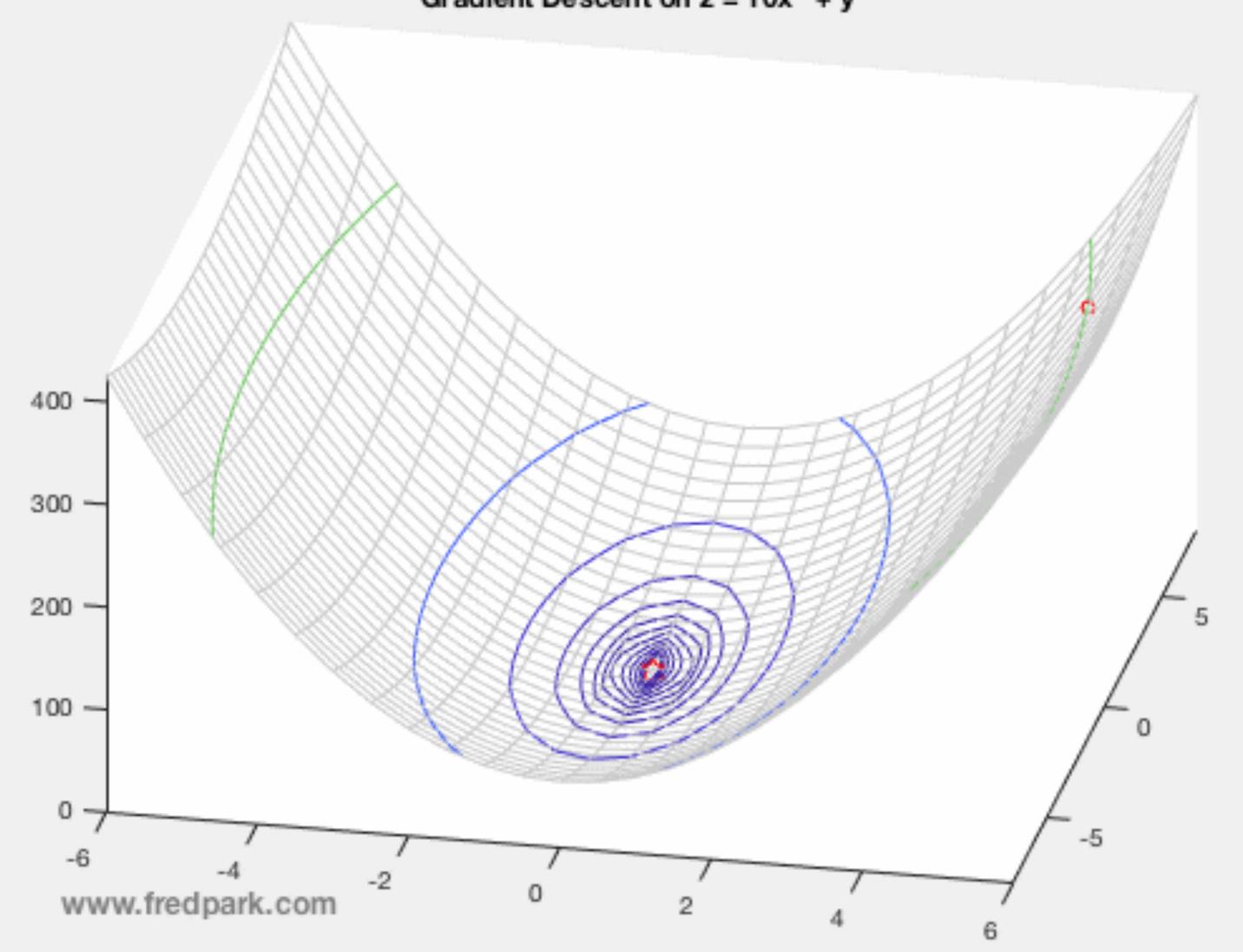
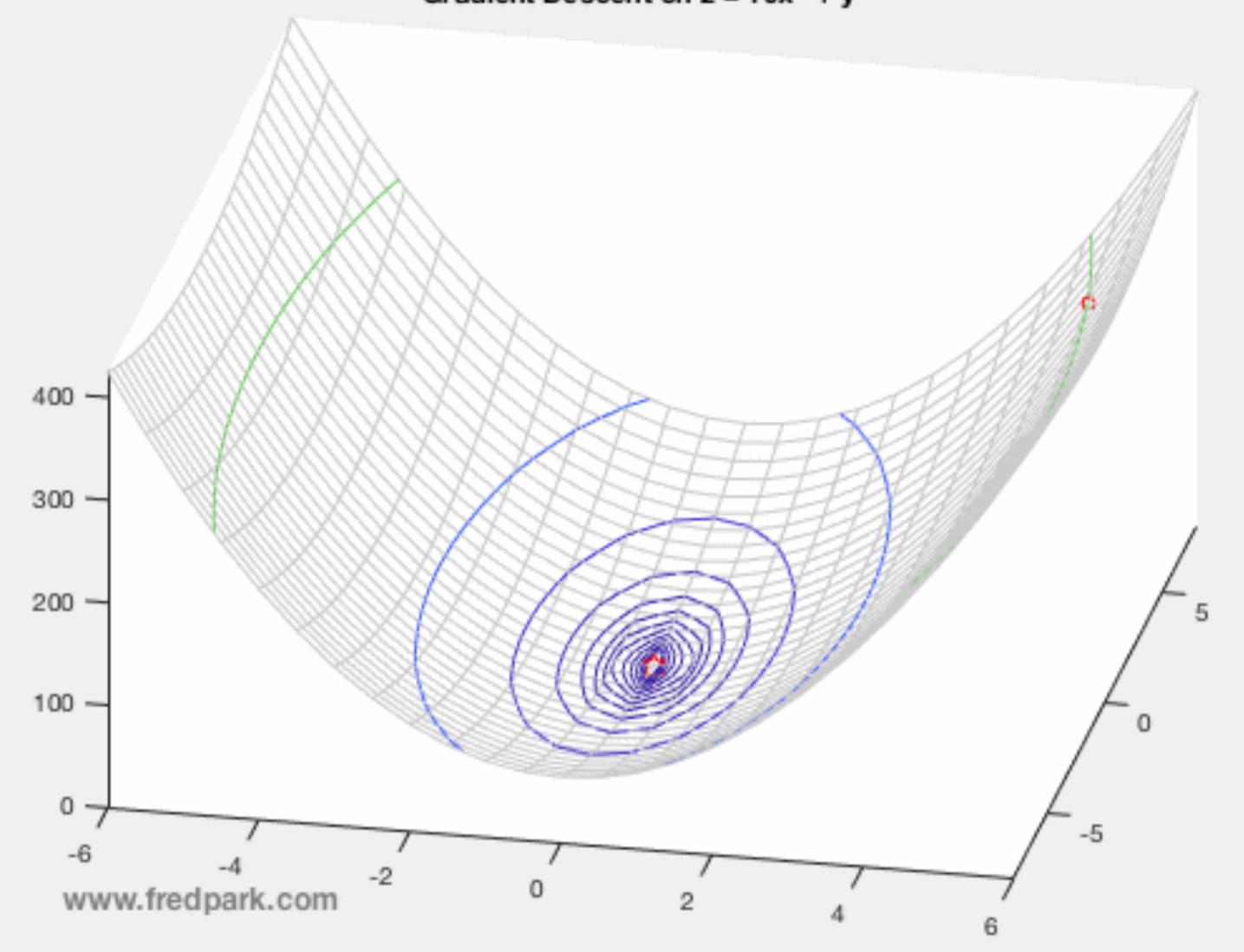


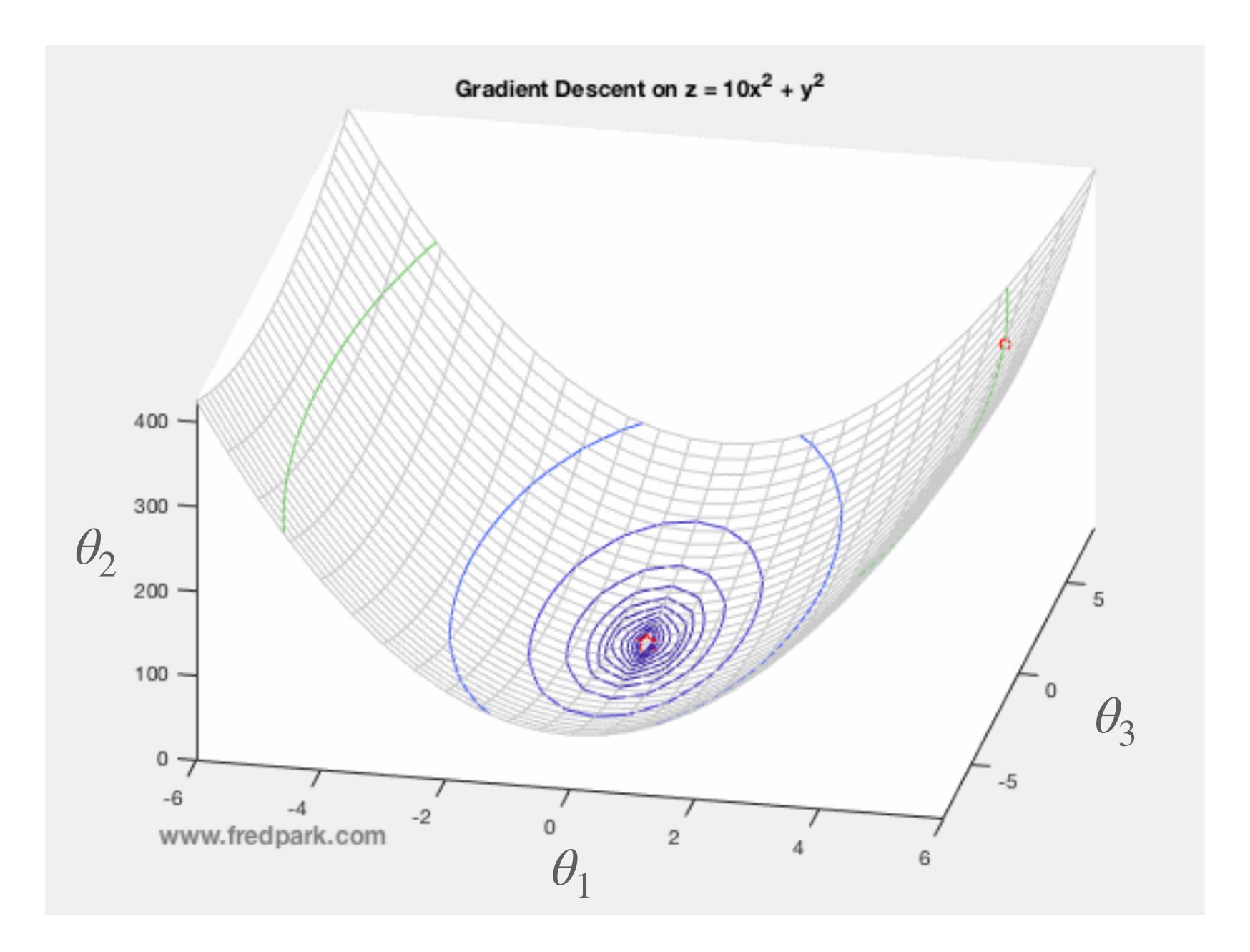
Gradient Descent on  $z = 10x^2 + y^2$ 



## http://www.fredpark.com/blog/gradient-descent

Gradient Descent on  $z = 10x^2 + y^2$ 





## Biology to ML models

- ML models rely on numeric data -> how do we translate biological constructs to numbers?
- Key is transforming unstructured data into information-preserving, numerical representations
  - Image data representation
  - Language data representation