

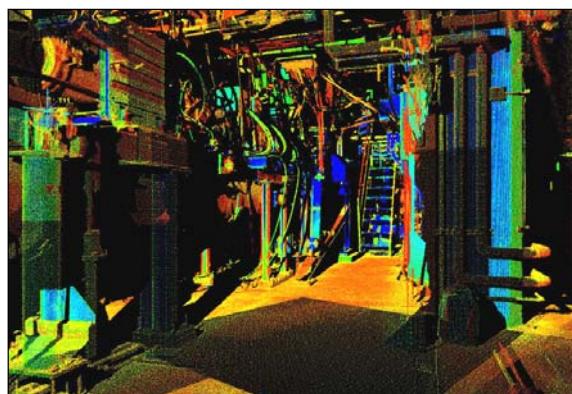
The 9th International Workshop on Accelerator Alignment



MicroLEGO Visualizing Survey Data in MicroStation

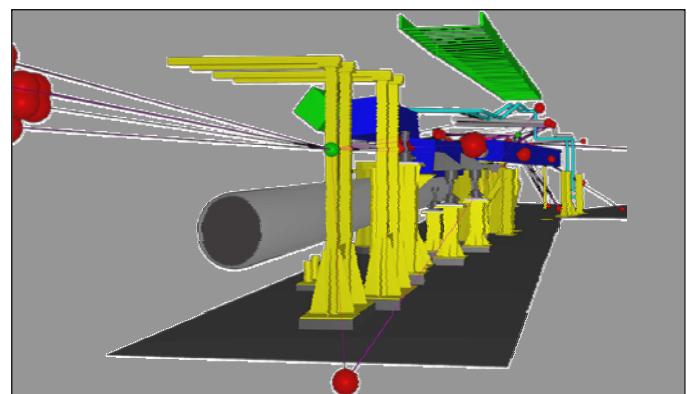
Brian Fuss, Stanford Linear Accelerator Center

A new application called MicroLEGO has been developed using the MicroStation Development Language (MDL). MDL is an open architecture language allowing complex software modules to be added to the CAD environment. MicroLEGO is a new tool that can be used to simulate survey data by providing a visual aid that represents either actual or simulated survey observations. SLAC's LEGO program (the engine behind SIMS, a program used for network simulations) has been used as a stand-alone application and now, with the addition of MicroLEGO, output data from LEGO can be visually incorporated into existing or newly created CAD models. The software can also be used to design surveys within the CAD environment and output the data to LEGO for processing. The software works for as-built surveys of existing structures or virtual surveys of planned structures. Presently MicroLEGO is independent of LEGO, simply reading or creating input and output files passed to or from the graphical setting. Future updates are being considered where LEGO could be directly executed from inside the MicroStation CAD environment.



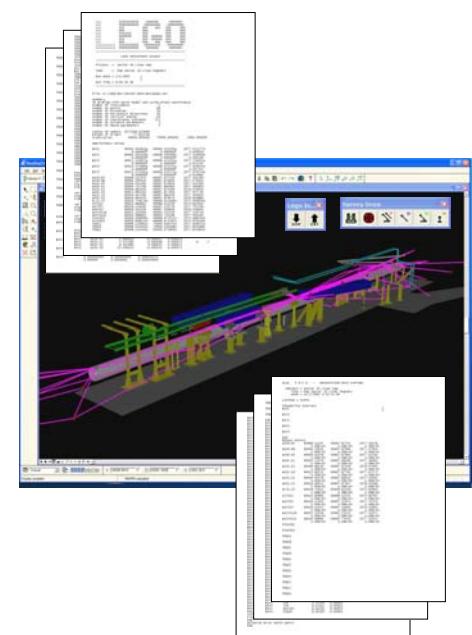
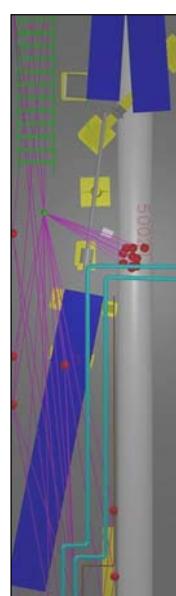
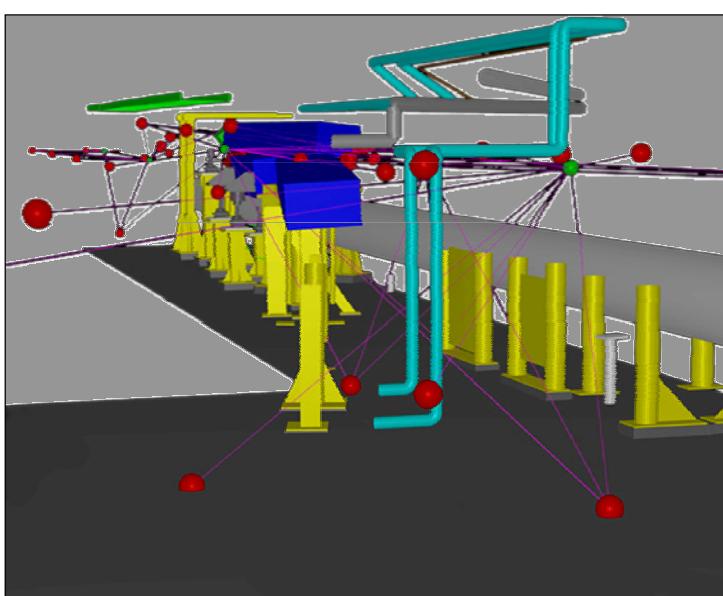
Laser Scan of BSY

Point cloud output from a laser scanner (Imager 5003, Zoller+Fröhlich) showing part of the Beam Switch Yard (BSY) at SLAC. With a resolution of 0.01° and accurate to about 3mm, this laser scan was processed using Leica's Cyclone software and was then used to create a CAD model of the region.



Model of BSY with Survey Objects

Components of the BSY were modeled by members of the Alignment Engineering Group (AEG)* using the laser scanner data. This 3D model was then used as a backdrop for the incorporation and display of actual field survey data. MicroLEGO was used to import the data into MicroStation where the red spheres represent targets and green spheres are instrument locations.



Using MicroLEGO

A survey of the BSY was used for development and testing of the first version of MicroLEGO. To create the CAD model of the survey data, tools were added to MicroStation (icons and/or drop-down menus) using C-coded MDL modules. Text files of the processed adjustment data generated by LEGO were interpreted by MicroLEGO and then converted into a 3D representation of the survey. Alternatively MicroLEGO can also be used to create a virtual survey inside any CAD model that is readable by MicroStation. Tools are available to create and edit instrument stations and targets, including the observations between them. Whether the CAD model is from real survey data or is virtual, all survey data can be moved, altered or eliminated in the visual environment.