
Subject: Re: stereo triangulation in IDL
Posted by [Klemen](#) on Sat, 15 Sep 2012 20:52:33 GMT
[View Forum Message](#) <> [Reply to Message](#)

On Saturday, September 15, 2012 7:31:41 PM UTC+2, (unknown) wrote:

> Hey,
>
> I want to calculate the top height of a cloud using pictures of two satellites, but I'm kinda new to this stuff and figured that stereo triangulation should do the trick. Does anyone know if there already is a procedure doing stereo triangulation out there? That would be great, 'cause it looks really complicated. I wouldn't know how to programm something like this.
>
>
>
> regards, Haiko

I am just finishing a paper for ACP on this topic (Monitoring volcanic ash cloud top height through simultaneous retrieval of optical data from polar orbiting and geostationary satellites). My procedure is not based on triangulation, but on area image matching (3-level pyramids). If this helps, let me know.

Cheers, Klemen

Subject: Re: stereo triangulation in IDL
Posted by [derkleinepilz](#) on Mon, 17 Sep 2012 18:08:44 GMT
[View Forum Message](#) <> [Reply to Message](#)

On Saturday, September 15, 2012 10:52:33 PM UTC+2, Klemen wrote:

> On Saturday, September 15, 2012 7:31:41 PM UTC+2, (unknown) wrote:
>
>> Hey,
>
>>
>
>> I want to calculate the top height of a cloud using pictures of two satellites, but I'm kinda new to this stuff and figured that stereo triangulation should do the trick. Does anyone know if there already is a procedure doing stereo triangulation out there? That would be great, 'cause it looks really complicated. I wouldn't know how to programm something like this.
>
>>
>
>>
>
>>
>
>> regards, Haiko

>
>
>
>
>
> I am just finishing a paper for ACP on this topic (Monitoring volcanic ash cloud top height through simultaneous retrieval of optical data from polar orbiting and geostationary satellites). My procedure is not based on triangulation, but on area image matching (3-level pyramids). If this helps, let me know.
>
>
>
> Cheers, Klemen

That sounds interesting. I've heard of the 3-level pyramids, but I thought that you could just use that as some kind of stereo-matcher. So how exactly do you calculate any height information? (Btw, coincidentally my research is also about volcanic ash cloud top height ;-))

Subject: Re: stereo triangulation in IDL
Posted by [Klemen](#) on Mon, 17 Sep 2012 21:52:03 GMT
[View Forum Message](#) <> [Reply to Message](#)

On Thursday I will submit the discussion paper for ACP, then I can post the link here. But a shorter version is: everything is based on parallax. :)

I have both datasets in the same projection plane. I use moving window analysis that correlates both datasets. The pixel pair with the highest correlation is the one I am interested. Shifts are then just the differences in the array indices. For each pixel in the array I know the lon, lat, I know the satellite position, so I can generate two lines. From the intersection point between these lines I can compute the height.

Processing over pyramids is faster and it considers the larger scale features and the small scale features. Correlation is first analysed on the coarse level data. Once I have the indices I can just proceed to more detailed pyramid, where the previously determined shifts are the basis for the moving window analysis.

So much in short, if you need more details, I can provide them in the following days!
Klemen
