

Provenance Visualization Helps Scientists Understand and Share Data

Grant #: HRD-0734825

Outcome: Provenance has been used to explain how, when, where, and even why graphs, images, maps and all sorts of scientific products were derived from scientific data. To facilitate the human consumption of large collections of provenance associated with data, CyberShARE, the NSF-funded CREST Center at the University of Texas at El Paso, has developed ProbeIt. ProbeIt is a browser that supports the visualization of provenance along with visualizations of intermediate scientific results that stem from the process of deriving a scientific product. .

Impact/benefits: ProbeIt is being used at CyberShARE to help scientists understand the computation of 3D tomography models of the inner structure of the Earth. In collaboration with Rensselaer Polytechnic Institute (RPI), ProbeIt assists scientists in understanding the processing of the Sun's images by the National Center for Atmospheric Research. Other applications through RPI include the explanation of NASA Earth science remote sensing data and Australian Commonwealth Scientific and Industrial Research Organisation's weather predictions.

Background/explanation: The provenance of a scientific product includes metadata, which can be used to explain the origin of the product. Though the use of W3C semantic technology that encodes conventional provenance collected by scientists, a tool such as ProbeIt exposes these metadata as a rich graph that can be processed by machines. The goal is to make provenance more understandable by scientists.

ProbeIt leverages conventional information and scientific visualization techniques to display provenance. Scientific visualizations along with a rich collection of interaction models allow scientists to inspect data-derived products in novel ways, creating opportunities for new scientific discoveries.

Images/videos understandable by general audience, with captions and credits



*Caption: ProbeIt demonstration at CyberShARE Steering Committee meeting
Credit: Dr. Rodrigo Romero.*