

“MISCLOSURES” NEWSLETTER



Website: www.lsjaj.com

Land Surveyor's Association of Jamaica Newsletter

July, 2021

The Need to Enthuse Youngsters about Surveying



By: Wim van Wegen

It was only after several years of working in the geospatial industry that I became adept at explaining – briefly and insightfully – to people at networking events, parties or even in my local pub precisely what the sector does. Clearly, we still have our work cut out to put our profession on the map. Even though geospatial data and geospatial technologies have become pervasive and indispensable in today's highly developed society, we still struggle to make others adequately aware of this. Worryingly, the number of school-leavers choosing to study geomatics study is lagging behind, despite the desperate need for new survey and mapping professionals in the years ahead.

I'm not the first person to make this observation, and it's not the first time I've raised this issue either. But in view of the challenges our planet is facing – such as the energy transition, for example – and the opportunities presented by digitalization, we urgently need to increase our focus on the next generation. After all, the youngsters of today are the geospatial professionals of tomorrow.

It is encouraging to see a number of recent initiatives that are raising children's awareness of how cool surveying can be. One such initiative is 'Get Kids into Survey', whose mission is 'Engaging, educating and empowering future surveyors to take on the challenges of the tomorrow, bettering the geospatial industry for all'. Elaine Ball and her team are contributing to a geospatial-aware generation, including by developing online resources, school events, career days and engaging learning materials, as well as a series of amazing posters. Meanwhile, in Germany, a children's book has been published called *Ich hab eine Freundin, die ist Geodätin*. It tells the story of Jule who wants to be a geodesist when she grows up. When her family are preparing to move into a new house, the geodesist teaches Jule how a building is staked out and later measured, how heights are levelled and how a map is created. The

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Contact the LSJAJ:

The Trade Centre
The Harry G. Armstrong Suite
Unit #9A
30-32 Red Hills Road, Kingston
10, Jamaica
Tel.: 876-754-6912-3
Fax: 876-920-3650
Website: <http://www.lsjaj.com>
E-mail: lsaj.jam@gmail.com

Editor's Notes



Timothy A. Thwaites BA, MSc., CLS

Dear readers, welcome to the fifth COVID-era edition of *Misclosures*! The stubbornness of this pandemic and its side effects would easily lead us to believe that our worlds are at a standstill, however nothing could be further from the truth.

The very restrictions that seem static are themselves changes; and we hope that they too will soon also change. Nothing will be the same; but if we think about it, nothing was ever going to stay the same!

Uncertainty can be worrying, but seen through a different lens it can be filled with opportunity. We may not know what the surveying of tomorrow will look like, but we're in a great position to help shape it, and to position ourselves to be its main beneficiaries.

The dizzying pace of technological change is something most are now accustomed to, this part of our future is well researched, developing, and chronicled in copious inches of journal and periodical literature.

Of more urgent concern, and arguably more difficult resolution, is the future of the surveyor as an individual. The realities of surveying and the general disposition of the millennial can appear to be diametrically and hopelessly disconnected. However, before we despair, let us cast our memories to when each of us in turn were seen in a similar light by our predecessors. I've recently read research on this phenomenon known as 'generational amnesia', or the 'kids these days' effect, wherein we seem to forget the challenges we ourselves caused, and indeed overcame to achieve our current statuses.

Much like COVID related changes, we will have no choice but face the challenges of next generation head on, and to bridge the existing gaps; our own futures, and the future of the profession demands it.

To attract, develop and retain the talent we require for success and succession, surveyors and their businesses must become proactive, outward facing, organized, transparent, dynamic and inspiring, all while offering attractive opportunities, and realistic paths for advancement. Let us embrace this challenge!

Timothy A. Thwaites, Newsletter Editor

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The LSAJ continues to be more environmentally responsible! Our *Misclosures* newsletter will now only be circulated in electronic format. This will increase our reach through e-transmission to a wider readership, and also drastically reduce our collective carbon footprint!

The President's Notepad



Christopher Grant, CLS - LSAJ President

Colleagues, students, friends and well-wishers, we welcome you to the third quarter of 2021. We continue to endure an eventful period in our history. Our world continues to transition in front of our eyes. There are lots of bankruptcies and prospective bankruptcies, new opportunities, increasing fears, cautions and even exploits to make space an alternative abode. I hope that you share my excitement and intrigue. In reading the various quarterly reports of various entities, especially those concerned with economic and financial matters, we mostly see reports of losses, downsizing and increased prices. This of course is due primarily to the ongoing pandemic which has so far stubbornly refused to depart from us. In the case of the industry of which we form a part, the news is quite the opposite. The industry continues to experience growth, notwithstanding the significant increases in the price of building materials and other commodities. Wherever the dust settles, I trust that Land Surveyors are properly aligned to enable their continued participation in this global revolution.

During the past quarter we received the results of the 2020 Land Surveyors Board Examinations. We congratulate the two successful candidates; Mr. Nicholas Weller and principal, Mr. Andrew Gracey as well as Mr. Keith Wignall and principal, Mr. Llewelyn Allen. We commend you for your commitment and endurance. We have no doubt that the profession of Land Surveying in Jamaica will be enriched by your contribution. We look forward to your lasting impact. For the candidates who were not successful this time around, we urge you to focus on those areas of greatest weaknesses. Seek assistance to aid your improvement and reapply for another sitting. Remember, there's no such thing as failure, it's just an outcome which varied from the one you anticipated. If you missed the lessons that emanated from this result,

then you would've failed.

Covid-19 continues to be the dominant factor impacting our daily existence. We're stuck behind masks and distanced from each other while we gingerly pursue the miracle vaccine which will return our lives to what we know as normal. These are matters over which we currently have limited control. Let's not worry about the things we can't control and start focusing on the things we can. Today is the day we free ourselves from fear. Let's seize the day and take effective action on things that are within our control.

Have an enterprising and safe quarter.

Christopher Grant, President

'Which of you by taking thought can add one cubit unto his stature' Matthew 6:27



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Belgian farmer accidentally moves French border

A farmer in Belgium has caused a stir after inadvertently redrawing the country's border with France.

A local history enthusiast was walking in the forest when he noticed the stone marking the boundary between the two countries had moved 2.29m (7.5ft).

The Belgian farmer, apparently annoyed by the stone in his tractor's path, had moved it inside French territory.

Instead of causing international uproar, the incident has been met with smiles on both sides of the border.

"He made Belgium bigger and France smaller, it's not a good idea," David Lavaux, mayor of the Belgian village of Erquelinnes, told French TV channel TF1. That sort of move caused a headache between private landowners, he pointed out, let alone neighbouring states.

The border between France and what is now Belgium stretches 620km (390 miles). It was formally established under the Treaty of Kortrijk, signed in 1820 after Napoleon's defeat at Waterloo five years earlier. The stone dates back to 1819, when the border was first marked out.



"I was happy, my town was bigger," the Belgian mayor added with a laugh. "But the mayor of Bousignies-sur-Roc didn't agree."

"We should be able to avoid a new border war," the amused mayor of the neighbouring French village, Aurélie Welonek, told La Voix du Nord.

Local Belgian authorities plan to contact the farmer to ask him to return the stone to its original location. If that does not happen the case could end up at the Belgian foreign ministry, which would have to summon a Franco-Belgian border commission, dormant since 1930.

Mr Lavaux noted that the farmer could also face criminal charges if he failed to comply.

"If he shows good will, he won't have a problem, we will settle this issue amicably," he told Belgian news website Sudinfo.

Source: <https://www.bbc.com/news/world-europe-56978344> (accessed 04-07-2021)

Surveying And GIS: 'And', Not 'Or'



By: Brent Jones, PE, PLS

When I graduated from college several decades ago, a retiring drafting professor said to me, "The things that are going to change during your career are difficult to comprehend. I wish I was going to be around to be part of it."

It was a long time ago. In school, we worked with experimental GPS satellites, tried to understand object-oriented programming, and worked with mainframes attempting to build computer-mapping systems. We programmed relative and absolute adjustments for aerial photogrammetry and experimented with close-range using 35mm film cameras.

We were lucky to have one of those old clunky HP EDMs to use. We used transits and field books for land surveying classes. Law classes covered everything from the Colonial Ordinance and Jefferson to the rules of evidence and the PLSS. I attended the ACSM (American Congress on Survey and Mapping) conference with over 3,000 attendees. Since then, everything has changed exponentially, except the law.

Surveyors have a rich history that is highlighted in almost all surveying magazines with incredible stories ranging from alligators encounters to scaling the highest mountains in the world. What comes along with a surveying career is difficult to capture in a short sentence, but it fundamentally involves collecting and analyzing data, applying legal and scientific principles, and making judgments and issuing opinions. It involves delivering trusted products to clients who rely on them and enduring all of challenges of the physical world to make it happen.

This hasn't changed, but the tools and techniques have. In fact, the tool - box is overflowing so much that nearly everyone is using some of them, and new professions have emerged that take advantage of these new tools by doing new things.

Market economies have a habit of creating specialties. More mature economies have high degrees of specialization and less mature economies have lower degrees of specialization. We can see this in all elements of the economy. For those of us with a little age, we are finding out there are types of doctors that we've never heard of. There are restaurants of every type. There are engineers for just about everything you can think of from chips to ships. There are shops that only change your oil and companies that deliver sausage to your door.

Specialization is part of capitalism. New opportunities are created from a wide variety of circumstances from invention and infrastructure to convenience and comfort. Market efficiencies are created through specialization.

Some specializations are focused, like processing lidar data or using artificial intelligence with satellite imagery to determine the amount of land in agriculture use. Other specializations combine several technologies like collecting street-level imagery, GPS, and lidar to produce applications for data collection and visualization.

Even other specializations use this collected data and apply machine-learning tools to extract the locations of fire hydrants, utility poles, and any feature the imagery and lidar can observe. These specializations create massive efficiencies for government and the private sector. Sharing this data publicly is a force multiplier to these efficiencies.

The tools used are in the surveyor's toolbox. But these tools are in the toolboxes of others, too. Policemen use total stations for accident scene mapping, foresters use GNSS to map the location of trees and forest plots, autonomous driving cars use lidar, and nearly every mobile device has GNSS for use in a limitless list of apps, from reporting pothole location to optimizing driving routes. Inherent in its name, GIS (Geographic Information Systems) uses more spatial or geospatial

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tools than most other industries.

GIS evolved leveraging other technological advancements along with innovation in GIS itself. Data from all sources — lidar, imagery, GNSS, drones, crowdsourcing, census, traffic, and many others combined with the rapidly evolving computing infrastructure, including cloud, mobile web services, big data, distributed computing, artificial intelligence, machine learning, and integrated with GIS innovation such as real-time data management, advanced analytics, visualizations, and mapping in 2D, 3D, and 4D deliver a market specialization that has created new opportunities, new industries, and a new profession.

In land surveying its complicated to collect and analyze data, apply legal and scientific principles, and deliver judgments and opinions. It’s also complicated to understand all the data types, projections, datums, databases, geodatabases, web services, cartography, apps, dashboards, portals, parcel fabrics, modeling, and all the methods of spatial analysis. A lot of the tools used by land surveyors and GIS professionals are the same, and that’s OK. It’s an ‘and,’ not an ‘or.’

One of the challenges with a new and rapidly growing professions is defining exactly what it encompasses. As new technologies, tools, and capabilities are used, what it encompasses grows and evolves. Surveying continues to grow and evolve. GIS continues to grow and evolve.

With long-established professions, registration and licensure are institutions to demonstrate minimum competence. With land surveying, this is done by the states. With relatively new professions that involve specific technologies, demonstration of minimum technical competence is often done with national certifications. Notably are CST (Certified Survey Technician), CFedS (Certified Federal Surveyor), CP (Certified Photogrammetrist), and GISP (GIS Professional). CST and CFedS are sponsored by NSPS (National Society of Professional Surveyors), CP is managed by ASPRS (American Society of Photogrammetry and Remote Sensing), and GISP is sponsored by the GISCI (GIS Certification Institute). GISCI is comprised of several member organizations — AAG (American Association of Geographers), NSGIC (National States geographic Information Council), UCGIS (University Consortium of Geographic Information Science, GITA (Geospatial Information and Technology Association), and URISA (Urban and Regional Information Systems Association).

It’s notable that these professional associations sponsor these professional certifications. Each of these organizations represent specific professionals. Just as there overlap in the use of tools, perhaps ‘geospatial tools,’ there is overlap with geospatial professionals and what their certifications/licenses demonstrate as minimum competence, and the services they can provide. There are differences what opinions and judgments are made from data collected. Among other products, land surveyors give legal opinions for decision making, and GIS professionals deliver analysis, modelling, and visualization for decision making. Overlap, but different.

Professions have evolved and new professions have emerged. Professional associations are growing and evolving to meet new professional challenges. Some surveyors are members of both URISA and NSPS. Some licensed professional land surveyors are GISPs. Some state land surveyor organizations welcome GISPs as peers to professional land surveyors. Just as we share some of the same geospatial tools, we share some of the same business challenges and our professional organizations help us with resources, certifications, and networking opportunities to address them.

This is only the beginning. Specialization is how market economies mature and grow. Predicting the future is difficult, but change is a certainty, and it will only accelerate. There will be new tools for existing professions, and new professions will emerge. There will be overlap, and that’s OK.

Source: xyHt July, 2021 Digital Edition—<https://bt.e-ditionsbyfry.com/publication/?i=710764> (Accessed 04-07-2021)

UAS Mapping – Where Is It Heading?



By: Mathias Lemmens

The use of an unmanned aerial system (UAS) – cameras and Lidar sensors mounted on an unmanned aerial vehicle (UAV or ‘drone’) – to acquire geodata for mapping purposes has evolved beyond infancy and is now rapidly maturing. How will UAS mapping evolve in the foreseeable future? To envisage where exactly UAS technology is heading, it is appropriate to start with the big picture before examining the details.

So what is the current big picture for unmanned aerial systems? How are they embedded in today’s society? First of all, our planet is confronted with climate change. The most threatening effects are sea-level rise and lengthy heavy rainfall putting valleys, rivers, lowlands and deltas at increased risk of flooding. Each year, the world’s population expands by more than the equivalent of the total number of inhabitants in Australia and Canada combined. Less than 250 years ago, just one billion people were living on this planet. Today, that number has reached nearly eight billion. This represents an annual population growth rate of over 1% and a doubling of the population every 70 years – which is less than a lifetime for many people. Remember this when you complain about overcrowded cities!

The Industrial Revolution brought the world machinery to plough, sow and harvest fields – which freed peasants from hard labour on farms, but also transformed smallholdings into industrial operations and signalled the end of the idyllic pastoral scenes immortalized in 19th-century paintings. Since then, those peasants’ descendants have continued to move around in search of work, contributing to the rapid growth of urban agglomerations. The resulting – and ongoing – societal developments have continuously increased the need for highly detailed, accurate and timely spatial data. This ever-evolving landscape forms the backdrop for examining where UAS mapping is now heading.

Persuasion skills

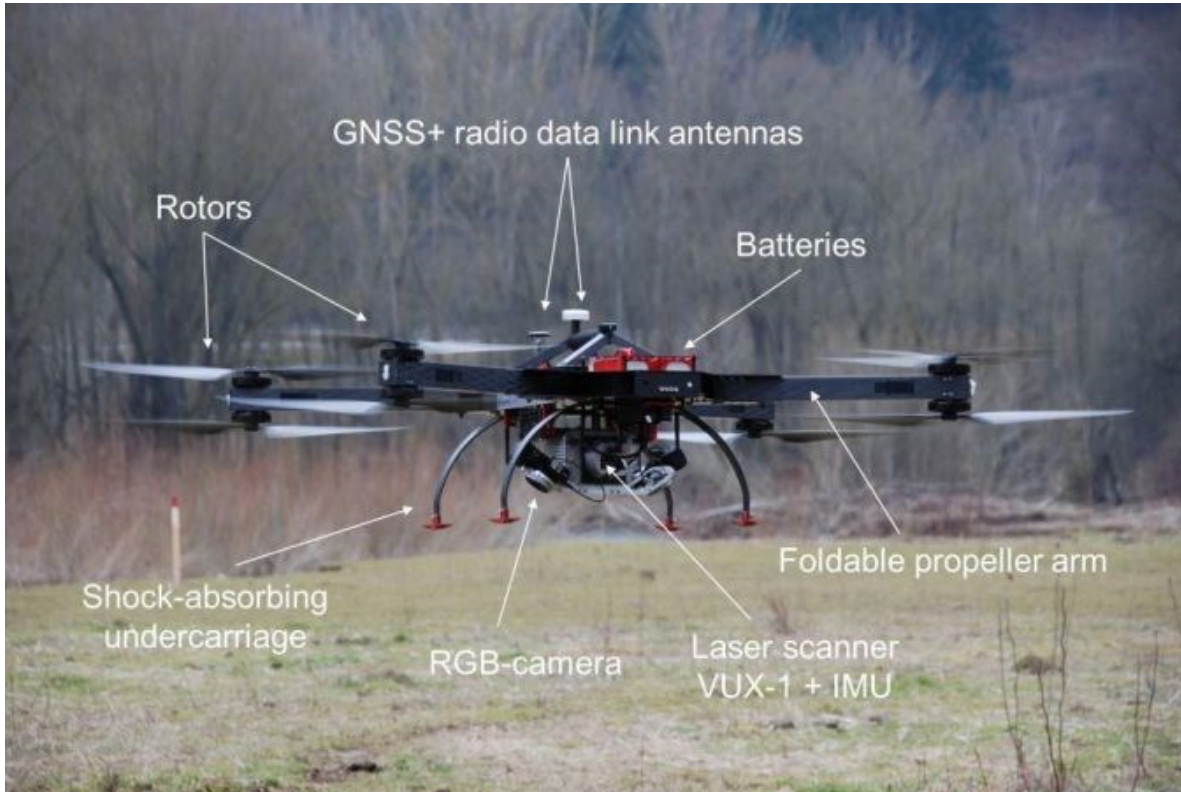
The main spatial data acquisition technologies for detailed 3D mapping of sites are based on imaging devices (photogrammetry) and Lidar sensors (laser scanning). The processing software to extract meaningful information from the data is greatly supported by the achievements of the computer vision research community over the last four decades. The major semi-finished products are point clouds. Cameras and Lidar sensors can be mounted on a wide variety of platforms or carriers, including vehicles and aircraft. Platforms operating outdoors, such as manned aircraft and cars, are usually equipped with GNSS and an inertial navigation system (INS) to accurately determine the six exterior orientation parameters of the sensors (3D position and orientation of the sensors in space). To improve reliability of georeferencing, additional sensors are often used such as wheel counters and compasses. The use of ground control points further enhances the geometric accuracy of the data. Thanks to simultaneous location and mapping (SLAM) algorithms, indoor mapping has become possible using trolleys, backpacks or handheld solutions. The decision for a specific platform depends on the application, size of the survey area, severity of disruption to human activities (e.g. interference with train timetables), required accuracy and level of detail, costs, instruments available at the surveying firms and the ability of those firms to communicate the benefits of their solutions to potential customers.

Miniaturization

On the flip side of societal developments are the technological advances. The key trend in the evolution of UAS mapping can be summarized as the miniaturization of components. Cameras and Lidar sensors suited for capturing high-quality data are becoming smaller and lighter, propped up by advanced processing software which facilitates the use of calibrated metric cameras and heavy Lidar sensors for precision solutions. Today’s positioning and orientation systems (POS) based on GNSS and INS can be held in the palm of one’s hand. The miniaturization of rotors, electric engines and batteries, in combination with carbon-fibre frames, has enabled the construction of lightweight UASs without compromising air stability. On such systems, camera(s) and Lidar (sensors) can be mounted abreast for the simultaneous capture of images and

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Lidar point clouds. Concurrent capturing of Lidar point clouds and photogrammetric images has proven to be beneficial for 3D mapping of built-up areas.



Due to ongoing miniaturization copters are able to carry camera and Lidar sensors simultaneously.

Hot spots

As illustrated by the numerous case studies published in GIM International in recent years, the UAS has proven its suitability for many 3D mapping applications, including at archaeological sites, industrial complexes, power stations, open-pit mines and construction sites. The use of UASs for capturing such sites will continue to flourish. Particularly, UAS photogrammetry is routinely used for mapping, inspection and monitoring of such sites. The projects concern individual buildings, small areas of interest and other isolated outdoor sites. Vast areas, such as urban agglomerations, are usually three-dimensionally mapped by selecting one geodata acquisition technology (often aerial photogrammetry) for the entire territory. That means all spots are treated equally. However, it is not always a case of 'one size fits all'; some spots are more equal than others. Choosing one technology based on the greatest common denominator results in a dataset in which some spots are captured at the right level of detail while others are over-detailed or under-detailed. By complementing a UAS with trolley-based, backpack or handheld mobile mapping systems, under-detailed spots can be captured at the desired level of detail.

Circular economy

The ongoing miniaturization of carriers and sensors in conjunction with SLAM algorithms for positioning and orientation purposes has also made it possible for copters to manoeuvre through indoor spaces. Equipped with cameras and/or laser scanners, they can collect high-density point clouds. The high level of detail and accuracy of the data helps facility managers to inspect their property. It also supports the creation of 3D cadastres, which are aimed at recording the ownership of volumetric parts of buildings and other constructions. Authorities and citizens alike are convinced that wasting

The Need to Enthuse Youngsters about Surveying (cont'd from pg. 1)

book – which I picked up from one of the countless booths at a previous edition of Intergeo – succeeds in showing the versatility of surveying and geodesy. Talking of Intergeo, that is exactly the kind of event that school pupils should visit because I'm sure they would be fascinated and inspired – not only by the survey technology and solutions, but also by the innovative applications presented on video screens or even in virtual reality.



Dutch company Geomaat recently organized guest lessons for older primary school pupils to give them a taste of the surveying profession. (Courtesy: Geomaat)

Here in the home country of GIM International, the Netherlands, we have GeoFort: an educational geo-experience centre where children can learn about geospatial techniques in a fun, hands-on way. Additionally, Dutch company Geomaat recently organized guest lessons for older primary school pupils to give them a taste of the surveying profession. The pupils even got the chance to use a total station. According to Geomaat, it is important that we tell children about technology and the role of surveying at an early age, and I couldn't agree more. As an industry, we should all make a serious effort to enthuse the new generation about the amazing world of geomatics. Will we ever succeed in turning surveyor or geospatial professional into a dream job for children, along with firefighter, jet fighter pilot, pop star or professional football player? It's got to be worth a try!

Source: <https://www.gim-international.com/content/article/the-need-to-enthuse-youngsters-about-surveying>
(accessed 04-07-2021)

UAS Mapping – Where Is It Heading? *(cont'd from pg. 8)*

fuel and other resources as well as the emission of harmful substances should be minimized through reuse, refurbishment and/or the use of alternatives in pursuit of the circular economy. The main consequence is that sites where humans are active, including agricultural lands and mines, need to be mapped and monitored in ever-greater detail. Within today's industrial agriculture, for example, the collection of spatial data supports regular inspections to avoid waste of fertilizers, fuel, seeds and water. A UAS is well-suited for capturing such spatial data on a regular basis. When it comes to indoor mapping, UAS and mobile mapping complement rather than compete with one another. For example, if used indoors a UAS could collide with objects or people, causing damage and possibly injuries, making it useless in crowded indoor environments. In such a setting, mobile mapping is a perfect solution. In addition, the two platforms have different perspectives (i.e. view angles): sideways-looking versus image capture from above.

Building information modelling (BIM) plays an essential role in the circularity mindset, since information on the types and quantities of construction materials used is key. Such an information system, which is also needed for the inspection and maintenance of indoor and outdoor spaces, could be called a building materials cadastre.

Bottlenecks

Ever since the emergence of computers, it seems to have been a rule of thumb that the amount of data acquired by sensors is ten times as much as the processing capacity of computers – so it's no wonder that so many researchers are throwing themselves into data science and artificial intelligence to speed up the processing of geodata. Another major bottleneck preventing the rapid introduction of UASs in several applications is that many professionals seem reluctant to replace tried-and-tested technology with a novelty that has a non-proven outcome – even though it may be convincingly cheaper and demonstrably more efficient.

Essentials

There are four essential ingredients determining data quality (i.e. accuracy and detail) in 3D mapping systems: the sensors, the software, the platform and, above all, the survey plan. The design of the survey plan requires thorough knowledge, skills and expertise. This is where the geomatics specialist comes in. Given the strong societal needs for geoinformation outlined above, it is odd that universities in so few countries offer bachelor-level geomatics degrees; at best, the subject is usually on offer at master's level only. There is a serious risk that society will pay the price for this in the future and be forced to increasingly depend on the less specialized knowledge of the multinational informatics industry.

Source: <https://www.gim-international.com/content/article/uas-mapping-where-is-it-heading-2> (accessed 04-07-2021)