Automated Kaguya TC and MRO CTX Stereo DEM Generation

5th Planetary Data Workshop and
2nd Planetary Science Informatics & Data Analytics Meeting
Processing Session 1: June 28, 2021

Lauren A. Adoram-Kershner, ladoram-kershner@usgs.gov
Ben H. Wheeler, bhwheeler@usgs.gov
Jason R. Laura, jlaura@usgs.gov
Robin L. Fergason, rfergason@usgs.gov
David P. Mayer, dpmayer@usgs.gov
Motivation

- The volume of stereographic images coupled with manual generation standard means a lot of DEM potential.

- Targeted generation; not covering full datasets.
  - Served across various research institutes applying their own processing.
  - Difficulty tracing provenance of processing typically contained in separate paper(s).

Figure 2: Distribution of Kaguya TC stereopairs.
ASAP-Stereo, Ames Stereo Automated Pipeline

A. M. Annex, K. W. Lewis. Department of Earth and Planetary Sciences, Johns Hopkins University, Baltimore, MD 21218, USA (annex@jhu.edu)

@AndrewAnnex annex@jhu.edu www.andrewannex.com
What is ASAP-Stereo?

1. Python Library and CLI, higher-level wrapper for Ames Stereo Pipeline
2. Framework to implement ASP workflows, currently implements “asp_scripts” for HiRISE & CTX with enhancements

Why use ASAP-Stereo?

1. Reproducibility with Jupyter Notebooks, avoid ad hoc processing!
2. Speedups over asp_scripts
3. Ease of use, less monitoring
Try ASAP-Stereo!

Welcoming contributions for other instruments!

Links:

https://asap-stereo.readthedocs.io


https://github.com/AndrewAnnex/asap_stereo

https://doi.org/10.5281/zenodo.4171570
High-Throughput Processing of Diviner Data from the Planetary Data System (PDS)

Norbert Schorghofer (norbert@psi.edu)
Planetary Science Institute, Arizona & Hawaii
June 2021, Lightning Presentation, Abstract #7004

▶ The PDS currently holds about 2 PB of data; High-throughput data processing is increasingly important
▶ Case Study: Diviner, onboard LRO, 160 TB of numerical data
▶ Benchmarked various compression file formats for these data
▶ Benchmarked decompression | awk
▶ Benchmarked parallel processing from single drive (HDD + SSD)
▶ How can I get my hardware’s worth of throughput, or more?
Parallel Throughput, Solid State Drive (SSD)

<table>
<thead>
<tr>
<th># Parallel Processes</th>
<th>Throughput (GB/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>txt</td>
</tr>
<tr>
<td>2</td>
<td>gzip</td>
</tr>
<tr>
<td>3</td>
<td>lz4-9</td>
</tr>
<tr>
<td>4</td>
<td>lzma</td>
</tr>
<tr>
<td>5</td>
<td>zip</td>
</tr>
<tr>
<td>6</td>
<td>zstd-19</td>
</tr>
</tbody>
</table>

Throughput relative to uncompressed file size.