

# Surface-Wave Inversion

---

Joseph Vantassel, University of Texas at Austin

## Purpose

The purpose of this assignment is for you gain practice performing surface-wave inversions using a common inversion algorithm. The inversion algorithm which you are going to use is called the Neighborhood Algorithm. It was developed by Sambridge (1999a) and implemented in a C++ framework by Wathelet (2004; 2005; 2008). The software is open-source and freely available from [geopsy.org](https://geopsy.org)

## Assignment Instructions

1. Download and install, the latest release of geopsy (see link above).
2. Run the program dinver, and load the provided file `siteA.txt` in as a target using the graphical user interface.
3. Decide on an appropriate parameterization using the dispersion data as a guide.
4. Run 20k trial models set  $Ns0=10000$ ,  $It=100$ , and  $Ns=100$ . (Note that for real data you will likely want to run between 100k - 150k models by increasing  $It$  and  $Ns$ ).
5. Repeat this process 3 times, comment on the differences between the runs.
6. View and plot the best model(s) and provide an estimate (can be qualitative) of their uncertainty.
7. Repeat steps 2-6 for the other site's provided, if no uncertainty in the experimental data is provided assume a coefficient of variation (COV) of 0.05.