Seismic refraction signal processing

In my term project, what I want to do is processing the seismic refraction signal that was collected months ago in Boise. We hope to derive information about the subsurface strata from valid refraction seismic signals. However, there is a lot of noise in the refraction seismic signal and we cannot use it directly. In order to better process the refraction seismic signal, we collected the refraction seismic data many times in the field. The refraction seismic signal was collected in traces of 72 points and five tests are repeated in the same place. Therefore, we can use geostatistical methods to process the random noise in refraction seismic signals. At present, we can calculate a lot of statistical properties (e.g. mean, standard deviation and etc.) of seismic data, because we have repeated the tests several times and we have a lot of data. Then we can extract some useful signals by these statistical properties. For example, the standard deviation from each point can be regarded as the uncertainty and we can give the data with larger uncertainty less weight. This is the primary application of statistics to refraction seismic signals, and I've also read in some papers about better ways to deal with refract seismic signals in a statistical way. For example, some specific correlation properties of seismic signals are used for determining the first arrivals. As we just learned about correlation, I believe it's not too hard for me to implement this algorithm. Besides, a statistical adaptive algorithm and neural network technique have been also used in processing low signal-to-noise data. I will try to use more new statistical methods to process the refraction seismic data we collect. Finally, I'll do an inversion with the processed refracted seismic data to see what's really interesting going on underground.