

MAPS TODAY

Monthly Publication

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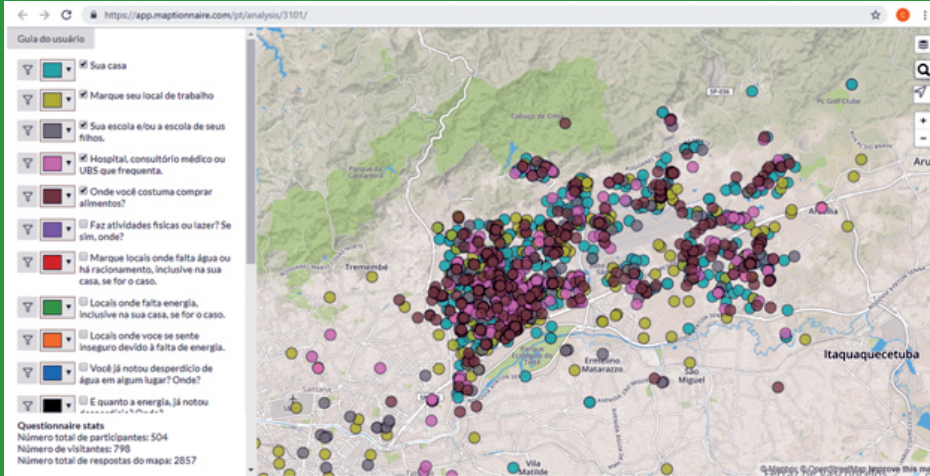


Fig 3. Survey answers in Maptionnaire screen

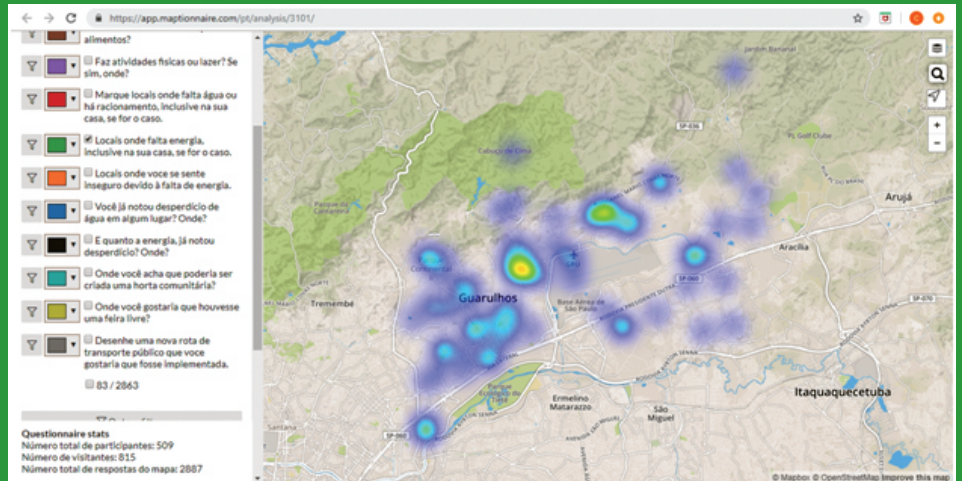


Fig 4. Areas with lack of energy

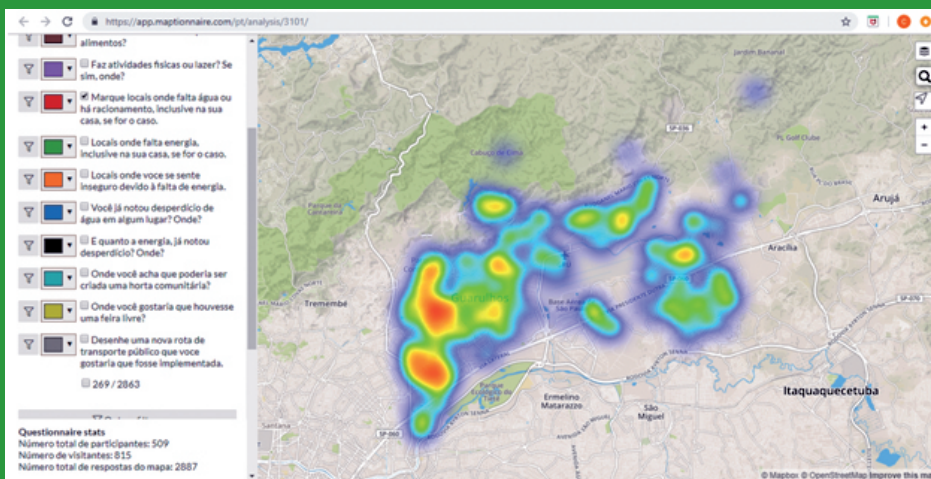


Fig 5. Areas with lack of water.

(For details see page.....20)

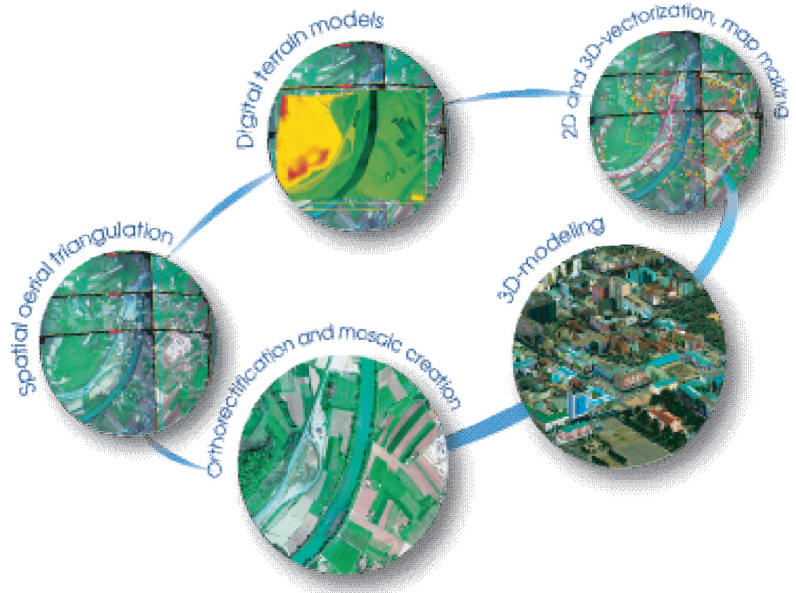


Overview



RACURS, Russia

PHOTOMOD®



The PHOTOMOD software family comprises a wide range of products for the remote sensing data

photogrammetric processing. This state-of-the-art software allows the extraction of geometrically accurate spatial information from almost all commercially available types of imagery, whether obtained by film or digital cameras, [UAS](#), high resolution satellite scanners.

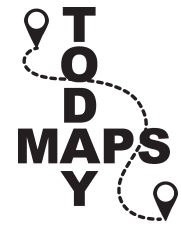
PHOTOMOD's flexible modular architecture and powerful import/export tools permit a variety of configurations: **Complete Digital Photogrammetric Workstation** (standalone configuration), high productivity distributed network environment for accomplishing large projects, complementary workplaces that can be used along with third-party systems to increase the overall productivity during the most time-consuming and labor-intensive operations like feature extraction and DTM creation.

Today PHOTOMOD is the most popular digital photogrammetric software in Russia and is also used in [70 countries](#) all over the world. PHOTOMOD is the only digital photogrammetric system with the Russian Federation [Ministry of Defense](#) certificate and also the main digital photogrammetric software for the Federal Space agency of the Russian Federation ([ROSCOSMOS](#)) and Russian Federal Service for State Registration, Cadastre and Cartography ([ROSREESTR](#))

General questions: info@racurs.ru

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Editorial

Announcement about Rachapudi Kamakshi Memorial Geospatial Young Scientist Award is in this issue. This is the tenth year and last date is 31 October and age limit 35 yrs. A highly encouraging effort.

Usual column on Mohan's Musings covering this time, concluding part of ortho mosaic, is quite informative.

A research article on UAV based mapping for cadastral surveys is informative and shows a new alternative to large scale surveys

Under students forum, readers will find some items of special interest to student community particularly "Google My Maps" Also read and enjoy about maps in daily life !!

The article on globe making, including the story behind it, is very interesting. Skills and research for perfection have been highlighted.

The article concerning citizen's perception about socio-environmental issues that impact their daily lives will be of interest to all.

This year, NASA is celebrating the 50th anniversary of the first crewed mission - Apollo 11 - landing on the moon. Indian lunar mapping project is successfully launched and lunar images are being captured. News item on this is included with compliments to ISRO for the success of lunar mapping project.

After the recent developments in Kashmir, the map of India with a turban on top copied from internet is very appealing.

The article on the use of images taken with smart phone camera for mapping shows the potential of emerging trend.

Views of the authors of articles may not be shared by editors and members of Maps Today.

GIS Principles and Practices

By **GS Kumar**, former Director, Survey of India and Managing Editor, GIS India, Editor, Maps Today

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15 – 16 October 2019, Hyderabad

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---- Editor **G.S. Kumar**

Mohan's Musings

MOSAICS Concluding part

Let us continue our discussion on preparing the orthomosaic using digital aerial photographs. In the previous musing, we identified the important steps in mosaicing process and now we will deliberate their significance.

1. Organise the photos in a folder. Weed out the ones with extreme overlaps or no overlaps. As the images contain geotags (coming from direct georeferencing instrumentation), analyse the ground coverage / foot prints for adequate overlaps. Image pyramids are built at this stage to provide a preview of the rough mosaic.

2. Exercise the options for no-data value, seamline option, feathering distance, colour matching, resampling technique.

We will see the significance of these options and more about processing now.

No-data value: Any image, after geometric corrections, gets transformed into a parallelogram-like shape. The image data is surrounded by non-image data – appearing mostly dark. This dark region data needs to be ignored while mosaicing. The digital number for this no-data can be 0 or -9999 or any other as assigned by you or the software. Sometimes, no-data can represent noise or corrupt image data as well. You need to tell the mosaicing software that it needs to identify and ignore the no-data while generating footprints and later mosaicking.

Colour or tonal matching: The images making a mosaic are very likely obtained in varied lighting conditions. Hence, some of them are bright, some dull and some with good contrast. To make appear the mosaic acceptable, it is necessary to modify the histograms of the images. Towards this, identify one image having good contrast as the reference. The histograms of the remaining images get normalized with that of the reference image. At the end of histogram matching, all the histograms appear approximately same. This is a two-step process – collect the histograms and then match them. It needs to be done for B&W or colour images as well. The process is also popularly referred as colour correction.

Seamline: Heard of seamless garments? Seamless clothing is created with a single and continuous knitting process which eliminates seams in the manufacturing process. Garments such as socks are seamless in nature. They look certainly elegant. During mosaicking too, it is our endeavour to stitch the images in such a way that seams are not noticed in the end product. Towards this, we need to define *seamlines*.



A seamline is the line along which overlapping images will be mosaicked. They help make individual image boundaries less conspicuous. They are also helpful when overlapping areas have significant differences in feature appearance – especially in tone and texture. For example, a highway appears nearly consistent in overlapping images but not an agricultural field. The wind might have swayed the crop even though all photographs are taken on the same day.

Mosaicing tools can generate the seamlines automatically based on the input statistical criteria. If this is not acceptable, do it manually – defining the seamline cutting across homogenous features such as wooded areas, roads, foot-tracks etc. Basically, the idea is to dissolve the seamline in the finer details. But the client may like to verify the seamlines at his end. In such a requirement, you will deliver the seamlines as vector files so as to enable their overlay on the mosaic and verify the geometric continuity across the seamlines.

Feathering: Feathering results in 'soft edges'. Creating a soft edge around a seamline is a nice way to blend images. Feathering blends the pixels on both sides of the seamline by carefully transitioning from one scene to another. The distance over which feathering is desired to be carried out is specified usually in terms of number of pixels. A longer distance, obviously, results in gradual and less-conspicuous transitioning.

(In the context of lipstick application, feathering has a disastrous connotation. Google to know how not to!)

Resampling technique: Except the Nearest Neighbour (NN) technique, all other modify the histogram of the parent image. This needs to be carefully exercised based on the end-use of the mosaic. If the mosaic is forming a base layer for topographic mapping, Cubic Convolution (CC) is fine. If you are using it for supervised classification for estimating crop acreage, you desire the original digital numbers (DNs) unaltered and hence you opt for NN technique.

Masking: Lastly, extract the region of interest with the defining polygon – such as an administrative boundary or watershed basin. This is a raster trimming operation using a vector input.

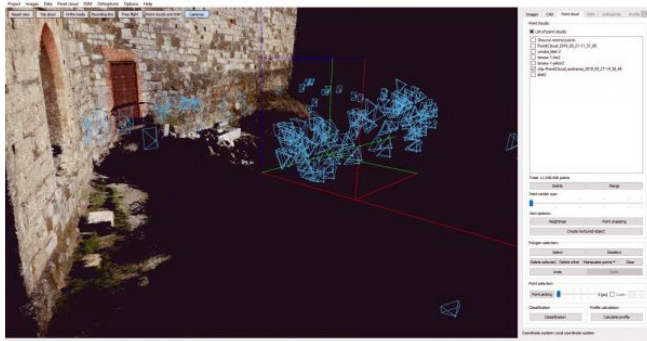
Finally, display the raster mosaic, overlay the seamline, pan across and satisfy yourself about the quality before delivering it. *Bingo!*

Combining Smartphone and TLS in Ljubljana Castle Survey

06/08/2019

The renovation of Ljubljana Castle – a key landmark of the capital of Slovenia – has been an ongoing project since the 1960s. The latest renovation occurred at the castle’s wine cellar and its outer patio. A 3D model of the patio was made and further used for the visualization of patio. Recently, the castle’s outer wall and terrain was surveyed with a terrestrial laser scanner (TLS). To compare results, a point cloud using 3Dsurvey was computed.

The project was carried out by the Department of Geodetic Engineering, Faculty of Civil and Geodetic Engineering at the University of Ljubljana. The renovation is financed by Ljubljana Castle Public Institution and carried out by the architectural studio Ambient.

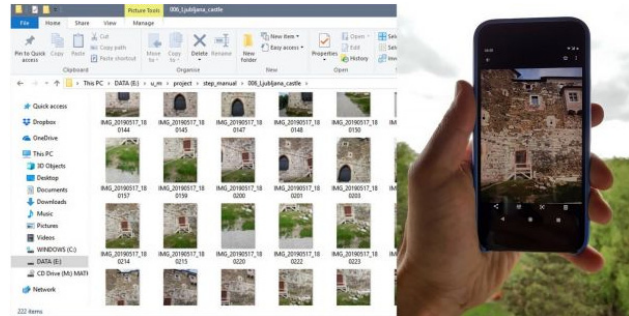


11,887,764 of point cloud points were collected.

Smartphone imagery

As this part of the castle is not suitable for aerial images, ground photos were taken with a Google smartphone, at different vertical angles, with at least a 70% horizontal and vertical overlap. To reach a point cloud completeness, images had to be taken from different angles as the wall is in the shape of the letter L.

All 205 images were taken with a focal length of 5mm. For comparison, laser scanned point cloud was used for the extraction of ground control points (GCPs). Suitable wall details as well as the porthole were used for sparse point cloud orientation. The surveying crew achieved spatial accuracy better than 12mm.



The Ljubljana Castle wine cellar patio was mapped with a smartphone.

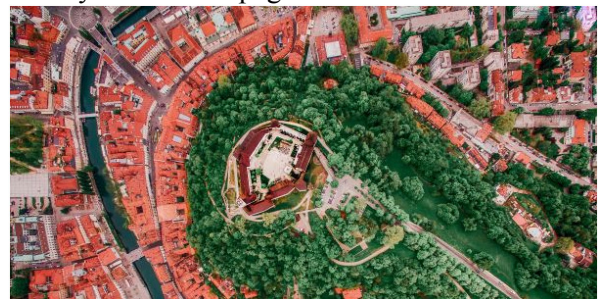
CAD tools and point cloud technology

3Dsurvey CAD tools were used to outline the cellar’s doors and doorstep. A 3D model was georeferenced to point the cloud’s location using exported CAD lines. The main goal of this task was to provide a background for the patio visualization and for this reason, the 3D model was converted to a point cloud.

The castle’s point cloud was displayed together with the one made for the patio. As point clouds were of high density, they could be used as a realistic background for visualization purposes.

To visualize the project better, both the 3Dsurvey point cloud and the one made with TLS were combined. A further detailed view shows slight differences of 2 cm in the location of point clouds. Considering that the 3Dsurvey point cloud was computed from images, taken with smart phone camera, results show great potential for visualization purposes.

For a complete overview of the project, visit 3Dsurvey’s showcase page.



Aerial view of Ljubljana Castle, situated on Castle Hill above downtown Ljubljana, the capital of Slovenia. (Image courtesy: Ljubljanski grad)

Have Students Collaborate on Maps with Google My Maps

MARCH 28, 2018



Mapping is a necessary skill in any social studies classroom. As a teacher, I've found that when it comes to mapping, collaboration is tough. Giving a map to a group for collaboration usually means one-

two students doing the work of mapping, while the remaining two-three students sit idly and have side conversations. This problem makes collaborative mapping difficult to do as a learning activity. Fear no longer, welcome to the world of Google My Maps.

Google My Maps, what is it?

Google My Maps is an online mapping tool, that allows students to create and share their own maps. This tool allows students to drop pins at certain locations throughout a map and provide a description of that pin. Students can add different layers for different regions or topics. Other features available to use in My Maps are drawing a line between multiple locations, adding directions to get to a location, and measuring the distance between locations. Students can all be on the same map simultaneously, collaborating on locating different locations to drop pins on or measure.

Using MyMaps in the Classroom



My Maps is best for having students share and work on the same maps together. The map on the left is an example of a My Map that students collaborated together on as a part of station rotation group in my blended learning classroom. Students collaborated together to map out the significant regions of the Middle Ages to Europe and areas that had an influence on



Caleb Allen
Middle School Social Studies and Language Arts Teacher
Cincinnati, OH
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Europe. I've also used My Maps in the classroom to map out areas of cultural significance in Ancient Civilizations. Students in my sixth-grade class collaborated on different layers of a My Map to map areas around the world today that show the cultural impact of Ancient Civilizations. My goal is to use My Maps in a collaborative setting more often to plot out significant historical regions of the past but to also connect areas of historical significance in our modern world.

Lessons learned using MyMaps in the classroom?



My Maps is a relatively new feature to my classroom, but I have already learned a lot in my first few attempts. In my first go around I learned a lot. First thing, in order to have student collaborate more effectively, I should have had students define their roles in the group explicitly. I didn't do this,

and the result was many students dropping pins in locations that were already previously pinned.

Second, my groupings were too large for effective collaboration. Great collaborative groups are between 4-5 students, I had 7-9 students in a group. This was not effective in getting students to meet the desired results. Keeping the collaborative groups smaller will allow for more defined roles throughout the task and a better learning experience for the students.

Lastly, Google My Maps can be posted to your Google Classroom stream from your Google Drive, just make sure your directions are very clear. Give students very clear directions when posting this to your Classroom

Contd....16

Bellerby & Co. Globes

After a two year search for a globe for my father's 80th birthday present I was faced with a choice of a modern political globe (albeit frequently available with a generous dose of sepia colouring).. very fragile expensive antique models, which you can't really use on a daily basis... or trying to make my own.

So the original plan, hatched in a Kings Cross pub was to make just two, one for Dad, one for me. It assumed it would probably take three, maybe four months... and cost a few thousand pounds. After all how difficult can it be to make a ball and put a map on it?

So firstly I had to license a map. The one I settled on was from a reputable source... it had incorrect capitals, most of the names in the Middle East were either rubbish or incorrectly spelled or positioned. Don't let me start on the Aral Sea. That took at least 6 hours a day for about a year. In the end we changed everything and these days we have two full-time cartographers working from our studio.



Next I found a friend to write the programme to morph a rectangular map into 'gores'- the triangular shapes that fit onto a sphere. I offered him a globe as a bribe. Easy. Even better his job was far from taxing so a month, two at most. Three days later he was re-assigned to Kabul (with a bodyguard and Uzi as company). So that took over a year to complete!

Then make a sphere. I thought ... at least I can rely on a manufacturer to make a perfect mould. This was the beginning of my introduction to the world of tolerance. I found several companies prepared to make a 50cm sphere mould, but the moulds were neither round, often had plateaus on and were far from accurate. Now the actual

globe is not exactly round, but that's not really the point. In the end we have relied on Formula 1 fabricators to make our moulds. The reason being that when you have a tolerance (error) on a sphere, you might as well multiply this by Pi (3.14159 etc etc) ...if you can imagine sticking 24 pieces of map on a sphere and each one is 0.1mm too small you have a 2.4 mm gap to contend with.

Then there are other little treasures. How for instance do you balance a ball so that when it spins it comes naturally to rest rather than swinging drunkenly like a weighted ping pong ball? Later on... how do you get a ball balanced with lead weights through customs? You would have thought that if customs detected heavy metal, that they might possibly use a geiger counter rather than a hammer to establish the contents?

There just seemed little point in spending two years researching a project only to produce a poor quality finish.

Goring the globe (applying the map) was something that took eighteen months to perfect. The difficulty I had was that none of the current breed of globemakers, and I mean ALL the current globemakers and copy artists/model makers are producing anything close to perfect globes. Latitude lines that don't match is a personal passion. There are makers who overlap gores to the extent that they wipe out entire countries. There are even some who in order to prevent the paper ridging cut out little triangles of map. How is it possible to do it so badly? Some makers even have latitude lines that look like they have been drawn with a ruler after the map has been pasted on they are so straight. There just seemed little point in spending two years researching a project only to produce a poor quality finish.

It is a thrill that in the past few years our globes are used in Hollywood movies and for TV productions worldwide. We have had the pleasure of working with established artists.. but more importantly our globes are enjoyed by many customers around the world. The comments on our testimonials page are entirely unsolicited and are a source of great pride.

Now it is me along with a small team of highly trained Globemakers. Together we create the high quality, hand made globes that Bellerby & Co. has come to be

recognised for. From the wooden and metal bases, to the artwork, the painting and map-making, each piece is expertly crafted using traditional and modern globe-making techniques, and is lovingly produced in our North London studio; each piece is an individual model of style and grandeur and the larger globes are works of art in their own right.

The collection is ever increasing, with the popular mini desk globe that spins 360 degrees in a fluid motion by hand being our favourite. Watch a video here.

As well as the models displayed online, we undertake commissions of all kinds. Each globe is made bespoke to order so it is a great opportunity to add personalisation like hand engraved messages, edits to the map or artwork. A bespoke globe is an excellent way to commemorate a special occasion or journey.

Alternatively a special range of the 22cm Mini Desk Globes and our 36cm Livingstone globes can be viewed at Harrods, Knightsbridge and a bespoke collaboration can be seen at Linley.

Check out the video section for a glimpse into our London studio and the press section to see recent interviews.

For any further information on our products do not hesitate to call our office or send an email.

And for a glimpse into daily life in the studio check out our instagram.

Please note that the studio is not open to the public day to day and we do not have a store or keep ready to buy keep. All globes are made bespoke to order, to arrange a meeting contact jade@bellerbyandco.com.





Photos via Sebastian Boettcher for Freunde von Freunden & Paul Marc Mitchell.



Geopedia

Information and knowledge about Mapping & GIS
 The Team of GeoMap Society (GEMS) has decided to start a web portal site under the name of Geopediasociety.com. Main functions are:

- Searching articles/News topic-wise stored in alphabetical order
- Providing up to date information
- Free access
- Students Forum with information on training and career opportunities
- On-line chat with experts on any doubts
- GIS related events

Readers can access the webportal with limited, but increasing functions

<https://geopediasociety.com>

Suggestions/comments may be mailed to

geomapsociety@gmail.com

Land Records

According to McKinsey Global Institute's report, effective use of geospatial and digital technologies in India's land records management has the potential to unlock \$34.45 billion. This is almost equal to the FDI equity inflows into the country between April and December 2017, making India one of top foreign investment destinations in the world

Maps in Daily Life

How To Optimize Google Maps in Your Daily Life

<https://simiancreased.wordpress.com/2013/08/14/how-to-optimize-google-maps-in-your-daily-life/>

I believe you all know what Google Maps technology is. There are several functions out there that will help you out in your daily life. I currently use HTC One with Android JellyBean 4.2.2 as my daily smartphone to help me several things. Google Maps have such functions like traffic, navigation, places or else. Traffic jam is such - my daily problem - when to go outside, especially in Jakarta where I lived in.

The new Google Maps app has a simplified interface that focuses on the map

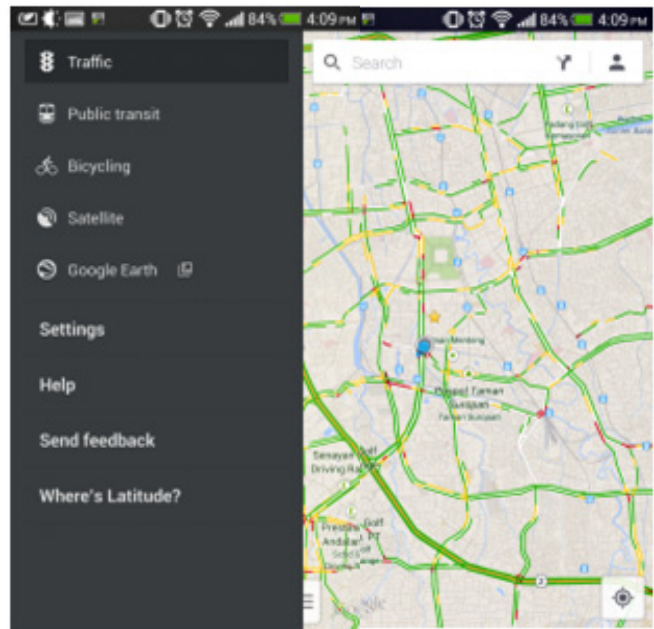
Google Maps has recently updated their mobile application version for android. The new Google Maps app has a simplified interface that focuses on the map. It has a lot of things in common with the new Google Maps for desktop, including the missing features. For now, there's no support for My Maps (it will be added later), many layers are missing, Labs features are no longer available. Map caching is now a hidden feature: type "OK maps" in the search box and the app will pre-load the map you're currently viewing. Google Latitude has been discontinued and replaced by a Google+ feature. In my limited testing, the app was pretty slow and laggy, so Google still has some work to do to optimize the app.

Traffic

I use Google Maps to locate the traffic as my daily life. There are 3 types of traffic history, Green (no traffic), Yellow (normal traffic), Red (high traffic). You can locate new route if you know where the traffic is and reduce time spent. To enable this awesome tools, use your Google Maps – push the menu button on the left down (marked by 3 horizontal lines) or swipe-right to show the menu – select the "Traffic". Your maps will likely show some colors on related road, there you go!

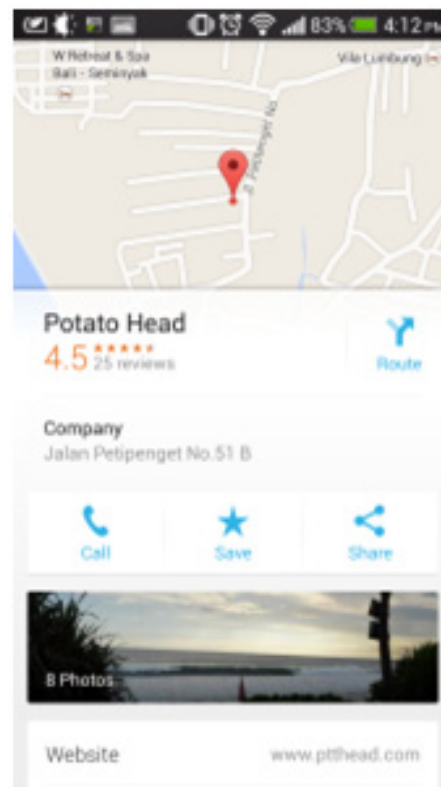
Places

You may also find some places to go and have it reviewed first to verify whether it is the place you are going to or not. Well, just use the Google Maps search bar, search your places. Some places have included their store details, you can directly route to the place, make a direct phone



Google Maps - Traffic History

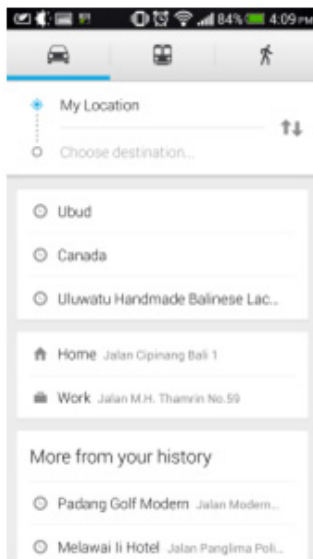
calls, see others review, pictures, save the place for future, or even want to share to others.



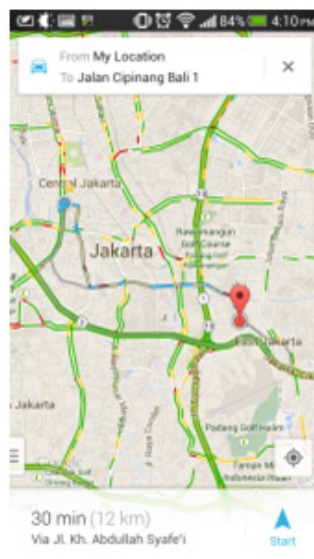
Google Maps – Places

Navigation

This is the most precious apps ever for navigation. Google Maps could make route to some places and for recent version, Google has updated their android version to run a turn-by-turn navigation with voice direction. This what makes the apps so special. You just put the place you want to go and select “Route”. Another way to go a place is by selecting a route *icon* in the search bar that will directly take you to a form “From – Choose Destination” where from values is default by ‘My Location’. This section also provides you the recent activity of what places you were going or searched for, your home and work location, and also your saved places. Google Maps also provide you the most convenient way to get the location, by car, public transportation, bicycle, or even walk.

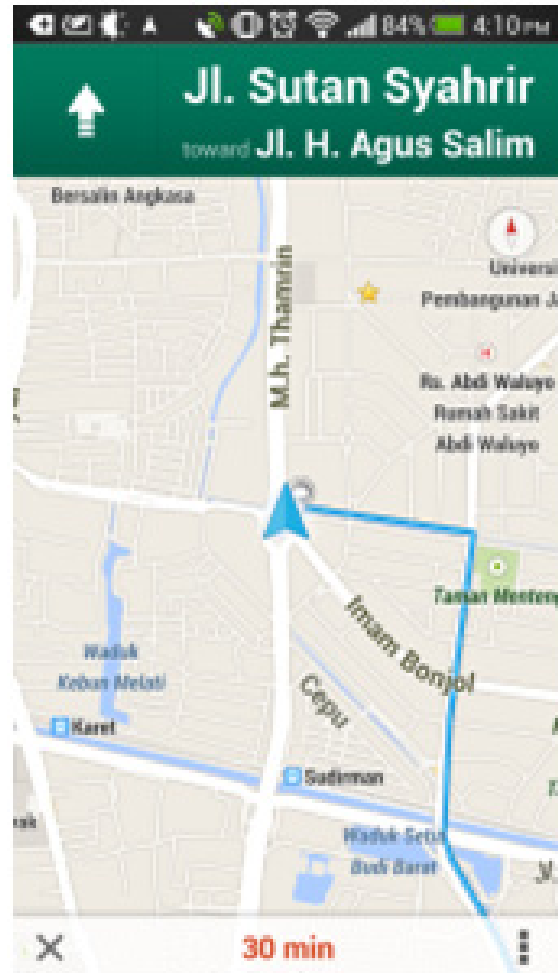


Google Maps - Route



Google Maps - Route 2

When you have selected the route, the maps will show you an overview to get there by giving you an information of estimated travelling minutes, approximate distance, route ways. You can swipe to right on the information given to select another route options. Google Maps will give you the most convenient way to get your place by estimating the traffic condition and selecting the best route for you. Just press “Start” button to start the turn-by-turn navigation. But, you need to enable the GPS services by ticking the ‘GPS Satelites’.



Google Maps – Navigation

There are some more awesome tools inside, like “Google Street View” that will show you some images like you are standing on that road. You can also locate where you currently are by clicking the round button on the bottom right. Zooming is also very easy by pinch to zoom or double tap hold swipe up or down. And also the the 3D view by using your 2 hand hold and scroll down. Enjoy!

RELATED ARTICLES

- Navigating the changes to Google Maps at I/O 2013 (reviews.cnet.com)
- Review: Google Maps 2.0 comes to iOS, reroutes us from Apple Maps(digitaltrends.com)

GPS application-saving trees

How Scientists are Saving Trees with Gaia GPS (And How You Can, Too)

<https://blog.gaiagps.com/how-scientists-are-saving-trees-with-gaia-gps-and-how-you-can-too/>

How hard is it to steal a tree? According to a one study, it's not as difficult as you might think. The study, conducted by the United Nations Environmental Program and INTERPOL in 2012, found that 30 percent of finished wood products contain timber illegally poached from protected zones. That includes species like western redcedar, Alaskan yellow-cedar, coast redwood, and bigleaf maple.

The good news: Adventure Scientists is using Gaia GPS to build geo-referenced databases authorities can use to trace lumber and track down the criminals. And if you're an expert on getting deep into the backcountry, they need your help.

About Adventure Scientists

Adventure Scientists, a nonprofit based in Bozeman, Montana, draws on the resourcefulness and backcountry skills of outdoor adventurers to organize citizen science efforts across the world. It's not just a feel-good volunteer activity, either—Adventure Scientists volunteers provide high-quality data. That data influences cutting-edge studies and real-world change.

Past projects have included freshwater and saltwater microplastics surveys (which influenced the European Union's recent landmark ban of single-use plastics), wolverine and lynx population tracking, and antibiotic resistance studies. For many of these projects, volunteers use Gaia GPS to navigate in the wilderness. They also use the app to leave annotated waypoints so scientists can track exactly where the samples came from.

Why Conservation Needs Citizen Science

Conservation biology requires a lot of legwork. Because it takes hundreds of data points for a study to be thorough and conclusive, data collection can take a long time. There simply aren't enough scientists to go around. That means research progresses slowly, all while environmental problems worsen and populations of

threatened species dwindle.

Fortunately, a lot of the work that needs to be done involves trekking out into the field, accessing remote fields and forests, spending time in isolated landscapes far from civilization—all things the outdoor recreation community is already doing. Adventure Scientists leverages that community to turn weekend warriors into the conservation army that biologists have always dreamed of. In this way, citizen science speeds up the pace of scientific discovery.

Saving Trees with Gaia GPS

Adventure Scientists' Timber Tracking Project, now entering its second year, aims to collect thousands of genetic and chemical samples from important tree species across the country. Volunteers are trained to identify the species involved in the study. When they find one, they take samples of the leaves, cones, wood, or sprouts and record a Gaia GPS waypoint. That waypoint can easily be shared with other volunteers or exported to the project file. Then, each tree sample is analyzed, and added to the appropriate genetic or chemical database.

Ultimately, forestry officials will be able to test wood from lumber shipments of bigleaf maple, western redcedar, or Alaska yellow-cedar, and compare those samples to the database. If the timber's genetic or chemical makeup matches that of a sample collected in a protected area, officials will know it was illegally harvested.

For coast redwoods, Save the Redwoods League will compare the genes of each tree sample with characteristics of the site where the sample was taken. The study should help scientists understand the function of genetic variation within the species. That understanding will help guide future conservation and restoration efforts.

You can read more details about last year's successes with bigleaf maple here, and more about how to sign up to help with this year's project here.

Obituary

It is learnt that Mr. Gulab Chaudhury, Retd. Director, Survey of India expired in June 2019. He was a friendly and jovial person known to many professionals in the field of Surveying & Mapping. I share imilar feelings as expressed by his colleagues. Some emails are reproduced below.

GS Kumar, Editor, Maps Today

From: **Gurbaksh Oberoi**

<gurbakshsoberoi@yahoo.co.in>

Date: Sun, Aug 11, 2019 at 6:35 PM

Dear friends,

I have just received a sad message from my good friend Shri A.K.Sanyal, that Shri Gulab Chaudhury is no more. He also informs that he passed away in sleep in June, 2019.

I am very sorry to receive the message of his untimely death. i have known him for a number of years. A good friend and colleague with lot of fun and laughter.

May God give rest to his soul and strength to members of his family to bear this irreparable loss!!!

His Mobile No. available in my records is 9471223099.
yours in grief, GS Oberoi.

On Sun, 11 Aug 2019 at 21:01, namasivayam g <hydstil@yahoo.com> wrote:

Dear friends,

It is really a very sad news. We ,(1966-67 batch) all got training together, starting at Nandi Hills Karnataka, Bangalore, later shifted to Hyderabad.

Myself, Mr R K Jayavelu, and Mr Thomas hired a house in Ameerpet, Hyderabad, and stayed together for few months during our training time. The stay with him and the happy days we spent together could not be forgotten and still remains as a GREEN MEMORY in our life.

I pray the almighty to rest his soul in peace and give the family members sufficient strength to bear with the irreparable loss of his demise.

G Namasivayam

Very very sad news.

He used to be very active and jovial ...

We were neighbors in Hathibarkala Estate Dehradun in 1978.

May God provide strength to family members to bear the irreparable loss of his departure.

SP Goel.

Jagjit Ahuja

Aug 13, 2019, 12:07 PM (22 hours ago)

Very sad . We came to SoI almost same time. I have very good memories of working together .

These unfortunate happenings remind us that we are in the queue. Now the only desire is to die peacefully without any ailment.

May his soul rest in peace.

Kishan Gopal Behl

Aug 13, 2019, 2:53 PM (19 hours ago)

Very sorry to learn about passing away of Mr Gulab Chowdhary. He was very energetic and always created humour out of drab office work making the atomsphere lively, though a hard task master. .I met him last at Bhubanesh when l visited as DSG from SGO and later as member of High powered National commission on land reforms. Both the times he looked after me as very good friend. I will miss him for long.

May his soul rest in peace and God grant strength to the family to bear this great loss. Kindly convey our condolences to all concerned.

Mrs & Brig K.G.Behl

9411101130

Dehradun

Sad news. I met him rather late in late eighties when he was in Bhubaneswar. We were in touch and I remember his affable nature. May his soul rest in peace

regards

Siva Kumar (Maj Gen. Dr.)

Legal Challenges to Mapping in India #1 - Laws, Policies, and Cases

Adya Garg , law student at West Bengal National University of Juridical Sciences, Kolkata and

<https://cis-india.org/.../legal-challenges-to-mapping-in-india-1-laws-policies-cases>

3.3. J. Mohanraj v Google and Others

..... another pertinent case is the 2008 judgment by the Madras High Court in J. Mohanraj v (1) Secretary To Government, Delhi; (2) Indian Space Research Organisation, Bangalore; (3) Google India Private Limited, Bangalore . A writ petition was filed by Mohanraj seeking a complete ban on Google Earth and ‘Bhuvan’; mapping initiatives by Google and ISRO respectively [48].

The petition was allegedly filed in public interest considering the security apparatus of Indian Government along with the threat posed by the terrorists. The petitioner claimed that the initiatives such as Google Earth used high quality satellite imagery to display bird’s eye view of various establishments including minute details and were bound to cover defense establishments and sensitive areas, posing a threat to Indian security. Dr. A.P.J. Abdul Kalam’s speech was referred to indicate his views against such open creation of geospatial data. The provisions of the NMP was highlighted and it was alleged that such mapping practices violated the individual rights of a person under Article 21 of the Constitution. Further, it was claimed that such practices could only be taken up by SOI and were outside the purview of private organizations.

though complaints and cases are filed against such activities, no concrete consequence emerges from the same

However, the Court held that the petitioner was unable to produce any specific “Guidelines/Rules/Law laid down by the Central/State Governments, prohibiting the private organisations or any other individuals to Interactive Mapping Program, covering vast majority of the Planet”. Since the court could only interpret existing provisions and not lay down guidelines, passed the judgment against the petitioners.

From the above explained incident it seems that the NMP per se does not refrain creation of mapping data by agencies other than SOI. The centre of the conflict seems to lie with the interpretation of the policy by SOI claiming itself to be the exclusive agency entitled to map data. Hence, often though complaints and cases are filed against such activities, no concrete consequence emerges from the same. Further, the courts have also neglected the grievance of the issue and given ambiguous judgments in most cases. Thus no judicial sanction or opposition to the SOI’s guidelines exist till date often allowing SOI to continue with following its own version. While these cannot be termed as a solution, they definitely indicate towards the root of the problem.

More than one provision under the SOI guidelines indicate towards the arbitrary abuse of power

Conclusion

It can be concluded from above compilation of legal provisions and incidents that it is perhaps SOI’s interpretation to NMP that gives rise to exclusive authority to map geospatial data and not the policy per se. The objective of the policy clearly advocates for promotion of the use of geospatial knowledge and intelligence. More than one provision under the SOI guidelines indicate towards the arbitrary abuse of power. First, a provision regarding ‘Settlement of disputes’ has been included in the guidelines. Secretary, Department of Science & Technology has been vested with binding decision making powers in case of a dispute on the applicability or interpretation of the guidelines between the SOI and any other person. Thus, instead of a judicial forum, an executive authority has been vested with quasi-judicial powers. Such a dispute resolution mechanism cannot be considered as devoid of bias towards the governmental agency, hampering fair and equal justice. Second, SOI assumed the power of mapping data but under the guidelines considers itself devoid of complete responsibility for the loss caused to any person on account of failure of proper dissemination of data. Third, the SOI

has reserved the right to add, delete, modify or amend every provision of the guidelines at any time without assigning any reason or notice.

SOI assumed the power of mapping data but under the guidelines considers itself devoid of complete responsibility for the loss caused to any person on account of failure of proper dissemination of data.

While depiction of wrong boundaries has been specifically been criminalized and can be accepted as symbolic of sovereign hold over contentious territorial areas, it hardly fulfills a security purpose other than acting as a proof to the international community. The incident regarding Mapathon, on the other hand, though did not result in penal consequences towards Google, seem counterproductive in the first place for asking for a ban on increase of geospatial resource data. Considering the same, prudence demands that India also adopt policies and measures that are more peaceful and accommodating in nature such as resolving territorial matters by talking out with Google and other agencies. The current and proposed stringent penal provisions only act as disincentivising measures for geo-spatial agencies to map India, which is not the motive sought to be achieved by the bill.

However, the interpretation of the policy cannot be blamed alone for restrictions such as depiction of VAs and VPs have been specifically mentioned in the policy. Above mentioned policies and guidelines have often been criticized for being overly restrictive in nature and a consequence of colonial hangover. In times of crowdsourcing of mapping data, the need of the hour exist in critically analysing the existent policies and their interpretation. The same is especially so in the absence of a high quality digital version of the correct boundary of India. While a map in PDF form has been put up by Survey of India, the same cannot be converted to digital form to be complied with or used to resolve territorial disputes of detailed nature. This makes it absolutely impossible to completely comply with the Indian version of the boundaries without a proper resource acting as a comparison check. The need of the hour is for the Government to release less ambiguous and specific details as to what it considers to be outside the scope of private mapping and the correct boundaries along with a less stringent policy framework so that India can protect its security, sovereignty and integrity while promoting creation and dissemination of geo-spatial data.

Chandrayaan-2



update: Lunar Orbit Insertion Aug 20, 2019

Lunar Orbit Insertion (LOI) maneuver was completed successfully today (August 20, 2019). The duration of maneuver was 1738 seconds beginning from 0902 hrs IST. With this, Chandrayaan-2 was successfully inserted into a Lunar orbit. The orbit achieved is 114 km x 18072 km.

Following this, a series of orbit maneuvers will be performed on Chandrayaan-2 spacecraft to enable it to enter its final orbit passing over the lunar poles at a distance of about 100 km from the Moon's surface.

Subsequently, the lander will separate from the Orbiter and enters into a 100 km X 30 km orbit around the Moon. Then, it will perform a series of complex braking maneuvers to soft land in the South polar region of the Moon on September 7, 2019.

The health of the spacecraft is being continuously monitored from the Mission Operations Complex (MOX) at ISRO Telemetry, Tracking and Command Network (ISTRAC) in Bengaluru with support from Indian Deep Space Network (IDSN) antennas at Bylalu, near Bengaluru. All the systems of Chandrayaan-2 are healthy.

The next Lunar bound orbit maneuver is scheduled tomorrow (August 21, 2019) between 1230-13:30 hrs IST.

Student Forum Contd.....7

stream to allow students a clear vision of what the purpose of this learning activity is.

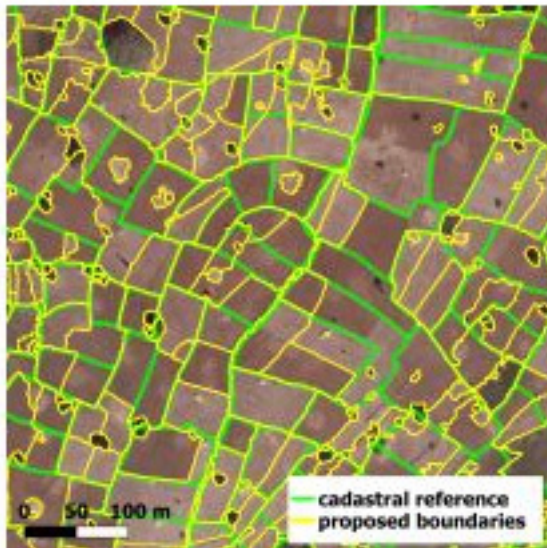
Using My Maps isn't only for a social studies classroom either. Teachers can use My Maps for measuring out distances between multiple points in math class. Use My Maps in science to plot points of different climates or trends in weather. Reading an interesting novel in class? Have students map out places in the novel and describe the significance of those regions. This tool allows students to connect learning across multiple subjects.

In conclusion, Google My Maps is a great way to have students collaborate during the mapping process. Not only does this application have use in the social studies classroom, but across multiple subjects as well. Google My Maps is an excellent way for students to connect regions on a map to real-world learning and application. I hope that you give this application a try! Drop your thoughts on My Maps here in this **Padlet**, or share how you've used this tool best in your classroom.

Towards Cadastral Intelligence? - Extracting Visible Boundaries from UAV Data through Image Analysis and Machine Learning

Sophie Crommelinck, Mila Koeva

<https://research.utwente.nl/en/publications/towards-cadastral-intelligence-extracting-visible-boundaries-from>



The inability to access formal land registration systems fosters insecure land tenure and conflicts, especially in developing countries. This calls for low-cost and scalable mapping solutions aligning with fit-for-purpose land administration. The work presented in this article supports the UAV-based mapping of land tenure inspired by state-of-the-art approaches from remote sensing, geoinformatics and computer vision. The guiding question is how to develop an automated approach that promotes the paradigm shift towards cadastral intelligence which integrates human-based expert knowledge with automatically generated machine-based knowledge.

Cadastral mapping contributes to the creation of formal systems for registering and safeguarding land rights. According to the World Bank and the International Federation of Surveyors (FIG), 75% of the world’s population do not have access to such systems. Furthermore, they state that 90 countries lack land registration systems, while 50 countries are in the process of establishing such systems. In these countries, cadastral mapping is often paper-based (Figure 2) or delineated from partly outdated maps or low-resolution satellite images which might include areas covered by clouds.

The definition of boundary lines is often conducted in a collaborative process among members of the communities, governments and aid organizations. This process may be referred to as ‘community mapping’, ‘participatory mapping’ or ‘participatory GIS’. Numerous studies have investigated cadastral mapping based on orthoimages derived from satellite imagery or aerial photography, and recently also from imagery from unmanned aerial vehicles (UAVs or ‘drones’).

The average geometrical precision is shown to be the same, or better, compared to conventional terrestrial surveying methods. As a consequence, UAVs are increasingly proposed as a tool for fast and cheap spatial data capture enabling the production or updating of cadastral maps.

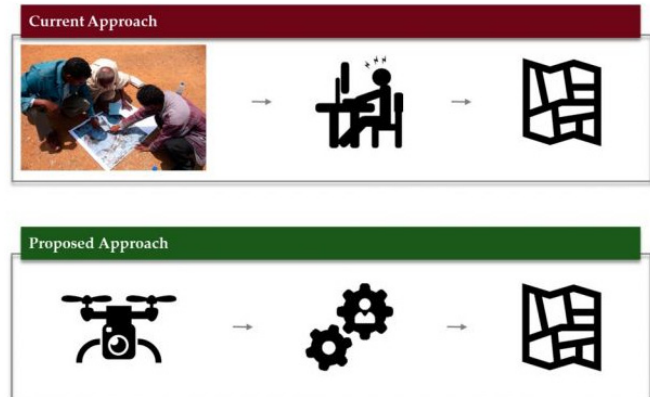


Figure 1: Improving current indirect surveying by coupling high-resolution UAV imagery with automated feature extraction for cadastral mapping.

Visible boundaries

Cadastral surveying techniques can be divided into (i) direct techniques, in which the accurate spatial position of a boundary is measured on the ground using a theodolite, total station or global navigation satellite system (GNSS), and (ii) indirect techniques, in which

remotely sensed data such as aerial, satellite or UAV imagery is used (Figure 3). Indirect techniques rely on the existence of visible boundaries demarcated by physical features such as buildings, hedges, fences, walls, roads, footpaths, crop types or water bodies. These features can be extracted by means of image analysis, as demonstrated by studies in remote sensing. Visible boundaries are assumed to make up a large portion of all cadastral boundaries.

Automated cadastral mapping

To investigate the potential of using UAV data coupled with image-based automatic feature extraction for land tenure mapping, a tool was designed that facilitates the delineation of visible cadastral boundaries from UAV data to support indirect cadastral surveying. In contemporary indirect surveying approaches, the operator creates nodes by clicking along a boundary. In the proposed approach, the operator has multiple options to create a boundary making use of the automatically extracted features along visible boundaries. One option consists of selecting nodes from a set of proposed nodes that are then automatically connected along visible object outlines derived from the UAV data. A machine learning approach is applied to learn which object outlines demarcate cadastral boundaries at the specific local scale.



Figure 2: (a) Paper-based cadastral data storage in Kajiado (Kenya), and (b) a paper-based map used in local land administration.

Automated delineation workflow

- (a) Image segmentation delivers closed contours capturing the outlines of visible objects in the image. Multiresolution combinatorial grouping (MCG) has shown to be applicable to high-resolution UAV data and to deliver accurate closed contours of visible objects.
- (b) Boundary classification aims to learn which lines from (a) are useful for cadastral boundary delineation. This is achieved by training a machine learning algorithm that takes into account the lines and their context. After being trained on a set of lines, it can then predict a boundary likelihood for lines from (a) that represents each line's usefulness for cadastral mapping.
- (c) Interactive delineation allows a user to start the actual delineation process: the RGB orthomosaic is displayed to the user, who is asked to create final boundaries making use of the automatically extracted boundary features and their boundary likelihoods. (c) is implemented as a publicly available QGIS plug-in (BoundaryDelineation).

Challenges

The proposed delineation workflow, which is entirely open source, has been evaluated on different UAV data, e.g. from Rwanda, Kenya, Germany and France. Given the complexity of cadastral boundaries, automating boundary delineation remains challenging; the variability of objects and extraction methods reflects the problem's complexity, consisting of extracting different objects with varying characteristics. These circumstances impede the compilation of a generic model for a cadastral boundary and thus the development of a generic method. No standardized specifications exist for boundary features, and boundaries are often not marked continuously and/or maintained poorly.

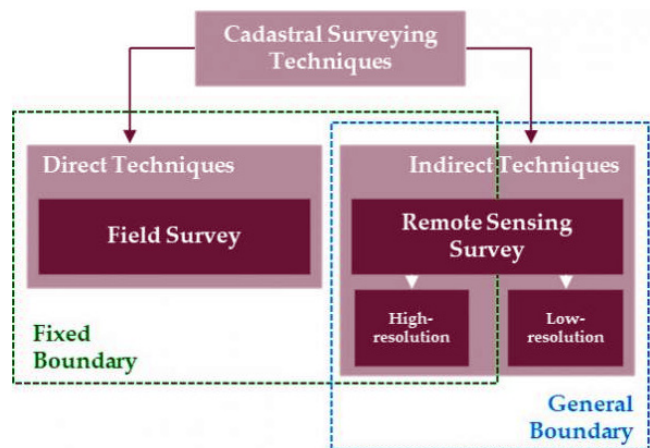


Figure 3: Direct and indirect techniques for cadastral surveying.

Ongoing work

The authors are currently revising the workflow steps (b) boundary classification and (c) interactive delineation. For (b), they are investigating a deep learning based approach, and for (c), they are improving the usability and effectiveness of the plug-in by adding further delineation functionalities, speeding-up the processing and allowing the creation of polygons.

Extractable boundaries

To further develop automated cadastral mapping in indirect surveying, the authors suggest considering the extractable boundary rather than the visible boundary alone. Instead of focusing on the visible boundary comprising of outlines of physical objects, automated cadastral mapping should focus on the extractable boundary that incorporates local knowledge and context. Local knowledge helps in identifying boundaries, e.g. between two beacons. Context helps when closing an open gateway in a fence as a boundary, for example. This information is not inherent in the concept of the visible boundary, but it is extractable from remote sensing imagery.

Figure 4: Boundaries derived with the described approach overlaid on cadastral reference data from Ethiopia. For these automatically generated boundaries, a boundary likelihood is predicted to be used during the interactive delineation when generating final cadastral boundaries. (Figure on cover page)

Conclusion

The delineation cannot be fully automated at the current state since the extracted outlines require (legal) adjudication and incorporation of local knowledge from human operators to create final cadastral boundaries. Image-based approaches hold potential to automatically extract use rights, which do not necessarily represent legal rights. These circumstances limit the scope of automated approaches. The authors observed that automating cadastral mapping dealing with sensitive land rights can only be successful when the interactive part that bridges the gap between automatically generated results and the final cadastral boundary is designed and implemented in correspondence to user needs.

Acknowledgements

This research was funded within its4land, which is part of the Horizon 2020 programme of the European Union, project number 687828.

Student Forum

Map Skills for Elementary Students

Spatial Thinking in Grades preK-6 <https://www.nationalgeographic.org/education/map-skills-elementary-students/>



PHOTOGRAPH BY WINN BREWER, NATIONAL GEOGRAPHIC

Spatial Thinking and Maps Skills in Young Children

Spatial thinking allows students to comprehend and analyze phenomena related to the places and spaces around them—and at scales from what they can touch and see in a room or their neighborhood to a world map or globe. Spatial thinking is one of the most important skills that students can develop as they learn geography, Earth, and environmental sciences. It also deepens and gives a more complete understanding of history and is linked to success in math and science. Young students also enhance their language skills as they collaborate and communicate about spatial relationships. Students who develop robust spatial thinking skills will be at an advantage in our increasingly global and technological society.

This collection can help you teach an assortment of map skills through activities that address the spatial thinking abilities of young children and developmental appropriateness. The collection is not intended to be a complete map skill program, and the activities can be adapted for higher or lower grades. Click here for a downloadable summary of all activities and the learning objectives and spatial thinking concepts targeted in each activity.

Participatory mapping for socioenvironmental urban governance towards sustainable cities, study case in Guarulhos, Brazil

By Carolina Monteiro de Carvalho (School of Public Health, São Paulo University, Brazil)

The postdoctoral research project of Carolina Carvalho, School of Public Health, São Paulo University, supervised by Prof. Dr. Leandro Giatti, participatory mapping to map socioenvironmental important issues in the city of Guarulhos, São Paulo, Brazil. Guarulhos has 319 km² of area, a Human Development Index (HDI) of 0.763 in 2010, considered high according to official data (lowest is 0 and maximum is 1). It also has a population of 1,221,979 inhabitants, suffering with many socioenvironmental impacts due to uncontrolled urbanization process and inefficient governance, such as lack of basic resources (e.g. water), pollution and deforestation.

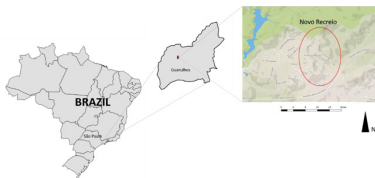


Fig1. Location map.

The main motivation of this research is to catch citizen's perception about these socioenvironmental issues that impact their daily lives. Uncontrolled urbanization and an inefficient and not

inclusive governance model are the basic problems. Therefore, the need for an innovative approach that allows social participation also motivated this project, and the use of participatory mapping, which was developed in two general stages:

The first stage: From April to June 2017, the course "Geographic Information Systems (GIS) for environmental health" was given to high school students, who attended the activities of the local NGO Clube de Mães, in Novo Recreio, a peripheral community inserted in a context of high socio-environmental vulnerability. The participants developed a participatory mapping of the community, marking variables such as access to energy, water, fresh food, street paving, inadequate waste disposal spots, and occurrence of landslides and floods. Along with this mapping, other participatory activities were carried out, such as sketch maps, community journals, and integrated panels (aiming co-creation of strategies and solutions to the discussed problems).

The map served to contextualize the area where they live, making participants observe that there is a large area of environmental preservation around them, that there is availability of water resources despite the situation of water shortage in the city, basic resources are really being mismanaged, etc. The following is the result of the mapping. With this mapping, sites with serious socioenvironmental issues were mapped, such as those with potential for

landslides/flooding and waste disposal, or areas with cumulative problems, that represents a risk to the health and safety of local dwellers. These are only two examples of what dwellers face daily. After the mapping, participants produced journals to communicate to the neighborhood their findings and propose solutions to overcome the problems. The discussion was a rich process, that promote

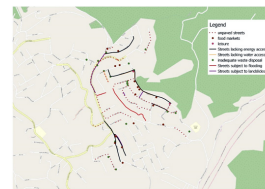


Fig 2. Participatory mapping for socioenvironmental diagnostic of Novo Recreio community, Guarulhos.

empowerment and awareness among them.

The second stage: After the participatory mapping in Novo Recreio, this research evaluated the citizens' perceptions of socioenvironmental problems in Guarulhos. This was done through a survey, elaborated with Maptionnaire, with questions that addressed aspects of the elements of urban nexus, water, energy and food, which are the basis for the citizen's quality of life and well-being. The survey was answered by 504 citizens and was possible to map problematic areas with lack of water, energy and food, as well as proposals for places for urban gardens and even new public transport routes (Figure 3). It was an excellent opportunity for social participation that the citizens had, to share their perceptions and feelings about the city. Responses are being analyzed at the moment, but it is already possible to make some important observations, such as areas where the lack of water and energy is greater and cumulative (Figures 4 and 5). Besides, a vulnerability analysis with citizen data are being carried out.

PI see cover page for the following figures:

Fig 3. Survey answers in Maptionnaire screen.

Fig 4. Areas with lack of energy.

Fig 5. Areas with lack of water.

The participatory socio-environmental mapping developed in the city of Guarulhos, São Paulo, was developed with the support of Prof. Dr. Marketta Kyttä (Aalto University, Finland), Prof. Dr. Nora Fagerholm (University of Turku, Finland) and Mapita Ltd, which provided us Maptionnaire license. This research is also inspiring more participatory mapping projects in São Paulo, Brazil, related to public health, ecosystem services and urban planning.

Soon complete results of this research will be released on the research blog: <https://sigparticipativo.wordpress.com/>

Five Decades of Mapping the Moon - 15/07/2019

Wim van Wegen

<https://www.gim-international.com/content/article/five-decades-of-mapping-the-moon>

This year, NASA is celebrating the 50th anniversary of the first crewed mission – Apollo 11 – landing on the moon. Besides that, this September it will be 60 years since the first unmanned mission – Luna 2 – reached the surface of the moon. Both of these milestones reflect the great contributions of the USA and the Soviet Union/Russia to space exploration, but they would not have been possible without spatial data. National Geographic has always been at the forefront of lunar mapping. At the time of the Apollo missions, crews relied on its hand-painted maps based on photos from 1966 and 1967 Lunar Orbiter missions. National Geographic has now released a new version of its moon map, consisting of a mosaic of 15,000 images and detailed height measurements from NASA’s Lunar Reconnaissance Orbiter.

Lidar technology

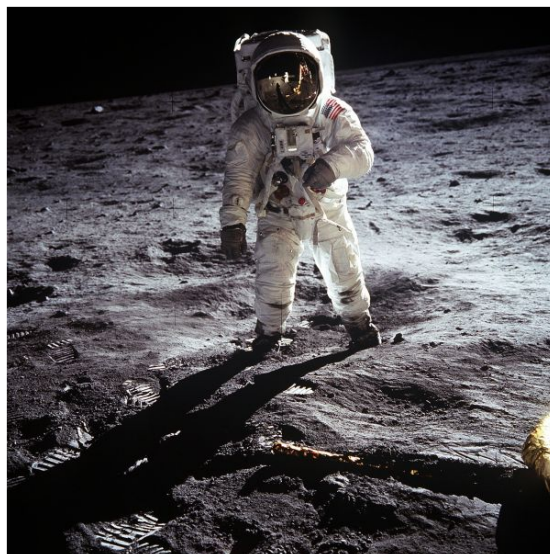
Much has changed since those first maps in the 1960s. Technologies such as GNSS and Lidar have emerged. Airborne laser mapping – a fully automatic method of directly measuring the height or elevation of the terrain from an aircraft or a satellite – is now utilized to make digital elevation maps (DEMs) of the moon. The Lunar Orbiter Laser Altimeter (LOLA) provides a precise global lunar topographic model and geodetic grid that serves as the foundation for essential lunar understanding. This aids future missions with topographical data for safe landings and enhanced exploration-driven mobility on the moon. LOLA also contributes to decision-making about where to explore by revealing insights into the evolution of the surface.

The Japanese SELENE spacecraft, used in the Kaguya mission which was launched in 2007, also carried onboard a laser altimeter. Kaguya was Japan’s second mission to explore the moon from orbit. The Lidar data derived from this mission enabled the first polar topographic maps with complete coverage to be produced, and it improved estimates of the lunar figure from a spherical harmonic model complete to degree and order 359 on a quarter-degree grid.

Buzz Aldrin walking on the surface of the Moon. Together with Neil Armstrong, Aldrin spent about two and a quarter hours outside the Apollo 11 spacecraft.

GNSS for moon missions

One might argue that the moon is not far beyond the reach of Earth satellite signals, and some interesting developments are indeed just around the corner. NASA simulations prove that GNSS signals could be used for reliable navigation in lunar orbit, far outside the Space Service Volume, over 200,000 miles from Earth. The space agency is even planning to use GNSS signals in the navigation architecture for the Gateway, an outpost in orbit around the moon that will enable sustained lunar-surface exploration.



Innovative cartography

Earlier this year, Ordnance Survey, Britain’s national mapping agency, employed its distinctive cartographic style to celebrate the 50th anniversary of the moon landing. Paul Naylor, cartographer and data visualization specialist, used NASA open data to create a stunning map of the lunar landing site. Commenting on his moon map, Naylor said: “The 1969 moon landing is one of humanity’s greatest scientific and engineering achievements, and the challenge of applying our innovative cartography and mapping tradecraft in honouring this achievement was too great to resist. I hope people can appreciate this as not just a map, but also as something beautiful to look at.”

Further Reading

1. NASA
2. National Geographic

EVENTS

GeoInformation for Disaster Management	September 3-6, 2019	Prague, Czech Republic	www.gi4dm2019.org
Future of Mining	Sep 4 -5, 2019	London	https://www.globalminingreview.com
GEOINT & Open Source Analytics Summit	September 10-11, 2019	NY, USA.	http://geoint.dsigroup.org/
AGSE 2019	Sep 11 - 14, 2019	Stuttgart, Germany	http://applied-geoinformatics.org/
Application of GIS, GPS & RS in Environmental Data Management	Sep 17 – 19 2019	Hyderabad	Escihyd.org
FOSS4G UK	Sep 18 – 21 2019	Edinburgh UK	https://uk.osgeo.org/foss4guk2019/
INTERGEO 2019	Sep 17 – 19, 2019	Stuttgart, Germany	www.intergeo.de
State of the Map	Sep 21 - 23 2019	Germany	https://2019.stateofthemap.org
International Symposium on Digital Earth	Sep 24-27, 2019	Italy	www.gis-professional.com/
MVP BIM 2019	Sep 24-25, 2019	, Czech Republic	http://mvpbim2019.org
International Geographical Conference of DGS	Sep 27-29, 2019	Jaipur, Rajasthan	www.thedeccangeographer.org
San Francisco Map Fair	Sep 27-29, 2019	SF, USA	sanfranciscomapfair.com/
GIS-Pro 2019,	September 28 – October 2, 2019	LA, USA	www.urisa.org/gis-pro
LADM 2019 - Geomatics Geospatial Technology	Oct 1-3 2019	Malaysia	isoladm.org/LADM2019Workshop;
2019 AGIC	October 1 - 4, 2019	AZ USA	http://www.agicsymposium.org
GITA's Pipeline Technology Forum	October 2 – 3, 2019	TX, USA	https://web.cvent.com/event
GEOVET 2019	October 8 - 10, 2019	CA, USA	https://web.cvent.com/event
National Seminar Regional Studies	Oct 9-10, 2019	Hyderabad	www : uohyd.ac.in
AGIC Education & Training Symposium	October 1 - 4, 2019	USA	www.agicsymposium.org/
Digital Technologies in Surveying & Mapping	Oct 15-16 2019	Hyderabad, India	telanganasc@ieindia.org
International Conference of IGU	Oct, 19-21, 2019	Haryana, India	www.cuh.ac.in
Future of Mining Americas 2019	October 21-22 2019	CO USA	https://americas.future-of-mining.com
IAC 2019	Oct 21 - 25 2019	Washington D.C, USA	media@iafastro.org
IMAGERY TO DIGITAL REALITY: ERS & Photogrammetry	Oct 28-31 2019	Seoel, Korea	http://conf.racurs.ru/conf2019/eng/
Annual World Congress of Ocean.	Nov 2-4 2019	China	www.bitcongress.com/WCo2019
Africa GIS 2019.	Novr 18 – 22, 2019	Kigali, Rwanda	www.eis.africa/
National Symposium on Innovation in Geospatial Technology	Nov 20-22, 2019	Shillong, India	www.isgns2019.in
National Conference on 'Building A Disaster Resilient Society'	Nov21-23, 2019	Raipur, India	www.prsu.ac.in
Amsterdam Drone Week,	Dec 2-6, 2019	Amsterdam	www.amsterdamdroneweek.com
Geosmart India 2019	Dec. 3-5, 2019	Hyderabad	www.geosmartindia.net
Conference on Cities	11-13 Dec. 2019	Roorkee	www.icfc2019.com
3rd Asian Regional Conference on Peri-Urbanisation, SPA,	17-20 Dec. 2019	Bhopal	www.3rdperiurbanconference@spabhopal.ac.in
Indian Geographical Congress of NAGI	Dec , 28-30, 2019	Sagar, M.P. India	nagi.org.in
InfraTech 2020	14-16 Jan 2020	Germany	https://www.infratech.de
Mountain Cartography Workshop	April 14 - 18, 2020	CO USA	www.shadedrelief.com
FIG Working Week 2020 - "Smart surveyors for land and water management	10-14 May 2020	Amsterdam	http://www.fig.net/fig2020/
FME International User Conference	16-19 June 2020	Vancouver, Canada	https://fmeuc.com/
Mountain Cartography Workshop	April 14 - 18, 2020	CO USA	www.shadedrelief.com

Information about events has been compiled from different sources. Readers are advised to check correctness from the organisers

Rachapudi Kamakshi Memorial Gold Medal for 'Young Geospatial Scientist™ 2019'

For the past 10 years Rachapudi Kamakshi Memorial Trust has been encouraging Young Geospatial Scientists with Rachapudi Kamakshi Memorial Gold Medal. The award consists of a Gold Medal, Certificate of Merit and a Citation Plaque. This year, the award will be presented to the selected young researcher during the Geosmart India 2019, 3-5 December 2019 at Hyderabad.

Criteria for Selection

Basic criteria for the award will be the research work carried out in the field of geospatial science and technologies with innovativeness and appropriate use of scientific methodology, backed with quality write-up, social relevance and commercial acceptability of the idea and the adequate usage of geospatial technology.

Selection Process

An eminent panel of jury will evaluate the nominations and interact with the nominees, if required, before selecting the awardee.

CELEBRATING

10
years

of recognising
Geospatial Talent



2010

Ms Thiyaam Tamphasana Devi, Indian Institute of Technology Guwahati, receiving the 2010 award from Shri Narendra Modi, Chief Minister of Gujarat



Nominations are invited from scientists, engaged in research work in any of the areas related to Geospatial Information Science and Technology, who is not more than 35 years of age, as reckoned on 31 October 2019.

Nominations for the award should clearly state the scientific contribution supported by relevant documents. Self nominations are permitted.

The nominations are required to be submitted to **Dr Hrishikesh P Samant, Vice-Principal (Science) & Associate Professor in Geology, St. Xavier's College, (Autonomous) Mumbai - 400 001** and also by email at hrrhikesh.samant@xaviers.edu and rkmt2011@gmail.com

Past Awardees

2011



Dr. M B Rajani receiving the 2011 award from **Shri M Shashidhar Reddy**, Hon'ble Vice Chairman, National Disaster Management Authority

2012



Ms. Farjana Sikander Birajdar, receiving the 2012 award from **Dr. Shailesh Nayak**, Secretary, Department of Earth Sciences, Government of India.

2013



Mr. Rishikesh Bharti, Indian Institute of Technology Bombay, receiving the 2013 award from **Mr. Suresh Prabhhu**, former Union Minister

2014



Ms. Nandini Ray Chaudhury of SAC (ISRO), receiving the 2014 award from **Dr. Shailesh Nayak**, Secretary, Department of Earth Sciences, Government of India.

2015



Ms. R. Shilpa, Scientist, KSRAC, Bengaluru, receiving the 2015 award from **Gen. V.K. Singh**

2016



Dr. A. J. Luis receiving on behalf of **Dr. Shridhar Digambar** Jawak NCAOR from **Ms. Vanessa Lawrence** former DG Ordnance Survey, UK

2017



Dr. Shrutipti Bhattacharjee of Technical University Munich, Germany receiving award from **Dr. YS Chowdhary**, MOS Science & Technology

2018



Dr. Sali Goel of IIT Kanpur receiving the award from **Gen. V.K. Singh (Retd)** MOS External Affairs

The last date for receipt of the nominations is October 31, 2019

For more information please visit: www.rachapudikamakshi.org

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- Aerial LiDAR & Imagery, Mobile LiDAR data Acquisition and Processing
- Geotech Engineering and Geophysical Surveys
- Underground Utility Detection (GPR)
- Underwater Leak Detection and Turnkey Solution
- Airborne and Ground Geophysical Surveys
- Route Planning & 3D Corridor Mapping
- GIS/CADD Data Processing
- Geodetic, Topographic, Cadastral, Hydrological Surveys

HONOURS & AWARDS

Geospatial World Excellence Award 2018

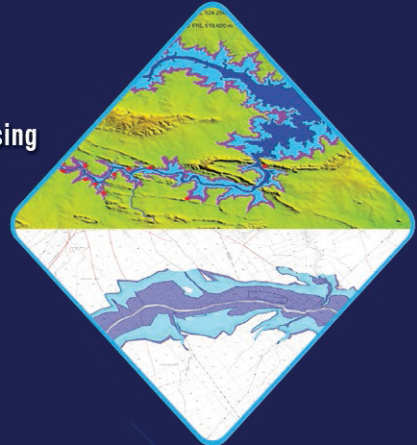
Best Professionally Managed Company 2014

Geospatial Company of the year 2013

National award for Excellence in Engineering Consultancy 2012

Project of National Excellence - Urban Infrastructure 2011

Export Excellence Award 2008 & 2010



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