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MAPS TODAY

Monthly Publication February 2019

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MAPS TODAY

Monthly Publication

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Editorial

National Survey Day is celebrated every year throughout India to commemorate the measurement of the first Baseline of Great Trigonometric Survey (GTS) on 10th April 1802 near Chennai, Tamilnadu. GeoMap Society (GEMS) has been part of these programmes every year. This year also GEMS will be observing National Survey Day.

Today Surveying has emerged in different forms i.e . Field /Control Surveys, Photogrammetric Surveys; LiDAR Surveys; Cadastral Surveys; Engineering Surveys- Irrigation, Mining, Town Planning,Roads & Buildings, Hydrographic, etc. However, Photogrammetric surveys remained in the key position as they operate from ground (terrestrial). Drone, Air and Space. In this issue we cover material indicating entry of photogrammetry into mobile phones i.e. smartphone photogrammetry.

An interesting review article on GIS (GIScience) and social media is included. This article with a visionary approach raises challenges in this field. Users of GPS will fInd the article on accuracy quite useful and thought provoking,.

News item of GIS market of North America gives an idea of GIS tends. In India too, Telecom, urban and rural applications seem to have good scope for GIS. GIS for Asset management .is another growing market area for India. Read about this in a brief article.

New maps and new ways of reading maps give us a new geography of human suffering and extinction. Read about this in this issue.

GIS Applications

Asset Management

https://grindgis.com/

Some of the applications of GIS in asset management.

Market Share - Examining branch locations, competitor locations and demographic characteristics to identify areas worthy of expansion or determine market share in Maptitude. Investors can analyze the available market share and figure out the potential of a given market using GIS.

ATM Machine – Filling in market and service gaps by understanding where customers, facilities, and competitors are with address locating, database management and query tools. Through the use of GIS, banks are able to make good use of their assets and resources through mapping out the various locations where an ATM should be put up.

Supply and Demand – Identifying under-served areas and analyzing your competitor's market. It is also a bit easier, thanks to GIS, to analyze the market dynamics of demand and supply and identify areas where demand is diminishing and where supply may be increasing.

Community Reinvestment Act (CRA) – Fulfilling the obligations to loan in areas with particular attention to low- and moderate-income households – using GIS to understand spatial demographics.

Mobile Banking – Capturing locations where existing mobile transaction occur and assisting in mobile security infrastructure. GIS can also help in identifying the areas where mobile transactions occur and mapping out accordingly in order to plan for these.

Commercial Establishments – Updating commercial establishment using gvSIG Mobile and a local databases. It is also easier than ever to update various commercial establishments using GIS.

Supply Chain – Finding which supply chains are vulnerable to better plan for interruptions. GIS is also an asset to supply chains because it helps in identifying the areas where the chains are suppressed and then important decisions can be made regarding the survival of these chains.

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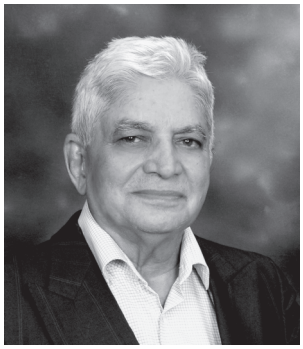
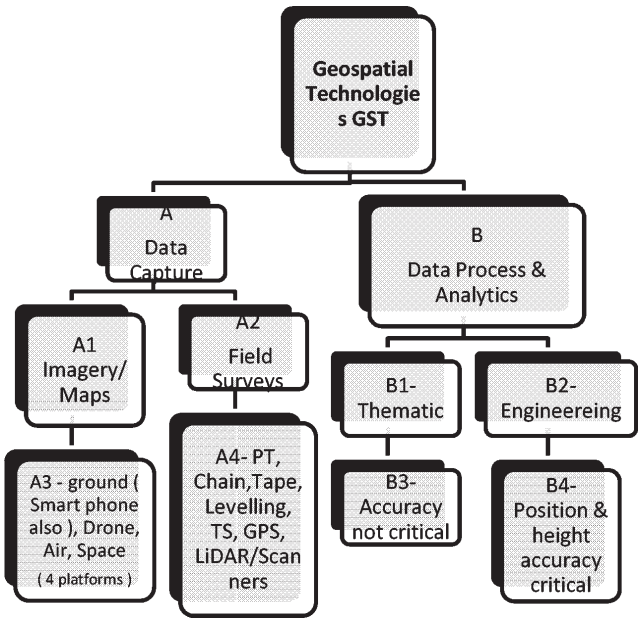
---- *Editor* ***G.S. Kumar***

GeoSpatial Technologies – Perspective



GS Kumar,
Retd Director, Survey of India;
Editor, Maps Today

About 40 years back when digital technologies started entering into the field of Surveying & Mapping, existing professionals started feeling out-of-place. GST seems to have turned a full circle. Data capture (Surveying) regained its importance. See the chart below.



GST has two main components – Data capture and Data processing. Data with appropriate software has solutions for every application. Efficiency speed and economy are the features. Some examples given below:

1. Village/Region Development – Planning, implementation and monitoring

A3 – Space Imagery - Bhuvan ISRO website free Imagery with analytical functions

A4 – Plane Table field survey to add/ delete details

B1- Using Open source QGIS, Spatial / GIS data base can be developed for planning, implementation and monitoring. Expenditure is on the technical person mostly on computer and a little it on ground. One time Cost is about Rs 20,000 and recurring cost Rs 2000 p.m.

2. Cadastral Surveys

A3 Stereo-Imagery from Air or Drone or Smart phone, ortho rectified usng DGPS/TS ground control.

Field visit to identify property boundaries and other features

Finally to create Land Informaion System with 5 cm accuracy in plan and height

Rs Rs 200 per acre (Land cost in lakhs of rupees) or Rs 500 per hectare or Rs 50,000 per sq km.

3. Business GIS Applications

A3 Imagery /Maps suitable for identifying buildings/ features. Field visits to classify(Interpret). Develop GIS data base help take decisions.

Cost = Rs 7000 per sq km approx.

The above few examples are to broadly demonstrate that GST today has solutions for many situations at affordable cost and less time. Digital data base can be maintained up-to-date and outputs hard or soft copies generated as required.

Rules made during British time need to be changed for deriving advantage of new technologies.. For example, DGPS observations are captured in the receivers. The rule says the concerned official in the government has to certify the correctness. This was Ok during manual measurement days. But not now.

The objective of this article is to highlight that GST has reached a stage of developing applications which are affordable, cost effective and efficient.for good governance.

Mohan's Musings

How good are your observations?

As one measures the coordinates of a point or the length of a line, the imminent query that crops up is how good is the measurement. What is the error? Is it precise? What is the accuracy? Can you remeasure and get the same results? etc.

Let's revisit some of these familiar but important terms and try to interlink them where possible.

To start with, error refers to the difference between the measured value and the correct(true) value.

Accuracy

Accuracy refers to how close a measurement is to the true or accepted value.

Lets say we are measuring a length of a study table whose actual length is 100 cm. Accuracy is how close the measurement is to the actual length.98 cm and 102 cm (±2 cm) are more accurate than 90 cm and 110 cm (±10 cm) respectively.

Quite often in mapping, we hear the term *relative accuracy*. It is the degree to which a given point on a map is accurate *relative* to other points within that same map.

Consider the longitudinal coordinate of all map features are erroneous by 200 metres. The relative accuracy (i.e. the distances among the features) is not affected.

Precsion

Precision refers to how close measurements of the same item are to each other. **Precision** is *independent* of accuracy. That means it is possible to be very precise but not very accurate, and it is also possible to be accurate without being precise.

Let us think the measuring tape (1–metre long) itself is short by 2cm due to shrinking. Hence, always you end up with a value of 102 cm against a true value of 100cm. The precision in this case is 2cm.

Precision includes:

- *repeatability* — the variation arising when all efforts are made to maintain conditions constant by using the *same* instrument and operator, and repeating during a *short* time period;
- *reproducibility* — the variation arising using the same measurement process among *different* instruments and operators, and over *longer* time periods.

Let us note that the best quality measurements are both accurate and precise.

A classic way of demonstrating the difference between accuracy and precision is with a dartboard. Consider the bulls-eye (i.e the centre of the circles) of the dartboard as the true value. The closer the darts land to the bulls-eye, the more accurate they are. There are four possibilities:

			
The darts are neither close to the bulls-eye, nor close to each other.	All the darts land very close together, but away from the bulls-eye.	The darts are all about an equal distance from bulls-eye and spaced equally around it. Statistically speaking, this is *encouraging* as the average of the darts' postions is at the bulls-eye.	The darts land close to the bulls-eye and close together.
Inaccurate and imprecise	Precise but inaccurate	Accurate; but imprecise	Accurate and precise

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GIS Market

https://www.technavio.com/report/gis-market-in-north-america-industry-analysis

The increasing use of GIS solutions in big data analytics is one of the major trends being witnessed in the **GIS Market in North America 2019-2023**. The merger of GIS data with big data analytics has led to a new way of analyzing massive volumes of cluttered data to gather meaningful and useful information. Some functions of this customized GIS software are visualization and analysis of maps, online publication of map applications, and recording of huge volumes of spatial data in Hadoop. Thus, with the many advantages such as these, the market is expected to witness a positive outlook during the forecast period.

(This report is available at a USD 1,000 discount for a limited time only: View market snapshot before purchasing)

According to Technavio analysts, one of the key factors contributing to the growth of the GIS Market in North America is the importance of GIS in capacity and urban planning activities:

GIS provides its users with information about market segmentation and consumer usage patterns.

The telecommunications sector is one of the prominent end-users of GIS. The sector has become saturated in urban areas and the competition is intense. Hence, most of the vendors prefer to focus on rural areas, where demand for telecommunication voice and data services is on the rise, and there is a relatively low level of competition. Capitalizing on the rural market requires telecommunication companies to undertake precise planning. GIS provides its users with information about market segmentation and consumer usage patterns. It is extensively used to devise a communication network structure after taking into consideration the future communication demands of the region. GIS also facilitates effective decision-making by using the existing network structure and network performance. GIS equips urban planners and engineers with tools such as spatial analysis, spatial modeling, and visualization which will aid in designing and mapping cities and towns. Therefore, the market is expected to register a rise in growth during the forecast period.

According to a senior analyst at Technavio for research on enterprise application, *"Another factor boosting the growth of the market is the adoption of GIS by enterprises to improve communication and customer services. Currently, organizations are increasingly implementing enterprise GIS, which allows them to access all geospatial data and applications across the entire organization. As most of the data present within an organization, such as client location, sales data by geography, and others can be linked to geo-location tags, any patterns that could not be identified earlier using spreadsheets or databases, can now be displayed, queried, and analyzed online. Hence, GIS solutions are helping organizations in sharing resources, data, and applications, as well as aiding in increasing operational efficiency and improving decision making."*

GIS Market in North America: Segmentation analysis

The GIS Market in North America research report provides market segmentation by end-user (government, military, utilities, telecommunication, others), and by region (US and Canada). It provides an in-depth analysis of the prominent factors influencing the market, including drivers, opportunities, trends, and industry-specific challenges.

The government segment held the largest share of the market in 2018, accounting for over 20% share, followed by the military, utilities, and telecommunication respectively. During the forecast period, the utilities segment is expected to register the highest incremental growth, followed by the military segment.

Looking for more information on this market? Request a free sample report

Technavio's sample reports are free of charge and contain multiple sections of the report such as the market size and forecast, drivers, challenges, trends, and more.

Some of the key topics covered in the report include:

Market Landscape

- Market ecosystem
- Market characteristics

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Abstract/extracts - REVIEW ARTICLE

The convergence of GIS and social media: Challenges for GIScience

Daniel Sui & Michael Goodchild

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It is hard to believe that 10 years have passed since we wrote our guest editorial for IJGIS (Sui and Goodchild 2001). Using the nascent evidence that emerged in the late 1990s, we speculated back in 2001 that geographic information systems (GIS) were rapidly becoming part of the mass media. On the basis of the proposition of GIS as media, we were able to link GIScience with theories in media studies such as Marshall McLuhan's law of the media, which considers modern media as modiûable perceptive extensions of human thought (Sui and Goodchild 2003). Remarkable conceptual and technological advances in GIS have been made during the past 10 years. The goal of this review is to provide an update on the 'GIS as media' argument we made 10 years ago and to discuss the new challenges for GIScience posed by the growing convergence of GIS and social media.

Currently, we have thousands of websites offering a variety of mapping or geospatial services.

1. Online mapping sites are increasingly social

Currently, we have thousands of websites offering a variety of mapping or geospatial services. Indeed, the launching of online mapping tools such as Google Earth, Microsoft's Virtual Earth/Bing Maps, and NASA's World Wind validated our speculation.

That GIS have also increasingly been recognized as media by software-tool developers and vendors is indicated by the names they choose for their products: GeoMedia, SpatialMedia, Map TV, or MapTube.

This new role of GIS as social media can be understood from two perspectives. First, various users and contributors of online mapping sites have formed their own virtual community for exchanging information. Google Maps, Bing Maps, and Yahoo!

…….. recent postings by participants of the online mapping community have been covering topics of greater public interest, such as mapping of the location of bin Laden's death, Google Earth mashups of critical sites using data posted on WikiLeaks, tracking the diffusion of BP's oil spill in the Gulf of Mexico, and assisting in the relief efforts for earthquakes in Haiti and Japan.

Second, interactions of online GIS users or neogeographers (Turner 2006) or neocartographers (Liu and Palen 2010) are not conûned to cyberspace. A growing number of these actions have resulted in meetings in person and activities in real places. For example, participants of OpenStreetMap (OSM) in both North America and Europe have been organizing mapping parties over weekends to work together to map the road networks for their communities (Figure 1). OSM even gives speciûc instructions on how to organize these mapping parties (http://wiki.openstreetmap.org/wiki/Mapping_Weekend_Howto). URISA'sGISCorps program has been able to organize evolunteers with GIS skills and send them all over the world to fulûll various mapping needs (http://giscorps.org).

Many other websites developed in the tradition of citizen science have also attracted large numbers of volunteers, who then meet in person to collect data for various projects that beneût the community (e.g., MapAction, Walk Across Texas, Bike to Work Challenge, CitySourced). Just as social media can be deûned as social interaction via the use of Web-based and mobile technologies, to turn scalable communication into interactive dialog, so too have these new trends discussed here shifted the role of GIS from being an arcane technology used by trained professionals, to a popular social medium for the general public to report problems and to build community.

In summary, GIS as media constitute a fundamental paradigm shift in GIS, from the old model of an intelligent assistant serving the needs of a single user seated at a desk, to a new mode in which GIS act as media for communicating and sharing knowledge about the planet's surface with and among them assess. During that process, GIS not only bring people together in cyberspace but also attract people to meet in person for the common good of theircommunity.The paradigm change also implies a simultaneous shift of technical focus, from local performance to network bandwidth, and increases interest in issues of semantic

2.Online social networking sites are increasingly location-based.

…… media are increasingly becoming like GIS. Again, this new trend of media as GIS can be understood from two perspectives. First, the mainstream media (TV, newspapers, etc.) are increasingly relying on GIS and geospatial technologies to report news and to tell their stories to the general public. Nowadays, Google Earth or Bing Maps are almost an integral part of the TV broadcasting of everything from weather and trafûc conditions to major stories.

The development of location-based social media during the past 2 years has moved social media from cyberspace to real place.

……the Chicago Tribune and Time magazine use ESRI's MapStudio (recently renamed as MapShop), whereas the Seattle Times and Guardian use Google Maps. Using the geospatial mapping server hosted by the Guardian, for example, the public can create custom maps from data disclosed by WikiLeaks. Furthermore, news organizations have posted the original data online so that anybody can download them, conduct their own analysis, and draw their own conclusions

Media as GIS can also be understood from a second growing perspective that social media are increasingly location-based. Social media, led by MySpace, Facebook, Twitter, LinkedIn, and so on, have been described as one of the deûning characteristics of Web 2.0 technologies. The phenomenon of social media is not only transforming the scene of computing but also stimulating social change of various kinds. The development of location-based social media during the past 2 years has moved social media from cyberspace to real place. Similar to the functions of Google Latitude ,most location-based social media allow users to know and see on a map where their friends are physically located at a particular time.

…….the development of more robust data analysis and synthesis methods for studying spatial dynamics is a grand challenge for GIScience.

Where has always been one of the fundamental questions guiding journalists, along with who, what, when, why, and how. So we are not surprised to see what may amount to a spatial turn in journalism and the traditional media. Indeed we fully concur with the renowned journalist Krissy Clark (2011) when she observed that 'The best journalism is like a map. It shows where you are in relation to others; it provides a sense of topography, a glimpse into a new world, or a better understanding of a familiar one. Ideally, journalism helps citizens and communities discover where they are, so they can better decide where they are going.'

3.Key challenges for GIScience

3.1. The data avalanche: Deep data for many?

This vision of synthesis is strongly associated with Digital Earth (Gore 1992), the creation of a single, uniûed perspective on distributed geographic information, together with the ability to visualize that information in a virtual reality. It raises substantial fundamental challenges for GIScience, in addressing uncertainty, matching data to application, tracking provenance, achieving semantic interoperability, and dealing with massive data volumes (Goodchild 2011a).

3.2. Spatial dynamics: Synthesis and visualization

Our growing capabilities of time-critical mapping and people-based GIS present us with an unprecedented opportunity to have a better understanding of the spatial dynamics of human behavior and societal transformation, but attaining this goal demands better tools to study spatial dynamics. We can concur with Yuan (2011) that the development of more robust data analysis and synthesis methods for studying spatial dynamics is a grand challenge for GIScience. Thisneedismoreurgent inthecontext oftheconvergence ofGISand social media. As of today, we still do not have the tools to automatically discover relevant information for a particular application over the Web, when a range of tools and websites are used by different groups of people

How can cartography and geovisual analytics contribute to representations of spatially embedded social networks?

3.3. New theories in GIScience: network, place, and multimedia narratives

Our knowledge 'swims in the continuum of uncertainty and of indeterminacy' [Pierce cited by Couclelis (2003)]. The current tide toward a data-driven science should not blind us to a basic fact that our understanding of the world is not entirely determined by the quantity and quality of data alone. Certain aspects of the world are inherently unknown or unknowable due to the limitations of our logical apparatus and cognitive capabilities (Couclelis 2003). Even for data collection through the mechanism of crowd-sourcing, such as the OpenStreetMap effort, Haklay et al. (2010) have demonstrated that Linus' Law is applicable only to a certain threshold, beyond which adding more volunteers (the eyes of Linus' Law; Raymond 1999) seems to lead to little further improvement in data quality.

3.3.1. The development of new network-based ontologies

Until recently, our data models and representation frameworks have focused exclusively on unary spatial knowledge – knowledge about properties z present at locations x in space-time, often expressed as maps. The convergence of GIS and social media has resulted in more data about the properties z of pairs of places in space-time x1,x2 (binary spatial knowledge), such as who is following whom on Twitter, social afûnity and interaction as demonstrated through Facebook links, or Internet information ûows among major cities. These binary properties involving pairs of locations are not ideally suited to mapping using conventional mapping and cartographic techniques. Networkbased representation models have been developed for environmental and disease modeling (Bian and Liebner 2007, Mao and Bian 2010), but representation of complex multilevel social networks remains a major challenge. Is there a way of using spatial information to generalize large complex social networks effectively, or to represent sparse and inconsistent information in a way that makes the resulting analysis actionable? How can cartography and geovisual analytics contribute to representations of spatially embedded social networks? How can we use changes of edges in network graphs to represent changes of networks in physical space? What are other possible representations for network data: polygons, trajectory polylines, or other spatial forms? (see the ûnal report of a 2010 specialist meeting on Spatio-Temporal Constraints on Social Networks at : http://www.ncgia.ucsb.edu/projects/spatio-temporal/docs/workshop_report_ûnal.pdf

3.3.2. Formalizing place in GIS

The convergence of GIS and social media prompts a new level of urgency for theoretical works to reconcile the world of space (traditional GIS) and the world of place (social media).

Agnew(2005,p.84) observed that'...space can be considered as"top-down,"deûned by powerful actors imposing their control and stories on others. Place can be considered as "bottom-up," representing the outlooks and actions of more typical folks.'

Formalizing place in the GIS context will be both interesting and challenging; until recently, place has been off the intellectual radar screen of GIScientists, many of whom appear to use the two terms place and space somewhat interchangeably. Preliminary work has begun in the digital gazetteer literature (Goodchild 2011b). In a broader sense, the emerging critical GIS literature of the past 15 years has caused a subtle shift of focus from space to place, with its rich cultural dimensions; yet in GIScience, we still do not have an overarching theory of place or how to work with the concept.

3.3.3. Multimedia representation

This emerging world of place is increasingly represented by a combination of texts and blogs, photos, sounds, videos, and other means of human representation, real or imagined. Journalists have relied on this plethora of media representations to conduct location-based storytelling. Every place has a thousand stories, journalists tell them every day, and news organizations have archives full of them. With more and more location-aware technologies available, what methods and models can we follow to link GIS with this multimedia metaverse, to tell stories about the surface of the Earth better, and to develop a more coherent narrative for the future? The answers to all our questions may emanate from the landscape itself (http://murmurtoronto.ca). Are there more efûcient, effective, and creative ways to link these stories to the places where they are rooted?

Big corporations will increasingly have custody of big data, and their bottom line tends to be driven by proûts rather the common public good

3.4. Social and political concerns: Equity, privacy, and sustainability

In big-data society, Manovich (2011) warned that people and organizations can be divided into three categories: those who create data (both consciously and by leaving digital footprints), those who have the means to collect (them), and those who have expertise to analyze (them). Today the ûrst group includes almost everyone in the world who is using the Web or mobile phones. The second group is smaller, but it is increasingly controlled by a few major corporations such as Google, Microsoft, Amazon, and Yahoo! that can afford the massive cloud computing infrastructure to host their various free services, through which they not only collect but also retain and process a massive amount of data. The third group is smaller still. This trend raises some interesting social and political issues. Big corporations will increasingly have custody of big data, and their bottom line tends to be driven by proûts rather the common public good. What are the implications? Will the growing popularity of social media, and social media integrated with GIS, enlarge or narrow the digital divide between the haves and have-nots (Sui2011)? Currently,we do not have guidelines on when it is appropriate to collect information from people and to study people without theirknowledge and consent. When is informed consent necessary for initiating research? Is there a way to preserve spatio-temporal patterns of social networks for research, but to protect privacy at the same time? Furthermore, what types of

Is there a way to preserve spatio-temporal patterns of social networks for research, but to protect privacy at the same time?

generalization and aggregation from statistics and cartography can be adapted to achieve these dual objectives and minimize the impacts of the stubborn modiûable areal unit problem (MAUP) in our analysis? How does the level of abstraction and aggregation limit the types of network questions that can be answered? In data-sharing projects, what practices and restrictions are necessary to prevent malicious uses of spatial data and spatially embedded network data? Another issue concerns the various degrees of information accessibility between different groups of people. How can we reach people without access to mobile phones, computers, and the Internet? Considering the fact that not all Internet users are necessarily social media users, how can we disseminate relevant information to people who have not adopted online social-networking services? In addition, online social networks are only a small fraction of the total set of real social networks; how can we collect data on social networks that are not represented in the digital world? What spatial sampling strategies will allow us to measure spatial,temporal,and social properties in hard-to-reach populations? Civil society has been integrated into the military infrastructure of digital media (Internet, GPS, etc.): will it subtly accelerate the process of militarization in society? What are the environmental implications as a result of the convergence of GIS and social media? Will the trend stimulate more travel as a result of initial online contacts (thus potentially damaging the environment), or will it help the environmental cause by facilitating better planning and coordination of various human activities? Are the technologies of online social media and cloud computing 'green', in the sense that they create less environmental impact than the technologies they replaced? Or is it better to think of them as new technologies that add to humanity's net environmental impact?

3.5. GIS education and public engagement

The fusion of GIS with social media will embed GIS and location-based services into people's daily routines. This trend not only provides the GIScience community with an unprecedented historic opportunity for public engagement but also raises some fundamental questions about the meaning and role of GIS education. For the long-term sustainable growth of GIScience, it is imperative that we start a serious dialog on what,why,and how we should educate and train our students (and the public) about GIS and related ûelds. Many have argued that the development of spatial intelligence must be given more prominence in education at all levels, if the next generation of users of geospatial technologies, including geospatially enabled social media, is to make effective and responsible use of them (National Research Council 2006). With GIS and mapping technologies increasingly being used to illustrate issues ranging from earthquake relief and environmental disasters to human rights abuses and the on-going war on terrorism, what additional knowledge and skills are needed? Is GIS education ultimately about geographic education? If so, perhaps GIScientists can learn something useful from geographers' efforts to engage the public and even possibly to change the world in meaningful ways (Murphy 2006, Castree et al. 2010). The GIScience community has a proud record of engaging the public through research on public-participation GIS (we bring GIS to the public) and most recently through VGI and social media (the public and neogeographers bring their data to us). What new collective strategy should we develop in our outreach efforts and public engagement?

4. Summary and conclusions: plural views of the world and multiple futures of GIS

In this editorial, we have identiûed a few topics that we believe are important, but we believe the future of GIS is inherently unpredictable. If there is one thing we are certain of, it will be that the future development of GIS will be on multiple tracks, as indicated by GIScientists' growing interest in such topics as the GeoWeb, Digital Earth, CyberGIS, virtual geographic environments, and cloud computing. Perhaps one productive way for GIScience to proceed is to ride on the discipline of geography's communication turn and the spatial turn that is evident in media studies.

– the communicational turn (Adams 2009) – is evidenced by the formation of the communication geography specialty group of the Association of American Geographers and the publication of new geography journals and textbooks devoted exclusively to media and communication geography. Although interest in media and communication has been identiûed as a relatively new phenomenon, geographers of various philosophical persuasions have long recognized the role of media and communication (and more broadly of language, maps, and GIS) in shaping space and place at various levels. As social media become more locationally aware and people's experiences with their environment are more mediated, it is not surprising that media studies have witnessed a 'spatial turn' during the past 5 years (Morley 2007, Döring and Thielmann 2009), focusing on the complex interaction among people, space, and place as mediated by various media (Jansson 2007, 2009). Ground-breaking work has been reported by scholars in multiple disciplines under the general rubric of the spatial turn in media studies, ranging from the highly technical work of harvesting social-network data to the search for emerging geographical patterns of new social interactions enabled and revealed by social media.

GPS Accuracy and Reliability

It's Time to Shift to GPS Accuracy and Reliability – Just Like the Scots - 31/10/2018

John Florio

https://www.gim-international.com/content/article/it-s-time-to-shift-to-gps-accuracy-and-reliability-just-like-the-scots

A short provision in the larger Islands Act bill passed by the Scottish Parliament in July 2018 now requires government mapmakers to put the Shetland Islands where it belongs.

Tavish Scott, a politician representing the Shetland Islands, had fought for the provision because he wanted more honesty in maps of Scotland.

In this column, John Florio writes that in the same way Scott wanted context for his home, the GNSS receivers used today need more context too. Manufacturers should be clearer about the accuracy and reliability of the data their devices deliver, he claims.

Tavish Scott wanted more honesty in maps of Scotland – and in July, he got it. A short provision in the larger Islands Act bill passed by the Scottish Parliament now requires government mapmakers to put the Shetland Islands where it belongs. Scott, a politician representing the Shetland Islands, had fought for the provision.

Manufacturers should be clearer about the accuracy and reliability of the data their devices deliver, he claims.

Cartographers often pulled the vast and solitary archipelago toward the mainland by putting its islands in a box, erasing the vast swath of sea between the two. Scott said the sea is a feature of Scotland, not a bug. "It seems to me a bit strange not to have the sea as part of the geography of Scotland. It's the reality of where we are," he told CBC. "The logistics of getting to and from Shetland are all too often overlooked, and this has a serious impact on the economies of the islands," Scott said when he announced the legislation. Scott wanted context for his home – and, in this case, the sea provided context. Scottish maps were accurate, but they did not reliably contextualise the Shetland Islands with the mainland.

John Florio

In the same way, the GNSS receivers used today need more context. Manufacturers have used sub-metre, sub-foot, and even sub-centimetre to describe the levels of accuracy offered by their GNSS receivers. While some manufacturers' claims are dubious – one claim even caused a small uproar in the GNSS community – most claims to accuracy are legitimate. But, like Scottish maps, are they reliable, repeatedly placing measurements next to one another?

It is fair to say that high-level accuracy in most GNSS receivers has arrived. However, the reliability of receiver accuracy is the next frontier. Three receivers by three different manufacturers could claim sub-metre accuracy, even though each manufacturer uses a different statistical method to make the claim. One might use circular error probable (CEP), a calculation that qualifies the data as sub-metre only 50% of the time. Another could use root mean square (RMS), denoting the data is only truly sub-metre on around 65% of a job. The third manufacturer could use twice the distance root mean square (2DRMS), a measure that indicates the data as sub-metre-accurate around 95-98% of the time. Those three 'sub-metre' devices are not exactly equivalent, though it seemed they were. In the same way, three different Scottish maps could have boxed, moved and manipulated the Shetland Islands.

Soon, GNSS professionals will turn on a receiver and simultaneously capture 30-50 satellites, deriving measurements from four distinct constellations that all overlap.

A receiver that only delivers on its promise for half of an eight-hour job would likely disappoint its user. That is four hours of wasted resources – and potentially four more hours of work. For that reason, manufacturers should be clearer about the reliability of the data their devices deliver. In the meantime, consumers will have to step up to the plate and do these five important things before purchasing a GNSS receiver:

1) consumers should accurately define the job they are doing. This gives the sales representative a better picture of the solution the application requires, 2) the consumer should avoid buying products with features inapplicable to their job. Otherwise, they will likely end up with a more expensive product they do not need, or a seemingly inexpensive product that does not deliver the desired results, 3) consumers should ask how the manufacturer validates product claims like accuracy, 4) consumers should ask how reliably the product delivers its advertised accuracy, and 5) consumers should ask for customer references, a live demonstration, a test device or a rental to validate that the product meets their needs.

Luckily, like accuracy, improved reliability is on its way. Not too long ago, an affordable sub-metre receiver was a pie-in-the-sky dream. However, today that sky is populating with satellites. Surveyors who once meticulously plotted the exact time and location of their GPS activities to catch good data – a practice called mission planning – might jokingly resent the accessibility of today's satellites. (The 'war stories' of 2 a.m. mountaintop observations are legendary.)

There are 27 GPS satellites, 24 GLONASS satellites and two more satellite constellations on their way with Galileo and BeiDou. Soon, GNSS professionals will turn on a receiver and simultaneously capture 30-50 satellites, deriving measurements from four distinct constellations that all overlap. It is time for manufacturers to stop drawing their own boxes. Until then, consumers should use these questions and manufacturers should provide honest answers to contextualise products. Because sometimes there are miles of sea, it seems, between a claim and reality – just ask Tavish Scott.

Report No. 18
GS Oberoi Inspired Map Awareness Programmes (MAPs)

Report of MAP (Map Awareness Programme) at Ocimum International School

Bowenpally, Secunderabad

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Report by Ocimum International School

A seminar was conducted by **Brigadier J.S.Ahuja** ,) and **Mr. GS Kumar** Retd Directors, Survey of India / Mapping 1 experts on 18thJanuary in our **Ocimum International School** campus from 11 am to 12 noon. The session was very interesting and gave the opportunity to learn many new things about map reading process. We find it as a very informative experience . Briefly below are some of the elements of the session.

- Some Selected students were given the following project:
  On the google map, locate your home and neighbourhood around 1 to 2 km in diameter.
  Print the map on an A4/A3 paper. Identify the new stores,buildings, and trees etc. that are not shown in the map and add those places.
- The students enjoyed doing the project during their winter vacation. Most of them presented their projects in 2D and 3D models.
- **Brigadier J.S.Ahuja** and **Mr. Kumar** visited our **Ocimum International School** on January 18th and facilitated us with thorough and detailed information about Maps, both manual and digital. They enlightened the children on how to read a map, symbols used on a map, directions, identifying the colours used and the pivot role that Maps can play in our day to day life.
- Students posed many questions and **Brigadier J.S.Ahuja** answered them in an interesting and enthusiastic way to encourage children. He also guided them the career options available in this field. The session ended by giving away merit certificates to the students.

We sincerely thank **Brigadier J.S.Ahuja** and his team for giving us an opportunity to participate in such kind of innovative projects. It was indeed an enriching experience. The expertise and flow exhibited in the subject was truly inspiring.

We humbly appreciate the efforts taken by them to improve education system in our Country.

Teachers attended: M.Meena Kumari. Ms. Apsara. Ms. Yasmeen.

Abstract/Extracts

3D accurate survey with smart phone

Surveying and Mapping with Your Smartphone

https://www.gim-international.com/content/news/surveying-and-mapping-with-your-smartphone

When we interviewed Professor Thomas Kersten back in 2014, he predicted that the smartphone would become a valuable surveying instrument within just a couple of years – and he was not far wrong! Thanks to the rapid pace of technical advancement, smartphone photogrammetry now enables us to capture reality in 3D. Some smartphones come with a 3D scanning application already integrated, while others can be turned into a 3D scanner by simply downloading an app.

…….smartphone photogrammetry now enables us to capture reality in 3D.

And who knows what the next few years will bring. Will we soon see smartphones equipped with a Lidar sensor – a 3D laser scanner in your pocket? At '*GIM International*', we've put together an overview of the broad range of relevant functionalities already offered by today's smartphones. Smartphones are omnipresent, and many people can no longer do without them. Smartphone cameras capture images suited for generating point clouds and 3D models. Apps running on smartphones and software running on a remote server enable easy 3D modelling from multiple images. The challenge is to train and guide laymen through a proper image capture strategy using their smartphones

Read on to find out how you can use your smartphone for a multitude of surveying and mapping applications. Some information/extracts/examples are given below:

1. Land Administration

The use of community participation, mobile technologies and cloud storage services could create a new way of undertaking land administration activities, and ultimately lead to more secure land rights for all. Sparked by these grand visions – which were first promoted by Robin McLaren, amongst others, in the late 2000s – alternative land administration platforms are now emerging, such as cadasta.org, landmapp.net and mobineo.org to name but a few.

In a fit-for-purpose approach, boundaries of parcels are identified in the field and drawn on plots of orthophotos using locally trained technicians. The approach is highly participatory. It has previously been implemented in countries such as Rwanda, Kyrgyzstan, Ethiopia, Lesotho and in some Eastern European countries. …. The use of smartphones, which are widely available in Africa, provides a unique opportunity as a fit-for-purpose process is possible without the need for a CLS to acquire extra equipment. Furthermore, while the approach used by conventional surveyors only registers the coordinates of the corners of land boundaries, this approach is suitable for mapping irregularly shaped farmlands.

(*Orthophoto based – photogrammetric survey with comprehensive LIS under BhuBharathi was successfully done for 6000 sq km in Nizamabad Distrit in 2008 at a cost of about Rs 200 per hectare involving private companies - Editor)*

With the growing mix of off-the-shelf and made-to-order land administration app offerings, the land sector and land professionals have an increasing number of options when undertaking the fit-for-purpose or pro-poor parts of their work.

1. Precisely Flexible Positioning
Pay-as-you-go Software-defined GNSS
John Stenmark

……..Even in good conditions, achieving an accuracy

of better than one or two metres is beyond the capability of consumer-style phones or tablets. Higher accuracy can increase the performance – and value – of location-aware applications, but the costs and complexity of high-accuracy GNSS solutions have presented barriers to entry for many potential developers and their customers….. With Trimble's Catalyst, users can obtain positions in real time with accuracy ranging from metre level down to two centimeters…….For years, professional-grade GNSS hardware has come at a price point that has limited access to high-accuracy positioning. But with Catalyst, cost is no longer a barrier to entry to those wanting to add GNSS to their workflows. By shifting the emphasis from hardware to software and cloud-based services, Catalyst is positioned to bring new users to the GNSS arena

2. Bluesky Uses Mobile Phones to Create 3D Maps

Aerial mapping company Bluesky has completed a research project backed by the UK government's innovation agency, Innovate UK, to develop the use of mobile phones for capturing accurate 3D spatial information. The nine-month investigation focused on the use of standard smartphone technology to capture and calibrate video footage, then convert it to 3D information. Accurate measurements of essential infrastructure, such as overhead power lines and other utility facilities, could then be extracted using specially developed algorithms and workflows

Aerial mapping company Bluesky has completed a research project backed by the UK government's innovation agency, Innovate UK, to develop the use of mobile phones for capturing accurate 3D spatial information.

The nine-month investigation focused on the use of standard smartphone technology to capture and calibrate video footage, then convert it to 3D information. Accurate measurements of essential infrastructure, such as overhead power lines and other utility facilities, could then be extracted using specially developed algorithms and workflows. Designed to provide an accurate record of the feature's location and its environment, the Bluesky project is expected to appeal to electricity Distribution Network Operators (DNO) and other organisations with a dispersed asset base, as a low-cost measurement and auditing tool.

3. Point Clouds from Smartphones

Cheap and Rapid 3D Modelling

Erica Nocerino, Fabio Poiesi, Fabio Remondino, Luc Van Gool

xxxxxxxxxxxxxxx

Images and videos captured by smartphone cameras can be processed by pipelines running on a remote server. This puts easy 3D modelling from multiple smartphone images within reach for applications such as 3D documentation and modelling in cultural heritage and the creative industry. Disaster management may also benefit from this approach for documenting, monitoring and inspecting hazardous environments.

4. Heritage Sites

Six off-the-shelf Android smartphones captured single or multiple video streams (Table 1) of three cultural heritage sites. Each site was captured by three smartphones by different users to simulate a collaborative 3D documentation approach. The first site, the 'Saranta Kolones' monument at Paphos, Cyprus, measuring about 16m x 16m x 5m, is on the UNESCO World Heritage list. The dimensions and complexity are major challenges. The videos were taken throughout the day resulting in varying lighting conditions (Figure 2). The second site was the north-facing façade of the cathedral on 'Piazza Duomo' in Trento, Italy, which has a length of 100m and a height of 30m (Figure 3). The third site was the south-facing facade of a painted building measuring 30mx15m and housing 'Caffe Italia' in Trento. These sites were simultaneously captured by three collectors (Figures 2 to 4). Challenges of these sites were the flat geometry of the facades and the presence of people, cars, trucks and other moving objects.

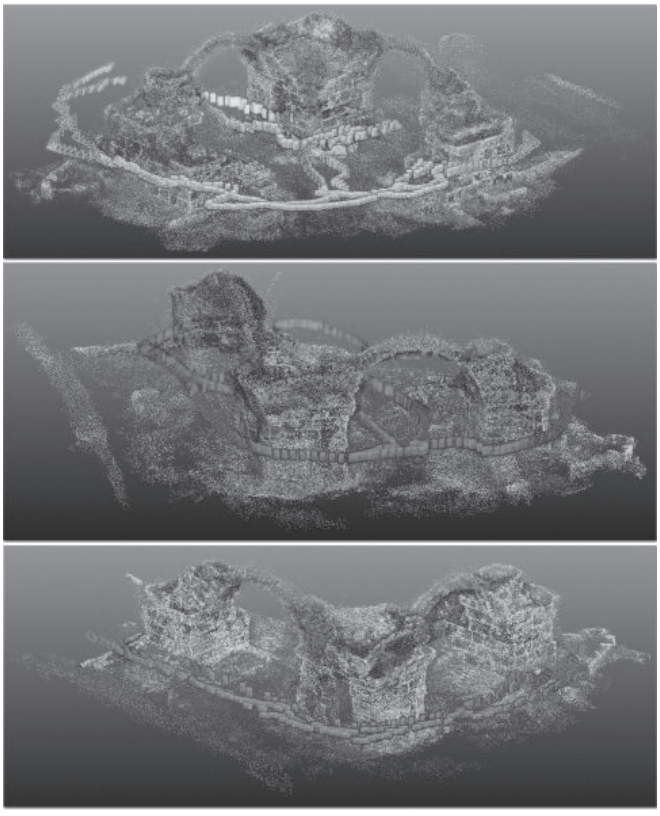
For the 'Saranta Kolones' dataset, 176 images were captured; it was possible to achieve a final root mean square (RMS) error better than 5mm computed on 20 checkpoints. For the 'Piazza Duomo' and 'Caffe Italia', 359 images were captured; comparison with 18 checkpoints resulted in an RMS error better than 10mm

Polygon-based rather than boundary-based

The data collection method is 'polygon-based' rather than 'boundary-based' (Figure 3). The collected polygons with associated attributes are considered to be 'evidence from the field'. Data collected from the field can be processed and handled in a (cloud-based) geographic information system (GIS), where the collected polygons can be superimposed onto the imagery. Between the polygons, the boundaries will be visible as objects in most cases: fences, hedges, trees, ditches, roads, etc. If those visible objects are not spatial units in themselves, the boundaries can easily be vectorised today and in the future it may be possible to conduct automatic feature extraction. Topology can be introduced if needed.

Imagery is loaded in advance. Most boundaries are clearly visible on aerial photos or on satellite imagery. This imagery should be 'ready to go', with proper cache levels, scales, formats, etc. ..... enabling everyone to follow the process remotely – this is important for the involvement of stakeholders who cannot be on site – and it is possible to set up transparent access to this cloud environment. Usual procedures, such as public inspections,

Bluesky using mobile phones to capture geospatial data



sparse point clouds of Saranta Kolones (coloured) generated from the three smartphones; grey inidcates the entire point cloud.

3D City Modelling Takes Development and Transf.

Astronautical Congress

71st International Astronautical Congress to take place in Dubai, United Arab Emirates from 12 – 16 October 2020. This will be the very first time that the world's premier global space congress will gather the international space community in the United Arab Emirates

The IAF is particularly proud to have as host organization, the Mohammed Bin Rashid Space Center, a very active member of the Federation since 2012. Moreover, given the substantial investments done in the Arab region towards space activities and the birth of many space-related organisations, the Federation looks forward to welcoming many more Arabic members in the years to come and surely hopes the IAC2020 will work as a catalyst in this respect.

2020 promises to be an exceptional year for Dubai which, in addition to the IAC, will also host the Expo 2020, a festival celebrating the human genius. As stated by Dr. Le Gall, "the Federation is confident that IAC 2020 will not only be a successful event with a record-breaking number of participants, but will also pave the way to fruitful discussions and to the involvement and inclusion of more Arabic countries in the space scene".

media@iafastro.org

A 195 Gigapixel Photo of Shanghai

http://www.ba-bamail.com/content.aspx?emailid=32313

The picture below may seem like just another panorama image of Shanghai, and it is, in a way. What distinguishes this image, at least when you look at it from the original source **here** (http://www.bigpixel.cn/t/5834170785f26b37002af46d), is that it is enormous.

It's so big and so high-definition that you would be able to make out shop names, license plate numbers and people taking selfies if you wanted to. And yes, we tried and found all of the above-mentioned things. When we first saw this image, several questions popped up in our minds:

Just how big is it and how was it created? Who shot it and, most importantly, why? In this article, we will answer these questions and share with you some of our and other website's best finds in this picture, some of which are just bizarre...

Just How Big Is This Picture?

Good-quality images are nothing new, but this picture brings high-definition to a whole new level. It is 195 billion pixels big. However, generally speaking, we measure image quality in megapixels, which makes this image 195.000-megapixel big.

For comparison, an excellent phone camera produces 12-megapixel images. Surprisingly, it's only the world's 3rd biggest picture. However, it is the biggest picture taken in Asia. The photo is a 360-degree panorama and offers a complete view of the city on a bright sunny day.

This lets the viewer zoom into any part of the image, changing the direction and the closeness of the image with either special handles or with hand gestures from touch-screen devices. And boy can you zoom in… As you can probably tell from these photos, the precision is so alarmingly high that it causes goosebumps.

How Was the Image Created?

The photo was taken from the city's second tallest point, the Oriental Pearl Tower. It was combined together from thousands of photos taken by ordinary cameras with special lenses that can capture close up images.

The creators used a special image-stitching technology, and all in all, they combined 8,700 photos together. The final product occupies 2.6 terabytes of memory.

Who Created This Photo and Why?

This is by far the most controversial subject. The image was created in 2015 by a Chinese company called Bigpixel Technology to let people from all corners of the Earth see the city close-up.

Sadly, the photo was made popular by western media sources in 2018 under a false story. What popularized the picture was a classic example of scare tactics. The media spread rumors about the photo being a test of a Chinese spying device, mounted on a satellite using "quantum technology".

And in a sense, they are right, as being able to zoom in to someone's facial expression while they are eating lunch can be considered spying. Jokes aside, not by any

stretch of the imagination, the possession of such technology could very well be used in all kinds of purposes, including spying.

And even if we trust hi-tech companies not to sell this kind technology to potentially-dangerous agencies, this photo itself can already be considered an invasion of privacy.

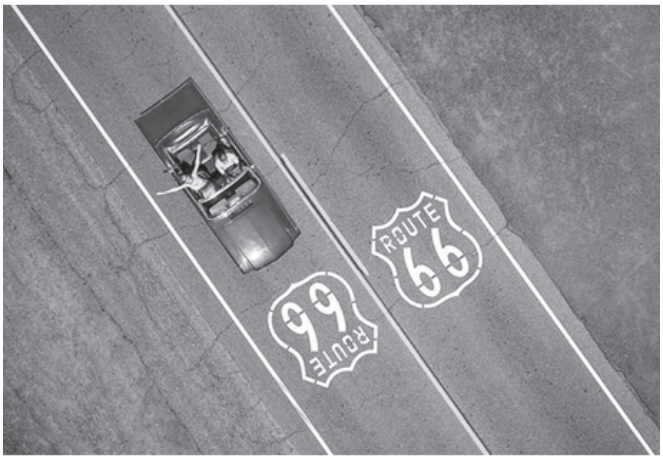
No matter what your stance is on the morals of the matter, we hope you enjoyed this article. We write a lot about all sorts of amazing photography and technological advancements, so here's a random taste: **Teach Kids to Use Technology Wisely** and **14 Impressive Moments That Scientists Have Documented**.

The Best Pictures on Dronestagram in 2017

http://www.ba-bamail.com/content.aspx?emailid=28405

Dronestagram is an online community of photographers from all over the globe that specializes in drone photography. The website receives thousands of shots per day because it allows everyone to share their drone photographs with the rest of the world. In addition, Dronestagram holds an annual competition to find the very best drone photographs of the past year. Here are some breathtaking finalists from 2017:

Blue 'stang on the Route



GIS Market *Contd.....7*

- Market segmentation analysis

Market Sizing

- Market definition
- Market size and forecast

Five Forces Analysis
Market Segmentation
Geographical Segmentation

- Regional comparison
- Key leading countries

Market Drivers
Market Challenges
Market Trends
Vendor Landscape

- Vendors covered
- Vendor classification
- Market positioning of vendors
- Competitive scenario

About Technavio

Technavio is a leading global technology research and advisory company. Their research and analysis focuses on emerging market trends and provides actionable insights to help businesses identify market opportunities and develop effective strategies to optimize their market positions.

With over 500 specialized analysts, Technavio's report library consists of more than 10,000 reports and counting, covering 800 technologies, spanning across 50 countries. Their client base consists of enterprises of all sizes, including more than 100 Fortune 500 companies. This growing client base relies on Technavio's comprehensive coverage, extensive research, and actionable market insights to identify opportunities in existing and potential markets and assess their competitive positions within changing market scenarios.

If you are interested in more information, please contact our media team at **media@technavio.com.**

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Alternative maps of human history

New maps and new ways of reading maps give us a new geography of human suffering and extinction

Facebook Twitter Google+ LinkedIn Pinterest

By Pramod K Nayar | Published: TelanganaToday 13th Feb

There are new maps of the world, but not the kinds we have been used to thus far: from Mercator's Projection and portolan maps to the present. Maps help us locate countries, peoples, languages, routes, products, animal and plant life, monuments and other such components of life on earth. In some cases, they give us histories of a kind that we wish never happened.

Far from the maps we are used to, alternative maps of human history are now available. However, we are not talking Google Earth alone, whose politics sees, Joshua Ewalt notes, 'embedded violence' as integral to the African continent.

Desperate Journeys

Take a look at the Refugees Operational Portal from the United Nations Refugee Agency

(https://data2.unhcr.org/en/situations/mediterranean).

The map shows us arrivals in Europe of refugees fleeing terrifying regimes. It links to crucial documents such as the series Desperate Journeys. In the new issue released on 30 Jan 2019, we are told: An estimated 2,275 people perished in the Mediterranean in 2018 - an average of six deaths every day.

It tells us that 7,421 refugees had arrived by sea till 12 Feb in 2019 alone. It tells us how many arrived dead and how many went 'missing at sea'. Geography lessons clearly need to be redone in the light of those who arrive, dead or alive, from countries and regions where human life is unsustainable.

Maps of Camps

Then there are maps of camps in various parts of the world where various categories of foreigners, aliens, strangers and outsiders arrive, are made to feel unwanted, even as those have lived in these regions for generations suddenly find themselves missing from NRC (National Register of Citizens) maps and other state modes of census taking. In some parts of the world, maps of rape camps (such as those in Sudan) tell us that maps, like borders, divide the land, and the people.

We need new maps and new ways of reading maps. Hotspots, sites of genocides and violence are also to be mapped onto the latitudinal and longitudinal grids we learn from our school days. This kind of map offers us an entirely

These maps are cultural products whose task is to identify places where humankind lives an inhuman life, as a preliminary to ethical action

different view of the world. In contrast to, say, the 'map of mankind' that shows us evolution from 'out of Africa' to the present or our civilisational progress, we have a new geography of human suffering and extinction, as the anthropologist Veena Das proposes.

Linguistic Map

Other trajectories in maps are also visible today. The Sentinel Project (https://thesentinelproject.org) after mapping contemporary and ongoing genocidal violence and the initiatives taken by NGOs in these hotspots of the world offers us an extraordinary map of the contemporary: a repository of hatespeech. Called Hatebase, 'it is an attempt to create a repository of words and phrases that researchers can use to detect the early stages of genocide and remains in active development' (https://thesentinelproject.org/2018/10/26/hate-in-every-language-we-need-your-help/).

The Open Source software enables researchers to map misinformation, keywords that indicate hatespeech, rumours and other linguistic acts that presage genocide and violence. It seeks to document hatespeech in as many languages as possible, offering, thereby, a new linguistic map of the world. We understand that *any*language is capable of hatespeech.

These maps, like traditional maps, are modes of representation, but unlike the traditional map, they do not rely exclusively on visual representations. Incorporating sounds and human faces that stand in for the spaces they live in or came from, for example, ensures that the human face is a map of a culture of suffering. Conversely, maps of the world's hotspots tell us where human life is no longer liveable.

Cultural Productions

The map, the myth goes, is objective and scientific. But maps, as JB Harley demonstrated in his pioneering essay, 'Deconstructing the Map' (1989), are not just scientific texts but cultural productions: they are created within specific social and historical contexts of which the scientific laboratory is *one* component: 'we have to read between the lines of technical procedures or of the map's topographic content. They are related to values, such as those of ethnicity, politics, religion, or social class, and they are also embedded in the map-producing society at large.'

Harley is right – scientific knowledge, including cartographic knowledge, is influenced by and embedded in numerous contexts. When, for instance, a culture created maps of the world, it positioned specific regions at the centre and the rest of the world around the peripheries. The Hereford Mappa Mundi (14th century) placed Jerusalem at the centre. The 1602 Ricci map, created by European Jesuit mission led by Matteo Ricci and the Chinese scholars imperial court, placed China at the centre. Evidently, the map's locational accuracy is subordinated to the political expediency of claiming the superiority of the culture that crafted the map. These maps were instrumental in generating specific views of the world.

A Different Agenda

Given this history, contemporary maps – which now include digitally archived data such as the ones discussed here – emerge from not the scientific community alone. They must be read as productions determined by a very different agenda: human rights. Thus, the focus on deprivations of refugees, the horror of rape camps or the proliferation of hatespeech in these modern 'maps' are alternative histories of these spaces.

These maps of the world are cultural products whose task is to identify places where humankind lives an inhuman life, as a preliminary to ethical action. They constitute a form of globalisation directed at the mobilisation of public sentiment and public support to alleviate misery. Admittedly, the humanitarian movement is also a form of imperialism (as many scholars including Noam Chomsky have argued).

But if we see globalisation as neo-colonial and governed by commodities and the transnational movement of capital and images, the new cartography asks us to see the world as a place for potential ethical intervention, prevention and recuperation. Globalisation brings the distant to us via the screen which, as media theorist Roger Silverstone put it, 'is the space of the appearance of the Other'. These maps bring us different Others.

(The author is Professor, Department of English, University of Hyderabad)

Mohan's Musings

Contd...6

Does Precision influence accuracy?

A measurement system can be accurate but not precise, precise but not accurate, neither, or both. For example, if an experiment contains a systematic error - such as a weighing scale in a weight-loss centres :) , then increasing the sample size generally increases precision but does not improve accuracy.

Map accuracy:

The closeness of results of observations (or computations, or estimates) of graphic **map** features to their true value or position.Map accuracy is verified by comparing the positions of map point elevations or locations with corresponding positions as determined by ground surveys of a higher accuracy. However, they differ by the statistical means and methodology utilized in presenting the measurement errors.

In India, the map positional accuracy is represented as fraction of map scale viz., 0.25mm * map number. Example: in 1:25000 scale maps, the accuracy is 6.25 m (= 0.25 mm * 25000). And the vertical accuracy is expected to be half of the contour Interval.

In **GIS data**, **accuracy** can be referred to a geographic position, but also to its attributes, or conceptual **accuracy**. Precision refers how exact is the description of **data**. As discussed earlier, precise **data** may be inaccurate, because it may be exactly *described* but inaccurately gathered.The possibilities include:

Position is correct but attributes are wrong. Example: The location of a lamp-post is correctly depicted but attributed as telephone pole.

Position is inaccurate but attributes are correctly described: Example: If you move meridians in a map by an arc-second, all the features are measured wrong by about 30 meters in longitude.

Both position and attributes can go wrong. Example: A spot height wrongly located and attributed with a wrong elevaation value.

ISO (International Organization for Standardization) is an international standard-setting body composed of representatives from various national standards organizations. Visit their wiki page for elaborate treatment on these. Also refer to mapping standards of NMAS, ASPRS, EuroSDR(erstwhile OEEPE), NNRMS,.. for eloborate guidelines of mapping standards.

OBITUARY

Reporting with a heavy heart deaths of some senior Survey of India officers (Map experts). I wish to thank Mr. GS Oberoi, President, All India SOI Retd officers Assn, for mailing the information- gurbakshsoberoi@yahoo.co.in *- Editor*

SD Baveja

From Mr. GS Oberoi, Retd. Director, Surveyof Ondia - 3 Feb 2019 (by email)

Dear friends,

I have just received a message from Shri SP Goel that Shri SD Baveja, Retd. Director of the department, breathed his last yesterday.

I am very sorry to hear this sad news. I had known him for long, as a good friend and colleague.

May his soul rest in Peace!

His Tel. No. available with me is +919810202907(M).

GS Oberoi.

J. Narsimhan

Fri, 22 Feb 2019

Dear friends,

I have just learnt that Shri J. Narsimhan, Retired Director of Survey of India has passed away. I have no other details about his death.

I had known him as a good friend and colleague for over 60 years.

He was a thorough gentleman, truly religious and a sincere friend. A true, honest and competent officer who was respected and loved by all who knew him.

The department has lost a veteran in him.

I will miss him for long.

May his noble soul rest in Peace!

I send my condolences to all his children whom I have known for many years. May God give them strength to bear this loss! The telephone No. of his daughter, Kamala, is +91 9911987747(M).

Yours in Grief,

GS Oberoi, Noida.

Copy to Ms Kamala d/o Late Shri Narasimhan.

Very sad News in-deed...

The good qualities expressed were deeply rooted in him.

A thoroughly Gentle man with positivity ...

May he gets Sadhgati / Mukti - Moksh.

Om Shanti Shanti Shanti ...

With prayers :

SP Goel.

Dehradun.

** I attended his father's funeral from Dehradun to Haridwar in 1978 or so. We were residing in Hathi Barkala Estate in Dehradun.**

OP Bakshi

Dear friends,

I am forwarding a note sent by Shri S P Goel to me.

Feeling sad to hear about Shri O P Bakshi, Retd. Superintending Surveyor's demise. I had known him as a good colleague and friend. May his soul rest in peace!

GS Oberoi.

Shri SP Goel's note:-

'Came to know that Mr OP Bakshi expired around 01st Feb. 2019 in Dehradun.

He was residing with his nephew and Bhabi in Dalanwala, Dehradun.

He was a bachelor ..

Om Shanti Shanti Shanti ..

SP Goel.'

EVENTS

QGIS Developer Meeting	March 7 – 10, 2019	A Coruña, Spain	http://2019.qgis.es/
EUROGEO 2019	March 14-16 2019	Paris, France	www.eurogeography.eu/conference-2019
Geospatial World Forum 2019	April 2-4 2019	Amsterdam, The etherlands	www.geospatialworldforum.org
UAV Expo Europe	April 8-10 2019	Amsterdam, The Netherlands	www.expouav.com
Future Cities Show 2019	April 8-10 2019	Dubai, UAE	https://www.gis-professional.com/content/event/future-cities-show-2019
Ocean Business 2019	April -11 2019	Southampton, GB	www.gis-professional.com/content/event/ocean-business
Geology and Earth Sciences	April 10-13 2019	Valencia, Spain	geoscience.madridge.com/
FIG Working Week	April 22-26 2019	Hanoi, Vietnam	www.fig.net/fig2019
GISTAM 2019	May 3-5, 2019	Greece	www.gistam.org
Information Fusion & GIS	May 10 – 12, 2019	St.Petersburg, Russia	
International Symposium on Deformation Monitoring	May 15 – 17, 2019	Greece	isdm2019.survey.ntua.gr/
GEO Business 2019	May 21 – 22, 2019	London, UK	www.geobusinessshow.com/
Urban Remote Sensing Event	May 22 – 24, 2019	Vannes, France	www.jurse2019.org
UAV-g 2019	June 10 – 12, 2019	Enschede, The Netherlands	www.gsw2019.org
Geospatial Week	June 10 – 14, 2019	The Netherlands	www.isprs.org/
Geo Information for Disaster Management	September 3-6, 2019	Prague, Czech Republic	www.gi4dm2019.org
INTERGEO 2019	17th – 19th September 2019	Stuttgart, Germany	www.intergeo.de
International Symposium on Digital Earth	September 24-27, 2019	Sesto Fiorentino Italy	www.gis-professional.com/content/event/11th-international-symposium-on-digital-earth-isde-11
InfraTech 2020	14-16 January 2020	Germany	https://www.infratech.de

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

Humor

Discussing violations