

Reading Notes for Week 4

12.1 Introduction

A very important category of distribution is exponential family distribution. The choice of a link function in a Generalized Linear Model (GLM) is crucial because it defines the relationship between the linear predictor (a linear combination of the model parameters and the explanatory variables) and the mean of the response variable.

12.2 GLMs

Have learnt it in DS-GA-3001. GLM is one of the most important concepts in statistical learning theory. The key advantage of using GLM in machine learning is that once the distribution happens to fall into one of the category of exponential family, the log-likelihood function will be convex in the model parameter, and the optimization problem will become very easy. The book listed lots of exponential family distribution.

12.3 GLM with non-canonical Link Functions

We know that one of the characteristics of the GLM is that if we apply the link function on $E[Y|X]$, we get the model prediction. What surprises me is the use of other valid link function, each of which serves different purposes.