Research Experience

Subset Privacy and Its Application in Genomic Data

▶ Instructor: Jie Ding(UMN)

▶ Goal: We explored high-dimensional regression problem with data obfuscated by subset privacy framework

▶ My work:
   1. Implemented simulations to select causal SNPs positions based on obfuscated raw data, adding intervention by subset privacy method.
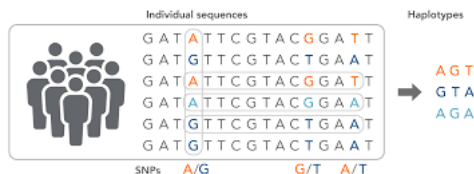   2. Explored subset design for more effcient feature selection under subset privacy framework.

Figure 1: SNPs

Research Experience

HKUST Summer Intern Program: Invariant Learning

- ► Instructor: Tong Zhang(HKUST)
- ► Goal: We tried to explore robust properties of Invariant Risk Minimization and its connection with Anchor Regression
- ► My work:
    1. Empirically implemented Anchor Regression and Invariant Risk Minimization algorithm in linear settings.
    2. Extended Anchor Regression into machine learning form and simulated in non-linear settings.

Figure 2: cow

Figure 3: camel

Research Experience

Diffusion-based Generative Model for Neural Structure[Ongoing]

- ▶ Instructor: Quan Wen(USTC)
- ▶ Goal: We wanted to generate 3D pointclouds for C.elegans' neural structure as a way of data augmentation
- ▶ My work:
    1. Applied Conditional Diffusion Generative Model for 3D point cloud generation of the C.elegans' neural structures.
    2. Explored the combination of Brownian Bridge Model and diffusion model for reversible and more stable point clouds generation.
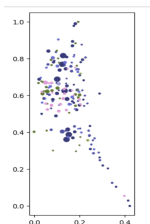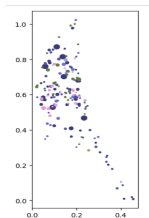

Figure 4: raw pointcloud

Figure 5: generated pointcloud