Study on Application of Aero-photography and Remote Sensing Systems by UAV in Mapping of Gansu West Plateau Mining Area

Wei Hao and Ya-Han Zhang
Plateau Topography 1:2000

UAV
Key Technology
1. UAV

- Wing: 2590mm
- Max weight: 17kg
- Duration time: 2h

UP30 Ground Control Station

Camera: Nikon D800
Key Technology

1. UAV

<table>
<thead>
<tr>
<th>Sortie</th>
<th>Forward overlap</th>
<th>Side overlap</th>
<th>Forward interval /m</th>
<th>Exposure interval /m</th>
<th>GSD/m</th>
<th>Number of photos</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>75</td>
<td>45</td>
<td>300</td>
<td>100</td>
<td>0.14</td>
<td>987</td>
</tr>
<tr>
<td>2</td>
<td>75</td>
<td>45</td>
<td>300</td>
<td>100</td>
<td>0.14</td>
<td>988</td>
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</tbody>
</table>

The ground resolution: 0.14m
Air relatively height: 1000m
Absolute flying height: 4200m
Key Technology
2. Photo control survey

The first flights Lay 18 landmark control points. The second flights
Key Technology

2. Photo control survey

Use PPP and fast static GPS technology to measure the GCPs
3. Date process

Use Pix4DMapper to add GCPs and make DSM and DOM
3. Date process

Aerial triangulation and Stereomapping

Use ImageSation SS, VirtuoZoNT and other softwares
Create 3 square kilometers of 1 : 2000 topographic maps.
Compared with the digital surveying and mapping

<table>
<thead>
<tr>
<th>Aerial and field Photo Control measurement</th>
<th>12 people</th>
<th>3 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data processing</td>
<td>6 people</td>
<td>7 days</td>
</tr>
<tr>
<td>Provide DOM, DSM ,DLG,DEM</td>
<td></td>
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<td>Costs only about 1/3 of the conventional measure</td>
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Digital surveying and mapping? A lot of people and time
Conclusion

Obvious advantages of the aerophotogrammetry by UAV to make topographic map in western Gansu mine

- Greatly reduce the workload of field measurements, ensure worker safety;
- Meet the accuracy requirements specification;
- Play more important role in the digital mine construction;
- Promoted in a particularly difficult area, such as desert;
- Aerial aircraft fly to reach the absolute 4200m steadily.
Thank you