Teaching Tools for Geophysics

By

R. Phillip Bording*, David Churchill, and Sebastian Padina

Department of Earth Sciences
Memorial University of Newfoundland
St. John's, Newfoundland
Canada

Abstract
The use of packaged software is a vital part of the undergraduate/graduate experience in teaching geophysics. But the lack of source code accessibility and further the limitations on changing source code for experiments hinders effective teaching. We are developing a set of open source tools for teaching geophysics. These tools use various programming languages, provide interactive and "batch" computing resources for student projects. Among the programming languages we use; Java, Fortran 90, and C and parallel programming with MPI. We find earth science students lack C++ skills and have limited exposure to programming in general. To overcome these deficiencies computational science students were recruited to provide an influx of knowledge and skills to the geo-type students. Further, the high end visualization hardware has placed a real burden on the available skill base for geophysical research. Hence, we are supporting a full time research associate to develop these large scale visualizations processes. We look forward to the development of open source tools for the educational processes in geophysics as a community wide effort.

I will briefly review a layer based tomography package, 3D visualization tools, model building tools for shot record synthesis, and a basic parallel programming support package for developing parallel codes.