Title: Object-oriented Design of Simultaneous Bundle Adjustment Software for the Georectification of Multi-Angle Imaging SpectroRadiometer (MISR) and Airborne Multi-angle Imaging SpectroRadiometer (AirMISR)

Category: Presentation of Specific IT work at JPL (Science)

Authors & organizations: Mike Smyth - 381

Abstract:

The Multi-Angle Imaging SpectroRadiometer (MISR) is part of NASA’s Terra spacecraft, launched into a polar orbit around Earth on December 18, 1999. MISR is unlike any previous instrument, it acquires multi-spectral images at nine discrete angles. AirMISR is an airborne instrument flown on the NASA ER-2, which acquires multi-angle data similar to MISR. There are a number of challenges in performing geometric camera calibration, coregistration and geolocation of the MISR and AirMISR data.

This poster describes the design of the software used to do the camera calibration and georectification of MISR and AirMISR data. We focus on a portion of the software: the Simultaneous Bundle Adjustment which uses automatically collected tie points to perform corrections to the camera calibration and ephemeris and attitude error models.

The software was our group’s first experience with doing an object oriented design and implementation. Originally developed for MISR, it proved highly successful. The software was later extended to work with a significantly different system, the AirMISR system. The software was extended with very little change to the underlying architecture, proving the robustness of the object oriented design.
Title: Object-oriented Design of Simultaneous Bundle Adjustment Software for the Georectification of Multi-Angle Imaging SpectroRadiometer (MISR) and Airborne Multi-angle Imaging SpectroRadiometer (AirMISR)

Category: Presentation of Specific IT work at JPL (Science)

Authors & organizations: Mike Smyth - 381

Abstract:

The Multi-Angle Imaging SpectroRadiometer (MISR) is part of NASA's Terra spacecraft, launched into a polar orbit around Earth on December 18, 1999. MISR is unlike any previous instrument, it acquires multi-spectral images at nine discrete angles. AirMISR is an airborne instrument flown on the NASA ER-2, which acquires multi-angle data similar to MISR. There are a number of challenges in performing geometric camera calibration, coregistration and geolocation of the MISR and AirMISR data.

This poster describes the design of the software used to do the camera calibration and georectification of MISR and AirMISR data. We focus on a portion of the software: the Simultaneous Bundle Adjustment which uses automatically collected tie points to perform corrections to the camera calibration and ephemeris and attitude error models.

The software was our group's first experience with doing an object oriented design and implementation. Originally developed for MISR, it proved highly successful. The software was later extended to work with a significantly different system, the AirMISR system. The software was extended with very little change to the underlying architecture, proving the robustness of the object oriented design.