Geophysical Inversion is the recovery of the distribution of physical properties in the earth from a data set. One of the major concerns facing inversion is that the problem is non-unique, that is, for any data set provided, there are several possible models that predict the data given. Constraining the answer to be a geologically likely distribution is a major avenue of research in geophysical inversion. The most common way of resolving this non-uniqueness is regularization, adding the constant that the recovered earth model is small and smooth.

It is an enduring issue that geophysical inversion (the recovery of the distribution of physical properties from a data set) is an underdetermined problem. That is, for any data set provided, there are several possible models that predict the data given. Constraining the answer to be a geologically likely distribution is a major avenue of research in geophysical inversion.

Mathematically, there has been much work on the incorporation of a priori data, and in most cases it has been successfully resolved. However, taking information in the form of geological maps (both cross-section and plan view) and geological volume models (derived from drilling or other geophysical inversions), and transforming them into the forms used in these mathematical constraints.

While it is possible to achieve a model that approximates the truth from only the data provided, it is usually more fruitful to invert a data set with a priori information about the model (commonly in the form of drill holes, maps, and surface samples). The problem now becomes how to incorporate these a priori data into the inversion problem.

The intern has not only rendered the incorporation of maps into geophysical inversions possible, they have made it feasible for non-experts to do the same by incorporating the program written into the existing GIFtools Graphical User Interface. This will allow geologists and geophysicists in all fields to constrain their inversions with geological maps, reducing exploration time and increasing the reliability of inversion results.

On-going and future work focuses on the sophistication of constraints derived from geological models. Specifically is focuses on the use of parametric inversion of geological units in the models to better asses the level of constraint in different regions of the model. The intern was not hired afterwards.