

This study investigates the data of the geomagnetic monitoring sensors through **matrix** approach, **KD Tree(KDT)** model and **Heuristic Filtering Based on Nearest Neighbor Algorithm(HFBNNA)**. By analyzing data from all sensors in specific range of time, we address three key questions:

Most Representative Data In 4 hours(Problem 1):

We introduce a matrix approach to accurately calculate the difference between the measured data and the initial data of each sensor. We further utilize the calculations in the difference matrix to find the most typical value for each time point in the given 4 hours.

Most Representative Data In 24 hours(Problem 2):

We use the identical approach concerning matrix in problem 1. However, the high requirement of the computer's VRAM caused by the huge amount of data prevent us using the method continuously. As some experiments are taken into practice, KDT are eventually chosen to seek out the consequences of the typical values in 24 hours' time point.

Signal Variation From Specific Object. (Problem 3):

Our findings highlight that:

We can solve some problems base on established mathematics model. For example. Filter out the effect of noise on the magnetic field. Measure magnetic field of certain object. Analyze factors causing geomagnetic field change. Predict the occurrence of natural disasters and take appropriate measures. Learn about the movement of the liquid core, and between the outer core and the mantle interaction.