



Geomatics Newsletter

Volume 4 Issue 1 Week 6 2011



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Introduction new Geomatics student



Hello all, I am Koen Ten Holter,

I guess I have a bit of a different background than most. Five years ago I completed the Royal Netherlands Naval College where I specialized in sonar processing and visualization, and I currently work as a lieutenant in the Royal Netherlands Navy.

I have chosen to do this master because it very much relates to my operational experience as well as my current job, which revolves around various aspects of remote sensing and integration of different types of sensors. I'm looking forward to study again, albeit part-time, and to expand my practical experience with a more theoretical understanding of geo-information and remote sensing.

I currently live in Wieringerwerf (a village in the north of Holland) with my wife Marieke, and in my free time I'm an avid snowboarder, mountainbiker and martial arts enthusiast. I am looking forward to meet you all in the upcoming months!

TUDar

TUDar - short for TU Delft augmented reality - is a student project run by three Geomatics students. Our goal is to bring geographical information (the where? of things) and augmented reality to the TU Delft campus. We are amazed (and maybe therefore driven) by two things: geographical information (and its omnipresence in our society) and the total lack thereof on the TU Delft campus. We want to change this.

Geographical information is all around us. Nowadays, knowing your location is as trivial as paying for your goods, calling with your friends, riding a bike. Geographical information pops up in almost all disciplines of science and engineering. Large companies like Google, Shell, TomTom are exerting themselves to increase their knowledge, understanding and control of geographical information. And yet, the TU Delft campus is quiet and void of any geographical sounds and even whispers. We want to change this.

Our goal, therefore, is to bring geographical information to the TU Delft campus. By building on top of the Layar augmented reality application we want to bring (campus) geographical information to the campus and show what it can be used for. Along the way we want to shed some light on MSc Geomatics while having (serious) fun with geographical information.

MSc Geomatics

The science of geographical information is called Geomatics. Geomatics deals with the gathering, processing, analysing and presenting of geographical information. It spans everything from remote sensing to computer science. Geomatics lies at the base of many Civil Engineering projects, fleet management, urban area monitoring, planning and development and many others. Geomatics is at the base of so many other fields it tends to dissolve in the background. Geomatics is then taken for granted. We want to bring Geomatics back to the front and let it shine its bright light.

Have fun

Having fun with geographical information and augmented reality is easy. Quick! Think about Nuna's

Graduation Presentation

On the 4th of January Jonathan Stam has given his graduation presentation. Below you will find the abstract of his thesis.

Accuracy assesment of direct sensor orientation in UAV photogrammetry



His Thesis presentation
Jonathan Stam



Presentation: Tuesday 4th of January 2011, 14:00
Faculty of Aerospace Engineering,
Lecture room C,
Kluyverweg 5,
Delft

Graduation party:
Tuesday 4th of January 2011, 20:00 – 1:00
Cafe Nieuwens
Stapel de Groenmarkt 116B
Delft

Abstract:

With the advent of Unmanned Aerial Vehicles, it becomes possible to use these vehicles to acquire photogrammetric images in a more cheap and flexible way compared with conventional photogrammetry from a full-sized airplane. A big factor in costs and resources in conventional photogrammetry is signalling and measuring ground control points, which are necessary to determine the location and attitude of the photos. Eliminating the need for ground control points would make the photogrammetric process much less costly and labour intensive.

A UAV contains navigational sensors (a GPS receiver and a Inertial Measurement Unit) for it's own navigation. The output of these sensors can also be used for the orientation of the photographs. However, the accuracy of these sensors, especially low cost off-the-shelf sensors, is limited.

This thesis concentrates on determining the accuracy of low-cost navigational sensors and the effect of inaccuracies in these sensors on the result of the photogrammetric product: a Digital Terrain Model. Using a UAV developed by the company Heering UAS, founded by Pieter Wijkstra, the effects of inaccuracies in the GPS receiver and the IMU in the UAV on the outcoming Digital Elevation model has been tested. First the theoretical effects of inaccuracies of navigation sensors on the final product is investigated, using the photogrammetric collinearity equations. To validate the theoretical results, a number of tests has been carried out using an available platform with an off-the-shelf camera and dito navigation sensors.

A first test, using flight data and photos taken at the unfinished A4 highway site just south of Delft, shows the sensitivity of the final model to errors in the navigational sensors. This test did not give enough data though to give enough insight in the effects of navigational sensor errors. Therefore a second test was carried out using a larger photoblock flown at the dyke of the river Lek at Ammerstol. This test showed that the errors in the terrain model caused by errors in the on-board GPS receiver follow the results of the theoretical simulation. However, because at the time, the UAV did not contain a reliable IMU, the effect of IMU errors could not be tested. So a third test was conducted, using an

driving around the Mekelpark or your Architecture friend's building proudly standing next to the EWI building or your Industrial Design friend's cool lawnmower/chair/door in full 3D on top of the green hills in front of the ID building. The possibilities are endless.

Have serious fun

With serious fun we mean building and deploying applications and tools which use geographical information to empower their users to do more with their environment.

But for all this to successfully work we need you! We need your ideas, fantasies and dreams. What do you want to use Layar for? Have you got some cool 3D content which you want to show off? Do you have scientific data which you want to display? Do you have an idea how to augment the Mekelpark? Please feel free to contact us! The technology is there, now we need the content.

web: <http://www.gdmc.nl/tudar>

twitter: @SimeonNedkov, @homing85

facebook:

http://www.facebook.com/home.php?sk=group_165910756770077&ap=1

App in a Day event on 16th of February 2011

Dear students,

Are you passionate about geographical data? Do you also believe that geographical data should be open and available to all to play with? Have you ever wanted to display your geographical knowledge to the rest of the world? Have you ever wondered what geo-enthusiast and professionals outside the university are doing? Then this is your chance!

Let us attend the App in a Day event on the 16th of February and show what we can do with geographical data and why it should be made available to all to play with.

The challenge is simple: build an app/tool/service/whatever using open geographical data, which will enable citizens to discover, explore and learn more about their direct environment. The event is open to all who are passionate about geographical data and are willing to share their knowledge and skills with others. Check out the (Dutch) website:

<http://weblogs.vpro.nl/nederlandvanboven/appinaday/>

- The App in a Day event is organised by VPRO: Dutch television broadcaster working on a series called Nederland van Boven (The Netherlands from Above) after BBC's Britain from Above (<http://www.bbc.co.uk/britainfromabove/>).
- Geonovum
- Hack de Overheid: a group of people trying to break free governmental data so that we all benefit through an increase in governmental transparency. Also, when data is open, anybody with a small degree of knowledge can put it to good use.
- Ambtenaar 2.0: a group of people working on getting the government to use 2.0 web

off-the-shelf IMU combined with a high accuracy GPS receiver to assess the effect of errors in the IMU on the resulting terrain model.

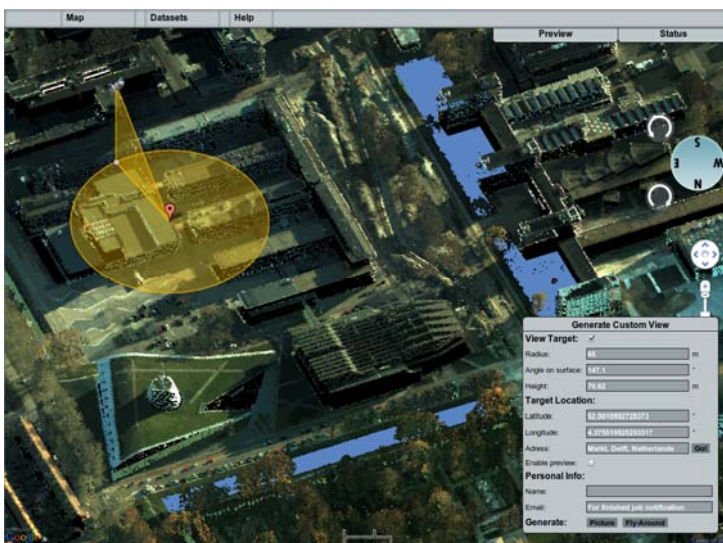
The results show that off-the-shelf navigation sensors are not accurate enough to produce a reliable end result. Therefore eliminating ground control points would result in a final product which is not accurate enough. Using the available navigation sensors it is possible to reduce the amount of ground control points.

All Master Theses can be uploaded via <http://repository.tudelft.nl/>

Minor 3D Virtual Earth

For the second year in a row, the TU Delft minor "3D Virtual Earth" has attracted students from different faculties interested in 3D geo-information, web technologies and visualisation. For the final projects of the minor, they had to build "their own 3D Earth model application" and they have produced great results.

Sjoerd Huininga (3mE), Monica Zeestraten (AE), Jasper de Lange (3mE) and Lars Wijtemans (EEMCS) have built a 3D web-based viewer for exploring massive point clouds, such as the AHN2 dataset. Their application permits us to have an oblique view on the model, and even to generate on-the-fly movies of a given building or area.



Freek K the (EEMCS) and Remco van der Zon (EEMCS) have built a repository for the geo-data of the Climate City Campus project at TU Delft (<http://ccc.tudelft.nl>), which aims at making the campus a showcase for multidisciplinary environmental research.

Finally, Maikel Krause (EEMCS) and Sander Spruijt (EEMCS) have developed a web-based application that permits us to perform the edge-matching of GIS datasets in a novel way.

The details of projects carried out are available at <http://3dve.tudelft.nl/results2010>, and you can also test for yourself the applications they built!

The minor 3D Virtual Earth will also be offered in 2011, for more information: <http://3dve.tudelft.nl>

technologies.

Are you itching to get started and meet some crazy smart people working with geographical information in a new and fresh way? Good! Send an email to Elfriede Fendel (e.m.fendel@tudelft.nl) or me (s.b.nedkov@student.tudelft.nl) and we'll organise a nice outing to Meeting Plaza in Maarsse (<http://www.meetingplazamaarsse.nl/>).

Simeon Nedkov

PS Please spread the word!

Geomatics Diploma Ceremony & Best Geomatics Laureate

On Friday the 18th of February the Geomatics Diploma Ceremony, starting at 16.00 hours, takes place at the Faculty Civil Engineering & Geosciences (Room G). During this ceremony Dinesh Kalpoe, Jonathan Stam, Efstratios Tsompanopoulos, Stijn Verlaar and Hang Yu will receive their diploma. Hang Yu also graduated. As far as we know Hang Yu will not be present, because she went back to China.

Besides our Best Geomatics Laureate 2010 will be announced.

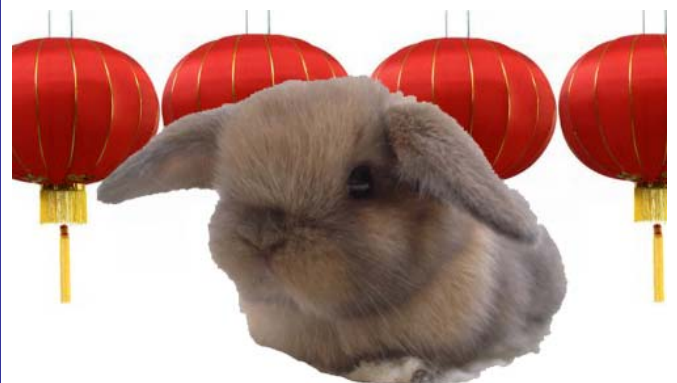
Schedule Graduation Colloquia

The schedule for the graduation colloquia for the first half of 2011 is as follows:

- 18th of February (Room 1, AE)
- 18th of March (Room 1, AE)
- 15th of April (Room 7:18, AE)
- 20th of May (Room 7, AE)
- 17th of June (Room 7, AE)

All colloquia take place in the afternoon, the exact starting time depends on the number of presentations.

Happy New year to all our Chinese friends on behalf of the Geomatics Community



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