The Development of BasinVis: Lessons learned from an open-source collaboration of geoscience and computer science

Johannes Novotny  
Department of Computer Science, Brown University, Providence, RI, United States of America  
(johannes_novotny@brown.edu)

Geoscience is a highly interdisciplinary field of study, drawing upon conclusions from physics, chemistry and many other academic disciplines. Over the course of the last decades, computer science has become an integral component of geoscientific research. This coincides with the rising popularity of the open-source movement, which helped to develop better tools for collaboration on complex software projects across physical distances and academic boundaries.

However, while the technical frameworks supporting interdisciplinary work between geoscience and computer science exist, there are still several hurdles one must take in order to achieve successful collaborations. This work summarizes the lessons learned from the development of BasinVis from the perspective of a computer science collaborator. BasinVis is a modular open-source application that aims to allow geoscientists to analyze and visualize sedimentary basins in a comprehensive workflow. A particular development goal was to introduce the advances of 2D and 3D visualization techniques to the quantitative analysis of the stratigraphic setting and subsidence of sedimentary basins based on well data and/or stratigraphic profiles.

Development of BasinVis started in 2013 with its first release as a MATLAB GUI application in 2016. Apart from functionality, one of the major problems to solve in this period was the alignment of research goals and methodology, which may diverge greatly between geoscience and computer science. Examples of this would be to clarify the scientific terminologies of each fields early on and to clearly establish the expected results of the application in terms of mathematical accuracy and uncertainty (a concept that may catch computer scientists off guard).