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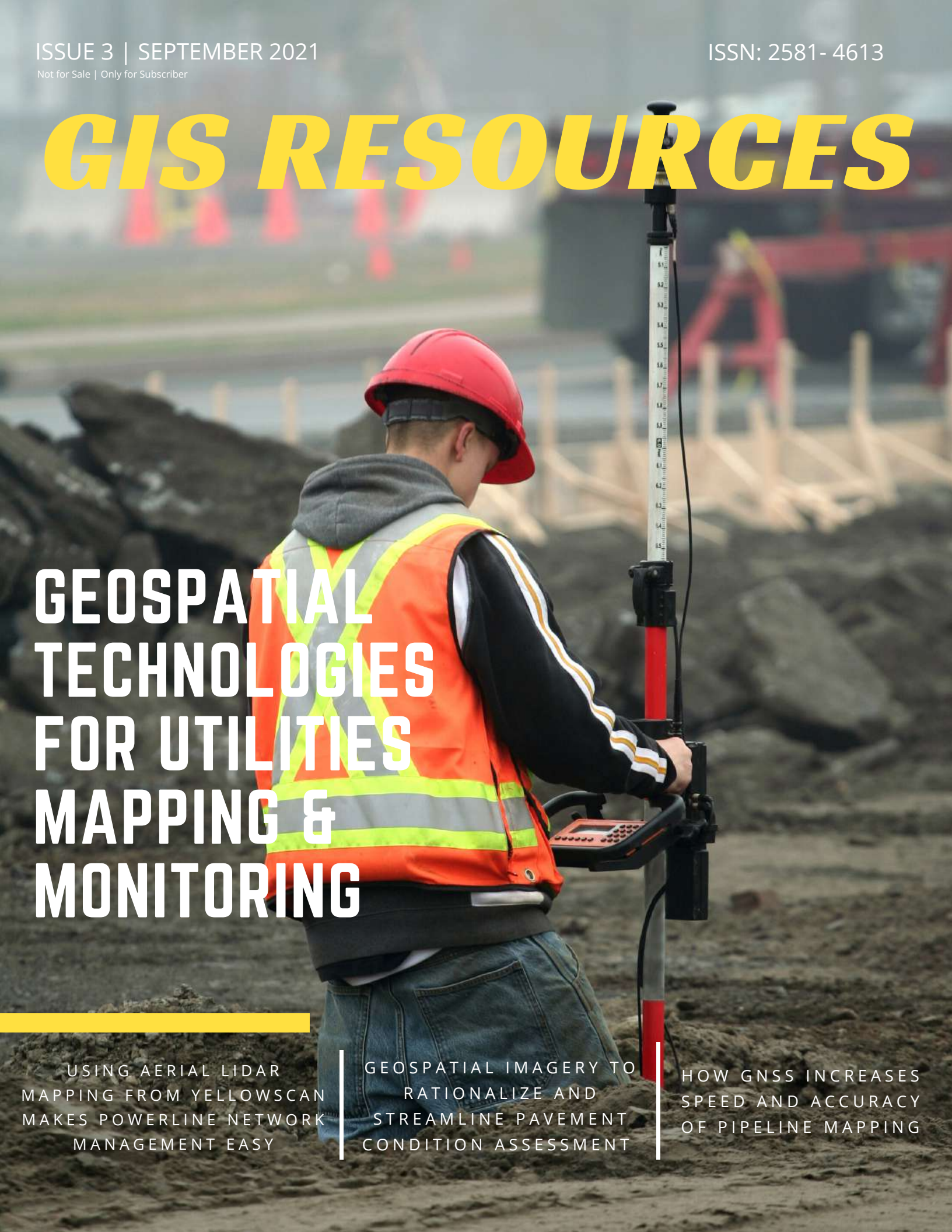
GIS RESOURCES



GEOSPATIAL TECHNOLOGIES FOR UTILITIES MAPPING & MONITORING

USING AERIAL LIDAR MAPPING FROM YELLOWSCAN MAKES POWERLINE NETWORK MANAGEMENT EASY

GEOSPATIAL IMAGERY TO RATIONALIZE AND STREAMLINE PAVEMENT CONDITION ASSESSMENT

HOW GNSS INCREASES SPEED AND ACCURACY OF PIPELINE MAPPING

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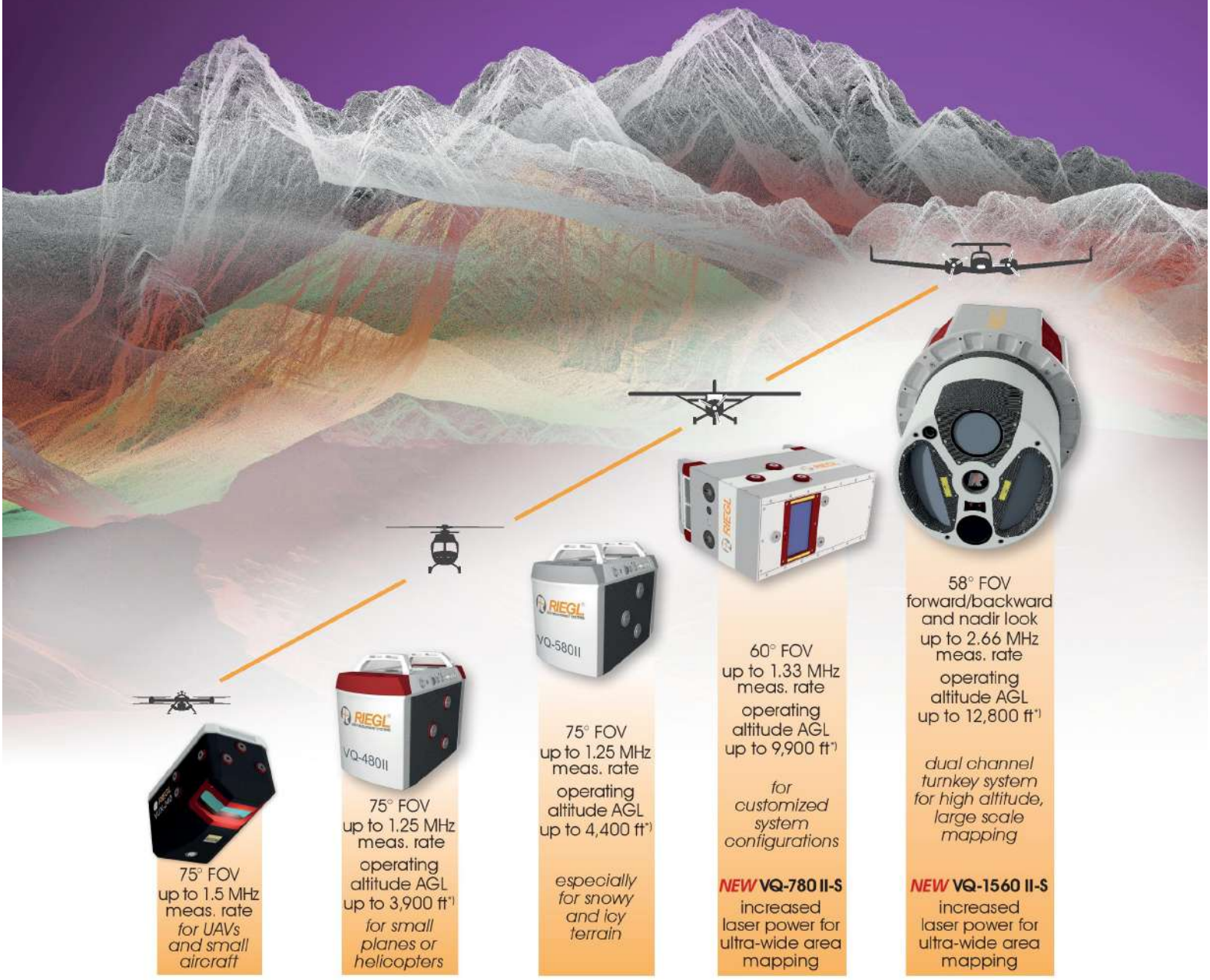

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editor's note

Digital Data is now a part of our everyday life. Mobile & Drone technology has enabled the explosion of digital data generation. Among other things that we now take for granted, is to ask Google where such and such place is located and how do we get there. The data is available in the digital domain and the technology is enabling the outputs.

Governments create, maintain, and provide utilities for the well-being of its citizens. Each sector will have its own set of utilities. For example, the Agriculture and Manufacturing sectors will have their own unique set of utilities. Some utilities, however, are vital to all sectors and segments of life and livelihood.

Electricity, Transportation, Water, Communication, Drainage, Sewerage, Housing are some utilities that have now become essential for human existence, growth, and livelihood. Traditionally data about these utilities existed on analog maps generated by arduous survey methodologies. With the advent of digital technology, and in this context Geospatial Technology, the world has the ability to create, maintain and disseminate data and information pertaining to Sector-specific and encompassing utilities.

We have transitioned from Analogue to Digital with the use of modern Geospatial Technologies. Hand-held mobile Geospatial Technologies, as well as Drone technologies, create digital data which can be processed using powerful Geospatial Technology Hardware and Software to create Information based maps for mapping and decision making. Along with the myriad Geospatial Technologies, Hardware and Software we now have the ability not only to map, maintain and monitor utilities but also to decide the most optimum use and expansion of these utilities.

As mentioned in an earlier issue, the Smart city concept of the Government of India is all about setting up as well as upgrading utilities for the citizens. Mapping and monitoring the utilities using Geospatial Technology will not only preserve the data but also help in future up-gradation and expansion of these utilities. With the drive towards creating green energy infrastructure, the ability of Geospatial Technology, Digital data and Geographical Information Systems needs to be exploited to decide where and how the infrastructure can be best set up, mapped, and monitored.

Utilities can now be continually mapped, managed, and monitored and their information disseminated using the whole gamut of Geospatial Technologies.

Ashok Prim
Editor

GEOSPATIAL IMAGERY TO RATIONALIZE AND STREAMLINE PAVEMENT CONDITION ASSESSMENT

When drone and machine learning hit the road.

Extensive amount of irregular pattern cracks and some block cracks.

> Machine learning supports the categorization of cracks and other defaults at large scale. However, it can definitely support more within the establishment of the maintenance plan and costing.

Our roads are essential for transportation of goods and persons. The amount there are many construction projects underway or already completed within the vicinity of underground sections of the English city's rapid transit system. These projects often require careful monitoring of sections of the rail network.

Road Management System and Assessment

The assessment of a road's status, the need for repairs and the potential cost associated with it have been for decades the work of experts walking miles along roads. This tedious assessment based on experience, training and a sharp eye results in the categorization and rating of the road conditions. The Pavement Surface Evaluation and Rating (PASER) guide or the Pavement Condition Index (e.g. based on ASTM D5340 or DS6433 standards) are examples of such condition ratings. From roads in excellent conditions down to the roads where alligator cracks and potholes have taken over. Based on the rating of road segments, the cost estimates and

About Author

Dr Frank de Morsier

Co-founder and CTO
Picterra
Switzerland

prioritization of work can be done and lead to a tender process for maintenance. More complex road assessment methods have been developed with vehicles combining multiple cameras, laser scanning and sometimes ground penetrating radar. They provide a complete picture of the road condition and underneath structure, however performing such assessment at large scale is not cost effective. They are to be used on focused road sections which have been flagged as requiring extensive characterisation.

Bringing Experts into Safer Conditions

The expert assessment walking down the road, performing measurements of crack width, rutting depth and other surface characteristics is far from being safe and efficient. The accidents and risk exposure of such work makes insurance premiums go up and life's of experts at risk. The solution lies in the possibility to remotely sense the data from the distance and perform the expert assessment back in the office.

Drones at the Rescue

The drones that have ramped up now as a mature technology are unlocking this split between the collection of raw data and the rating of the road condition based on that data. Drones are providing a unique way to quickly collect raw data that removes ambiguities and subjectivity from the process. The consumer drones as well as professional ones are equipped with camera sensors allowing them to provide image at sub-centimeter pixel resolution. The improvements on the photogrammetry side of the technology enabled also the 3D reconstruction and true orthorectification of image mosaics. This enables the experts to characterize road segments straight from their desktop and to derive precise measures from the image such as surfaces of asphalt, proportions covered with alligator cracks, crack width, potholes diameters, etc.

Machine Learning Scaling the Expertise

However, the real gain is happening the moment the raw data can be turned into information about the pavement conditions in a less tedious way and at a larger scale than before. This is exactly what Machine Learning is all about: generalizing from high quality human expertise on large amounts of data. We have seen machine learning for the extraction of information from geospatial imagery going under a transformative shift in the last few years. We had the chance to be part of that journey too with the Picterra platform putting machine learning in the hands of GIS for fast extraction from satellite and drone imagery.

The deep learning revolution made the shift between crafting algorithms for specific applications to gathering the right training dataset to train a neural network. This brought the massive advantage of being able to consider the extraction of many different information simply by providing relevant examples to train a model and not having to care about defining the algorithm itself.

In the assessment of asphalt conditions, models can be trained on the extraction of cracks of different types (alligator, fatigue, block cracking, longitudinal cracks), but also sealed cracks presenting a different aspect, and higher level structures such as potholes, erosion. The extraction of the information allowing a complete assessment of the road conditions starts with the segmentation of the different materials and structures (asphalt, sidewalk, slabs, curb, gutter). Then the defects are mapped enabling the possibility to deduce surface ratios (crack surface percentage per slab or road segment) and measurements (length, width) producing an objectivized rating of the asphalt condition.

The models are trained to detect the different categories of cracks at once, therefore developing discriminative features enabling this fine-grained categorization. The accuracies for cracks and sealed crack are extremely high (>95% f1-score). For the categories involving the structure and density such

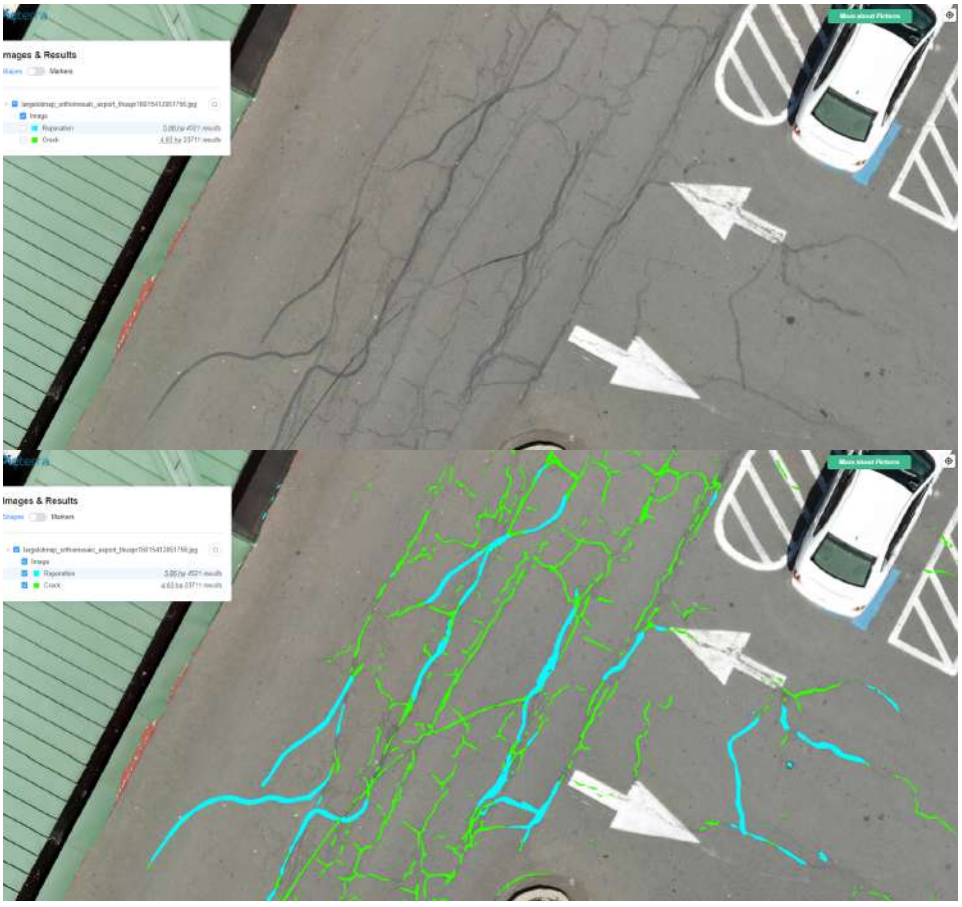

Figure 1: Multiple longitudinal cracks creating an irregular pattern. There is a partial presence of sealed cracks.

as alligator cracks and block cracking, the comparison with rather subjective definitions makes it more difficult to get to a relevant accuracy number.

Pavement Condition Rationalized and Rehabilitation Effectiveness

The pavement condition analysis is most of the time incomplete due to the inability of the expert to walk over each part of the asphalt and report all defect characteristics. Moving into imagery-based and machine-learning methods brings the capacity to get a complete and rationalized assessment of the conditions. In the Figure 1. A small portion of a parking lot is shown with two different types of cracks present. The trained model distinguishes between the fatigue cracks and the sealed cracks from previous maintenance intervention. This provides a solid base for directly deriving the asphalt condition rating, and to investigate the effectiveness of the previous repairs.

The analysis of a large asphalt surface such as a parking lot provides a completely new perspective beyond the pure pavement condition assessment. The relationship between the condition and the past rehabilitation works are directly standing out. In Figure 2, less sealed cracks are present and an important amount of cracks and block cracking is detected.

An example is presented in the Figure 1 to 4. The sealed cracks are directly impacting the density of cracks in their neighborhood, delaying the decay of the asphalt condition. The effectiveness of any maintenance program can be easily monitored this way on top of providing a complete picture of the pavement conditions and maintenance work required. Figures 3 and 4 are showing the impact of the sealed cracks on the delayed degradation of the asphalt pavement conditions.

From Cracks to the Maintenance Plan

Machine learning supports the categorization of cracks and other defaults at large scale. However, it can definitely support more within the

Figure 2: Extensive amount of irregular pattern cracks and some block cracks. There is a mild presence of sealed cracks.

Figure 3: Several longitudinal sealed cracks are there to prevent further degradation.

establishment of the maintenance plan and costing. One significant time-consuming part is the outlying of the reporting units, meaning the individual areas that needs to be categorized. This typically corresponds to concrete slabs in parkings, or road sections of 10m length. The creation of these areas can be supported by Machine Learning providing another time saver in the creation of a maintenance plan. The concrete slab intersections are visible in drone imagery and can be detected to guide the semi-automated creation of such per-slab reporting grid. Figure 5 is showing an example of semi-automated slab extraction. Once the grid is obtained and edited in places where settings are different (round corners, triangular slabs, etc.), the categorization per slab can be done automatically using the detected cracks and other defaults as inputs.

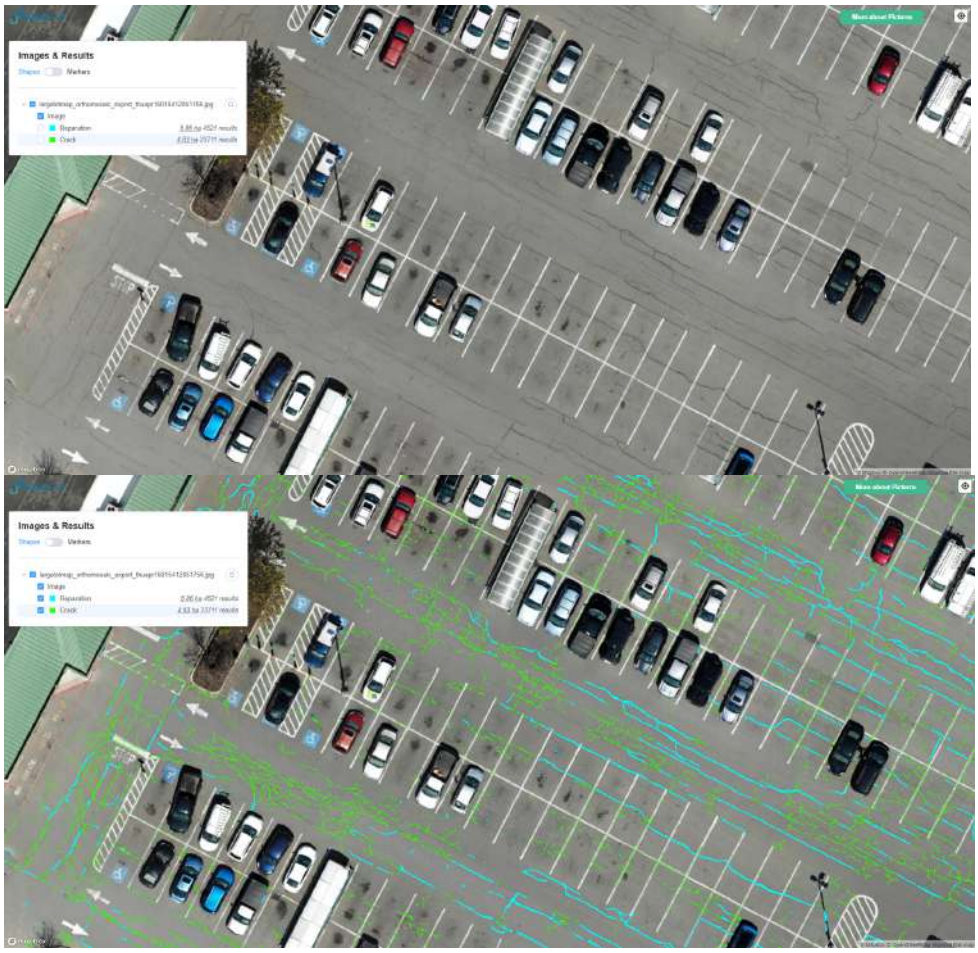

Figure 4: Overview of the parking lot. The maintenance program involving crack sealing clearly benefits towards a longer lifetime of the asphalt pavement. The areas with no sealed cracks show a greater degradation compared to the areas where the sealing was employed.

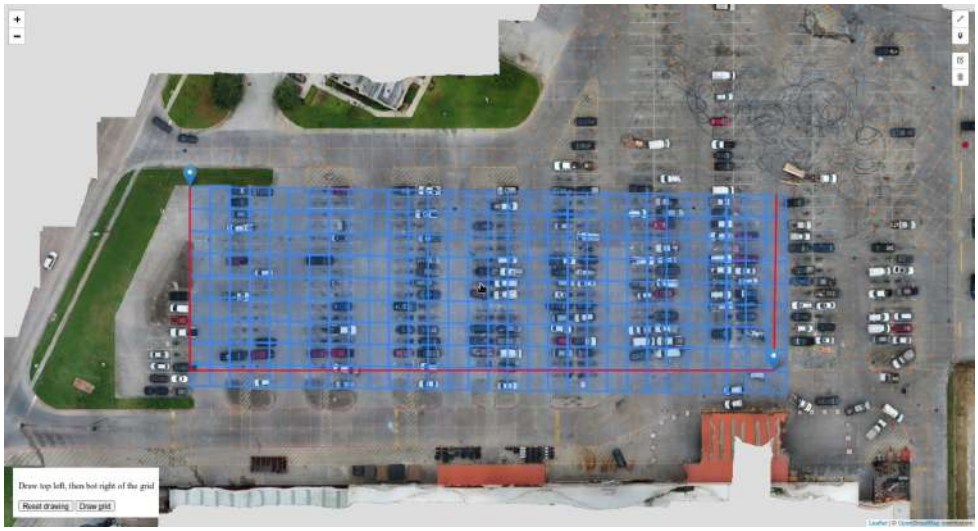

Figure 5: Semi-automated slab extraction. This is an interactive AI-assisted tool that allows users to easily outline the concrete slabs that make up the parking lot. This can then be used for per-slab reporting.

Optimizing the Maintenance Plan

Imagine you are owning thousands of parking lots and need to optimize the maintenance resources allocated. This is exactly where the drone and machine learning based pavement condition assessment will strive. Collecting the data quickly and analyzing it at scale in even less time enables the optimization of the maintenance planning, the monitoring and anticipation of the condition decay and a cost efficient management of the overall structure ensuring a long standing high quality pavement.

Author Bio:

Dr Frank de Morsier received the BSc degree in Electrical Engineering and the MSc degree in Information Technology with a Minor in Space Technologies from the EPFL, Switzerland, ranked as world's 12th and Europe 2nd best engineering university. He holds a PhD in machine learning applied to remote sensing imagery from the EPFL-LTS5 and worked in the private industry in the field of remote sensing image processing since 2014. He is also lecturer of the “Image Processing for Earth Observation” master course at EPFL. He has an extensive practical and theoretical knowledge of machine learning and pattern recognition for image processing. Co-founder and CTO of Picterra, his focus is on the development and applications of machine learning algorithms for multitemporal and multisensors image analysis, with a special emphasis on approaches allowing to upscale processing chains while keeping end-user interactions within the loop.

HOW GNSS INCREASES SPEED AND ACCURACY OF PIPELINE MAPPING

With the Trimble R2 GNSS receiver providing positional accuracy down to centimeter-level, SCE Technicians are confident in the location of data.

Using GNSS, SCE has reduced man-hours by being efficient in the data collection process during pipeline construction.

SCE Technicians constructing a pipeline.

Natural gas utility companies install thousands of miles of pipeline each year and have found keeping a database of their buried assets is a crucial element for renewal, maintenance and locating needs. The data collection of pipeline assets requires speed, accuracy, and the ability to capture locations and information in difficult conditions. The data supports utility operations and asset management and can be shared with other utilities and public agencies when necessary. Utilities can utilize the collected data to find pipe in the field quickly to identify potential problems efficiently.

When new gas pipelines are installed, field engineers record attributions on all pipeline components including the pipe segments, connections, asset type, pressure tolerance and personnel. Details down to individual welds are captured and entered into a GIS database. In many cases, the data must be recorded immediately before a pipeline is buried and information unrecoverable. The process of positioning and asset recording must be easy, fast, accurate and completely reliable.

Suburban Consulting Engineers, Inc., (SCE) has over 30 years of expertise with gas utility companies and is one of the nation's top civil and municipal engineering firms. SCE has built an

About Author

Nicholas Duggan

Fellow of the Royal Geographical Society
A Chartered Geographer (specializing in GIS)
A writer, and an experienced user of Esri software

Enhanced GIS System that uses GIS technologies to support the collection of detailed asset information required by gas utilities and regulatory agencies. To capture the locations, attributes and associated geotagged images, SCE uses Trimble R2 GNSS receivers with TDC600 handheld data collectors running ESRI Collector software. In some areas, SCE accesses correction data via a real-time GNSS network built on Trimble VRS technology.

To meet requirements for traceability, SCE developed high-efficiency techniques to collect live as-built of their client's pipelines. The work has culminated in a method that meets Pipeline and Hazardous Materials Safety Administration (PHMSA) requirements. As part of its process, SCE uses the ESRI GIS platform to provide a consistent geospatial framework to record the detailed information. SCE creates a custom library of forms for each gas utility client for data collection that enables Field Engineers to use standard workflows while capturing asset information.

With the R2 receiver providing positional accuracy down to centimeter-level, SCE Technicians are confident in the location of data. By using the large capacity data storage in the TDC600, they can maintain large GIS databases and store information and images. For each project, the collected data is transitioned to an ESRI geodatabase where Quality Assurance (QA) is performed to test for connectivity between pipeline sections and consistent attribution. The resulting data is fully traceable, verifiable and provides a complete record for the life of the assets in accordance with the PHMSA regulations.

Figure 1: To capture the locations, attributes, and associated geotagged images, SCE uses Trimble R2 GNSS receivers with TDC600 handheld data collectors.

As a result, SCE clients no longer need as many of their own GIS Technicians to model or translate data. Each client can see a full digital twin of their pipeline, updated digitally weekly and customized to be consistent with each clients' existing schema and formats.

One of SCE's client, Jacob McGlincy, GIS Supervisor at Southern Company Gas, recognizes the benefits of using the GNSS receiver with GIS, As he was wrapping up final inspections and commissioning

activities at the end of a new pipeline project, McGlincy was asked to find all of the pipe segments installed on a transmission pipeline project that were manufactured on a specific day, had a specific type of coating, and had a field bend. “It took just five minutes to query our data and identify seven pipe segments from more than 1,100 that had been installed —together with their exact locations in the field.” McGlincy said. The seven segments were verified and the pipeline was successfully commissioned on time. “Without the real-time access to the detailed data, this research could have taken days or weeks with many unsuccessful exploratory digs to find and verify these segments," he said.

Figure 2: To capture the locations, attributes, and associated geotagged images, SCE uses Trimble R2 GNSS receivers with TDC600 handheld data collectors.

Using GNSS, SCE has reduced man-hours by being efficient in the data collection process during pipeline construction, with just one day needed to load the Enhanced GIS data into their clients’ GIS. Previously, this data could not have been captured with the same degree of completeness or precision. According to SCE’s Georgia Office Manager, Marc Sheridan, there is more to come. “This isn’t the end result,” Sheridan said. “We started this data collection system seven years ago and we’re still advancing it. What started as simple pipeline feature collection is now growing and moving to material collection. Inspection reports are going digital and we’re working on inspections and close-out packages to provide complete pipeline documentation.”

Figure 3: TDC600 handheld data collectors running ESRI Collector software (Left). Trimble R2 GNSS receiver (Right).

1 DAY TO 1 HOUR FOR CELL TOWER INSPECTION IN CAMEROON

SkyVue Solutions used drones and PIX4Dinspect to slash the inspection time of a cell phone tower in Douala, Cameroon.

Cell Phone Tower. Images courtesy of SkyVue Solutions

The project was special because it made people safer. By performing tower inspections with drones, can cut completely the need for humans to climb on towers for inspections.

SkyVue Solutions showed the amazing results of inspecting cell towers using a drone with Pix4Dscan and Pix4Dinspect when they trialled the inspection of a cell phone tower for IHS Towers in Douala, Cameroon. The inspection time was hugely reduced and the cost decreased by one third, with the final report enhanced by the improved accuracy. All of this was possible due to using Pix4D software and a drone for the tower inspection.

Based in Cameroon and the USA, SkyVue uses drones to offer technical services to a variety of industries, including telecommunications, construction and insurance. Their aim for the IHS Towers project was to trial an improved inspection process through performing a standard cell tower inspection using drones and generating an intelligent Digital Twin of the tower in 3D. If successful, this trial would mean the tower could be virtually available for IHS Towers teams to measure, plan new installations or explain engineering work.

The Risks of Cell Tower Inspections

IHS Towers have 2,217 communications towers across Cameroon, with the IHS Cameroon team monitoring them. IHS Cameroon need to regularly check their towers to evaluate antenna positions, faults or broken equipment.

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However, telecommunications towers can be 300 meters high. To visually inspect them requires a qualified specialist to climb to the top of the structure, take photos and/or make visual observations which are compiled in a report outlining the state of the cell phone tower.

The problem with this method is that it is very dangerous for the person climbing the tower, who risks serious injury if they fall. It is also time consuming, expensive and can produce low-quality or incomplete data. With the scale of IHS Cameroon's operations, they sometimes rely on hand drawn sketches of towers for antenna additions, engineering or maintenance planning work. This process does evade safety risks for a person who would have to climb, however, it is not particularly fast or any less expensive. But this is the old way.

The Reality of Using Drones for Cell Tower Inspections

Using Pix4Dscan and Pix4Dinspect, SkyVue managed to complete a single inspection without having to send any staff up the tower, nor did they need to rent expensive equipment. Taking 1 hour instead of a whole day for the inspection process, SkyVue took advantage of the pre-planned flight mission custom built for cell phone tower inspection on Pix4Dscan.

Project Details

Location	Douala, Cameroon
Scan Team	SkyVue Solutions & IHS Towers
Software	Pix4Dscan and Pix4Dinspect
Hardware	DJI Phantom 4 Pro V2.0 & iPad
Processing time	2 hours
Length of Inspection	1 hour
Image Resolution	20MP

Previously, SkyVue followed four steps for an inspection: work planning/authorization, image capture, image processing and reporting. Now, with Pix4Dscan, the image capture is automated by the Cell Tower flight plan within the iOS app, cutting the time demands of both work planning and taking high resolution photos. Pix4Dinspect then rewrites how image processing works. Old processing software that SkyVue used required significant manual inputting, which increased the chances of errors within the data. This new workflow for cell tower inspection is more time efficient, requiring only 20 minutes of flight time and means multiple towers can be inspected in a day. Being cloud-based, Pix4Dinspect uses automatic machine learning algorithms to measure antennas to help identify them in combination with using the pictures taken in an underneath orbit, which show the coaxial port entries underneath the antennas. As a result, the processing is faster, automated and more accurate than previous methods, which means drones can bring huge

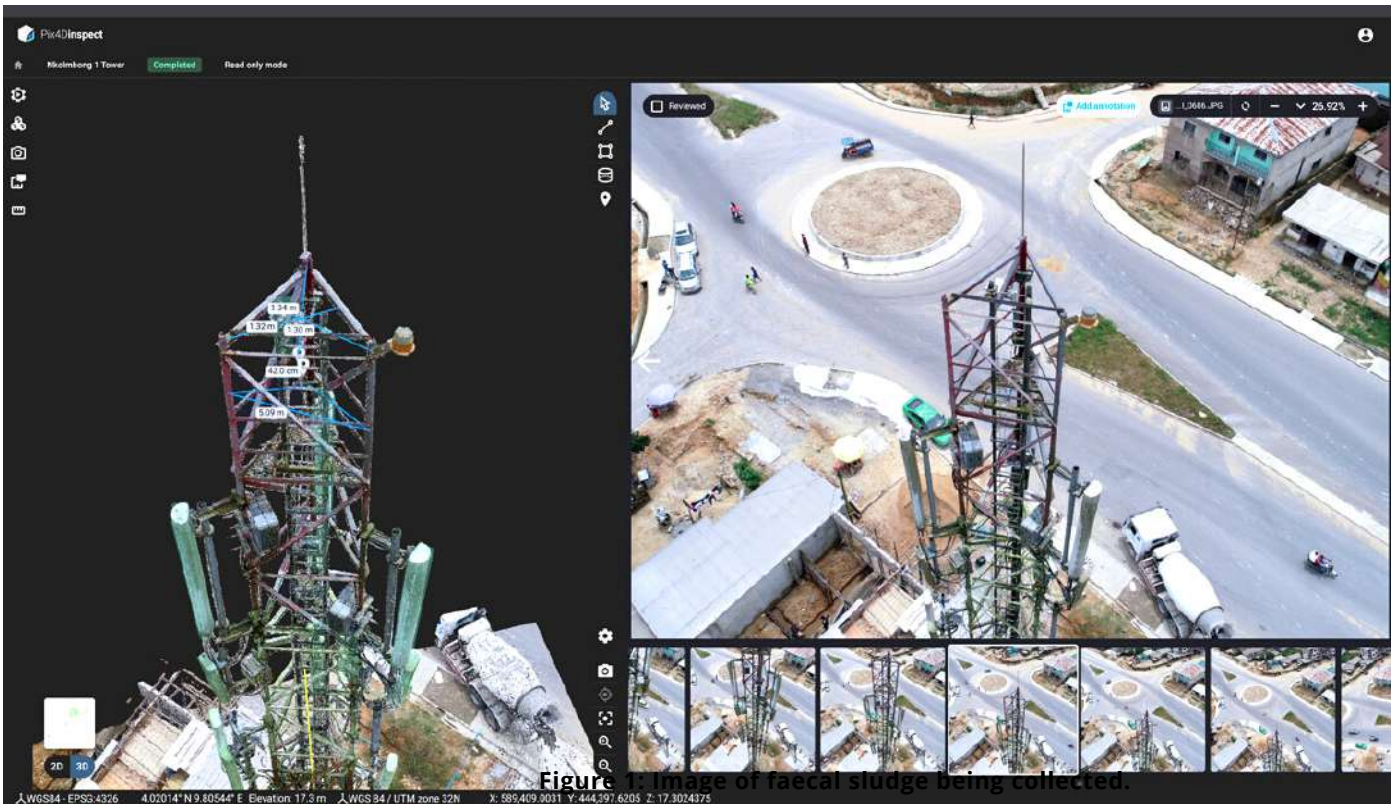

Figure 1: Image of faecal sludge being collected.

Figure 1: Multiple towers in a day: Pix4Dscan only needs 20 minutes flight time/1 battery to collect data for an intelligent digital twin. Images courtesy of SkyVue Solutions.

improvements to the inspection industry. The SkyVue team could then add their own notes to different elements of the tower directly from their browser.

The accurate 3D model of the tower generated was exactly what SkyVue wanted: an intelligent Digital Twin, which automatically displays the height of the antenna and its angles (azimuth, downtilt and plumb). The entire project was seamless - barring a slight delay as a result of the Covid-19 pandemic - and SkyVue published their findings in a detailed PDF report, ideal for easily sharing with IHS Cameroon. For SkyVue, this revolutionized their inspection experience.

Saving Time and Money with Cell Tower Inspection Software

By working with a dedicated software solution for their task, SkyVue Solutions completed their inspection in a fraction of the time and cut costs by a third. The combined capturing and processing of Pix4Dscan and Pix4Dinspect are, in the words of SkyVue Solutions, "a game changer for the inspection world because they are custom designed to address an industry specific pain point."

For the SkyVue team, however, the priority was that they overcame the risk factors which pose a major challenge to inspection of cell towers: "by performing tower inspections with drones, we cut completely the need for humans to climb on towers for inspections and subsequently the risk for human injury and death."

These are the features SkyVue enjoyed and most when working with Pix4Dscan and Pix4Dinspect:

- Auto generated inspection reports simplify identify and tag faults
- Automatic antenna detection and their characteristics assessed for inventory
- Pre-planned Cell Tower flight mission ready in the app
- Helps generate comprehensive inspection reports.

SkyVue weren't the only ones impressed by this perfect trial. IHS Cameroon are now in talks to roll this system out nationwide in a major step for pioneering technological techniques in the country. This is hugely important to Pix4D as it follows the company's aim to democratize 3D drone software, so it can be used around the world where it wasn't possible before.

The full project report is available at SkyVue Solutions Photogrammetry Pix4Dinspect.

Note - Pix4D is organizing USER Conference and inviting Call for Speakers. Visit Pix4D for more information.

PIX4D USER CONFERENCE VIRTUAL

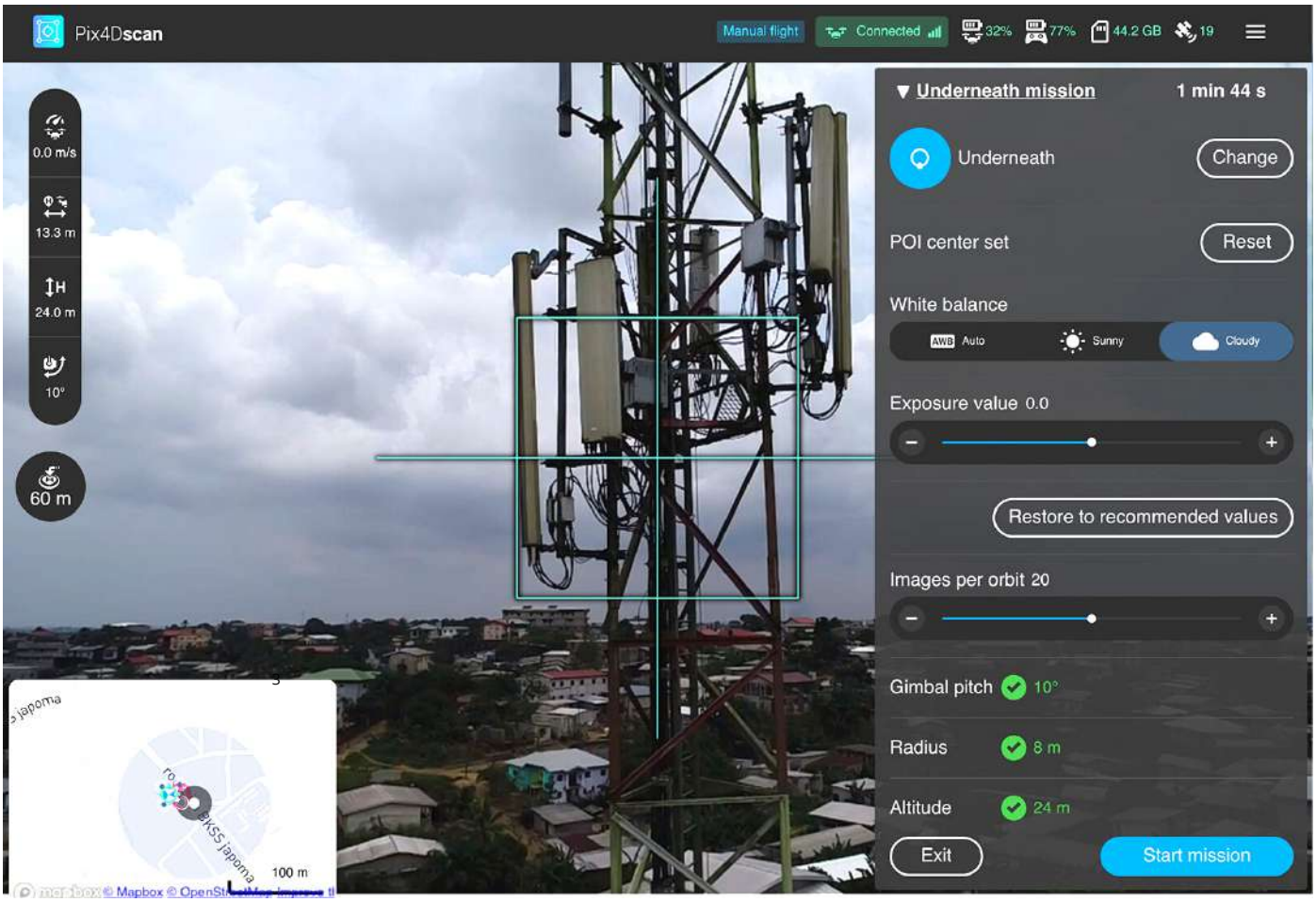

Figure 2: Screenshot of the Pix4Dscan interface with a cell tower in camera. Images courtesy of SkyVue Solutions.

USING AERIAL LIDAR MAPPING FROM YELLOWSCAN MAKES POWERLINE NETWORK MANAGEMENT EASY

UAV LiDAR can drastically increase productivity and safety for powerline monitoring.

YellowScan's LiDAR solutions are high-power laser scanner which can catch points up to 600m away.

Aerial view of Powerline network in forested area. Photo credit: Eltel/Loiste.

Eltel, a Nordic field service provider for power and communication networks, conducted in 2019 a pilot study with Loiste a Finish energy company.

The aim of the project was to investigate **how drone LiDAR can be used for power grid design, maintenance and issue solving**.

Loiste, as an electricity provider, needs efficient and accurate network planning and maintenance. Powerline management can be time-consuming, costly and risky using traditional survey methods. "Inaccurate conventional mapping techniques, particularly in winter with snow coverage, can lead to additional costs and even project delays or stoppages" says Aki Palo, Terrain Planning Manager, Loiste. "The idea with drone mapping is that it can be used to produce an accurate basis for our infranet planning – even during the winter."

Eltel commissioned a pilot study using a YellowScan Surveyor solution that was mounted on Videodrone GeoDrone X4L to prove how each flight can scan a 100m wide area, and produce data rich point cloud maps that can be overlapped to create detailed digital terrain models with an accuracy ranging from 3 to 6 cm. This is really helpful to Eltel for fieldwork planning as drone mapping can streamline the terrain planning processes.

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YellowScan recently announced the launch of its Explorer LiDAR solution. It can be mounted on a light manned aircraft or switched to different types of UAV platforms. This is the first compact, long-range platform of its kind to hit the market and its versatility allows the end-user to tackle a wide range of projects and mission profiles with the proven ease-of-use that YellowScan's LiDAR solutions are known for. Its high-power laser scanner can catch points up to 600m away, yet its low weight (2.3Kg without battery) provides users with the most integrable systems on the market. Combined with YellowScan's full suite of software solutions to easily extract and process point cloud data, we offer our users a highly accurate set of tools to meet the needs of various mission profiles and in particular Powerline management.

"Powerline management is the ideal proof of concept for our Explorer solution. As we proved working with Eltel our traditional Surveyor LiDAR is easily mounted on a UAV and successfully completes the inspection mission. With Explorer you can maintain a high point density while maintaining a high altitude, which implies a maximization of the covered area in one pass. The only limit is the type of aerial vehicle it can be mounted on. For Powerline management, in order to maximize the investment in the tools, the ability for a single unit to be mounted on light manned aircraft for long corridor mapping or the same solution on smaller UAVs for shorter missions is a game changer," stated Nassim Doukkali, R & D Project Manager, YellowScan.

Read more about how UAV LiDAR can drastically increase productivity and safety for powerline monitoring while reducing carbon footprint for infranet planning: "Eltel pioneers the future of infranet mapping in Finland".

Find more information on our complete range of hardware, software and support services at www.yellowscan-lidar.com

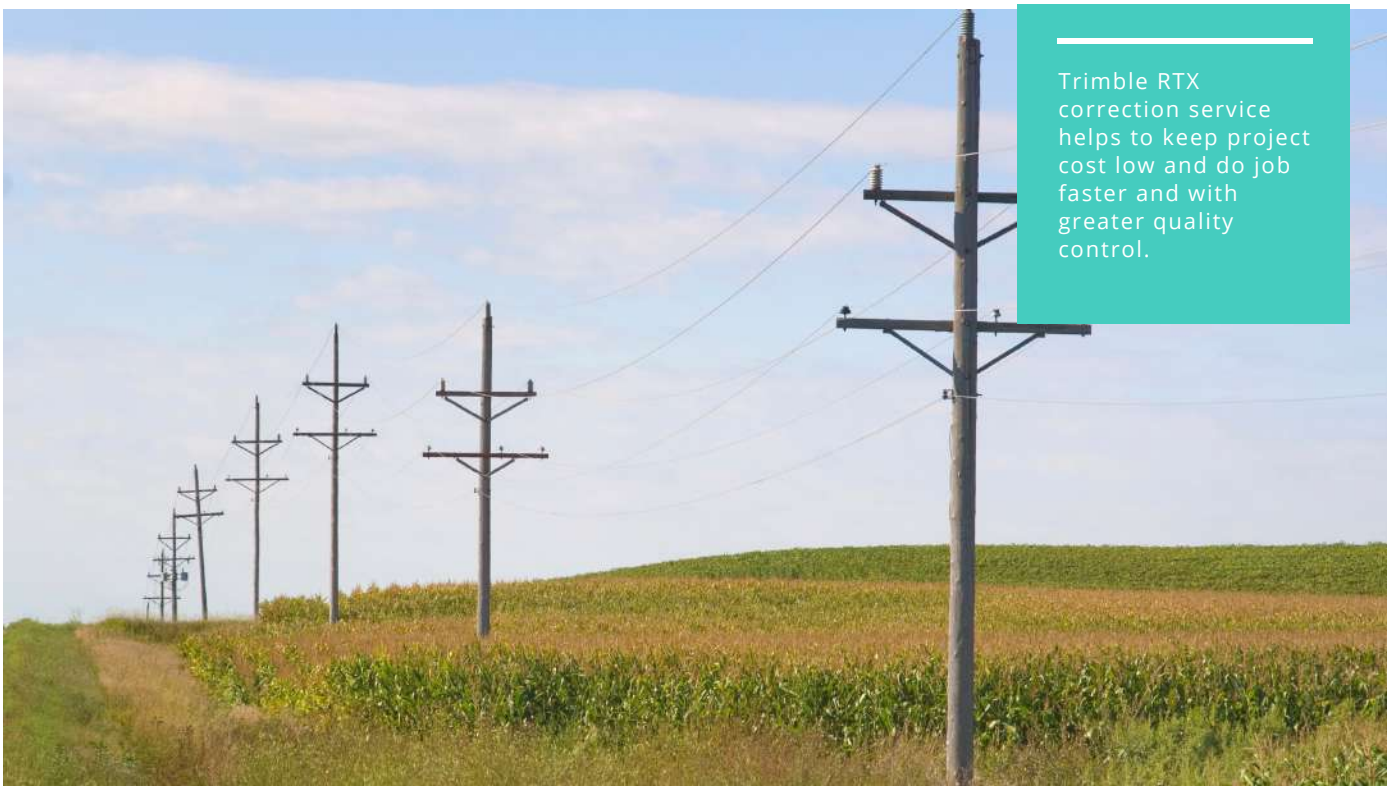
Figure 1: LiDAR Drone Mapping for Powerlines – Eltel and Loiste with YellowScan Surveyor on Videodrone Geodrone X4L. Photo credit: Eltel/Loiste.

Figure 2: LiDAR Drone Mapping for Powerlines in forested area. Photo credit: Eltel/Loiste.

Figure 3: Aerial view of Powerline tower in forested area. Photo credit: Eltel/Loiste.

STAKING A STRAIGHT LINE ON THE OPEN PLAINS

Accurate positioning gives an electric line design and staking company straighter poles and stronger lines.



Trimble RTX correction service helps to keep project cost low and do job faster and with greater quality control.

Mention the American Great Plains and what comes to mind? Wide-open spaces, views that stretch for miles, and lines of electrical poles that seem to run straight into the horizon. But before these poles and wires go up, these lines must first be designed and staked – a process that requires fast, accurate and easy-to-use mapping and positioning in remote locations.

For RMA Engineering LLC, a Kansas-based company specializing in the design and staking of electrical lines for rural electric cooperatives, the goal of every project is the same: straight lines.

"At the end of the job, we want the poles so straight that when you line up and look down the row, all you see is the first pole," says J.P. Metzler, PE, a civil engineer with RMA Engineering.

Having a straight line of poles is about more than aesthetics, however, it's also critical to the structural stability of the entire utility system. "The straighter the poles, the stronger the line will be, which makes the whole system more resistant to strong winds or ice and snow deposits," explains Metzler.

To get that critical straight line of poles, RMA Engineering has started using a correction service from Trimble called CenterPoint RTX.

About Author

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High Stakes

RTX is a GNSS real-time correction service that takes data from a global network of tracking stations and advanced modeling algorithms to generate precise GNSS positioning. These corrections are broadcast to the roving GNSS receiver via a set of geostationary satellites or over the internet, which the receiver uses to produce GNSS positions accurate to less than two centimeters.

It is this use of satellites that makes the system a good match for RMA's work in rural areas because it removes the need to source local corrections or set up a GNSS base station. "We do a lot of work for rural electric cooperatives in the western great plains states," says Jake Schur, Staking Supervisor at RMA Engineering. "When working in wide-open spaces like these, RTX is all we use."

The company is currently working on a FEMA powerline rebuild project in western Oklahoma. The three-year project involves roughly 3,000 miles of staking. Crews are using four GNSS receivers to obtain such things as the horizontal position measurements needed to space the poles correctly and to check elevations so they can choose the right-sized pole.

According to Metzler, using the wrong-sized pole could cause the conductor to pull the pole out of the ground or put enough pressure on the cross arm to cause it to break. "This vertical measurement doesn't require survey-grade elevation," he says. "We just need a relative elevation based off our last pole so we can adjust the location or size of the pole."

By knowing their current positioning accuracy in both the horizontal and vertical components, crews always know they are setting the stakes in the proper location and with the required level of accuracy.

"Knowing the stakes will be within 1 inch of center assures that we can offset a right of way line or monument and that we are in the easement we need to be in," adds Schur.

Figure 1: Electrical lines of rural electric cooperatives.

Streamlined Resolution

Whether working in Oklahoma, Nebraska, Kansas, or Texas, RMA does its preliminary line design using the electric cooperative's software. To physically stake a project in the field, the RMA crew uses Access field software running on a R2 GNSS receiver and a Trimble TSC3 or TSC7 controller.

"RTX and Access (also from Trimble) work really well in the field, the software is very accurate and, because it lets us design on the fly, saves us a lot of time," says Schur. "That's why we routinely work with a co-op's staking department to help them leverage these solutions to offer a better, more streamlined resolution for their staking."

Figure 1: Surveyor from RMA Engineering LLC staking out electric poles using Trimble GNSS receiver.

Once the poles are staked, Access generates a shapefile that is exported back to the cooperative's software, where the preliminary design can be adjusted to match

the actual field-staked project. The file can also be easily shared with property owners, who often have questions about, for example, a pole adjustment.

"We can send the file to them, let them look at it right in Google Earth, and get their blessing before we go ahead with the construction," says Metzler. "This gives us the ability to make sure all stakeholders are happy – it just makes jobs that much easier."

Everything Clicks

Before the advent of GNSS, RMA's staking procedures required up to three crew members: one with a total station, one at the end of the line with a range rod and another walking along the line setting the stakes. With the GNSS system, RMA can now do the job with just one person. "RTX has made things so fast and efficient," says Metzler. "On a good day, when everything is clicking, we can easily stake 12 or even 15 miles a day."

"The amount of time RTX is saving us in the field is simply tremendous," adds Schur. "Although it depends on terrain conditions, I would venture to say we save at least seven man hours per mile compared to using a conventional transit and measuring wheel."

Unlike RTK, CenterPoint RTX doesn't require transporting and setting up a base station – a step that can add significant time and logistical issues to a day's work. Instead, a crew can simply get to the site, turn on their GNSS receiver, initialize – often in just minutes – and go.

"When we're working jobs that require the staking of thousands of miles of line, such as what we're doing in Oklahoma, just imagine the time it would take if we had to lay out RTK base stations," says Metzler. "With RTX, when the contractor says they're ready, our crew needs just a few days to put the stakes in the ground."

As a bonus, when flying to a job site, RMA only needs to transport a single GNSS rover and controller – a factor that helps minimize costs and logistics.

"The system is so intuitive and easy to learn that our crew really enjoys using it," says Schur. "That's why we use it almost daily on the Oklahoma project and will continue to use it for every co-op job we do."

"The bottom line is the Trimble RTX correction service helps us keep our prices low and do our job faster and with greater quality control," adds Metzler. "Most importantly, it ensures that once the poles are planted, we achieve that all-important straight line."

Figure 2: Surveyor from RMA Engineering LLC staking out electric poles using Trimble GNSS receiver.

HELLA INFRATECH - A TEAM OF AVIATION ENTHUSIASTS

A Talk with Vipul Bhati, Shankar Dixit, and Ankush Sengupta

Hella Infratech is a team of highly experienced aviation enthusiasts. The team has immense experience in UAVs, multi-rotor drones and specialty in real-time data feeds to provide the highest quality and accuracy to clients. The primary service verticals are Topographical Survey, GIS Mapping, Asset Inspection, Agricultural Services, Aerial Imagery & Videography, and Surveillances.

Hella Infratech is an ISO 9001:2015 certified company based in Mumbai.

We had a chance to have a small questionnaire with Vipul Bhati, Shankar Dixit, and Ankush Sengupta, the Co-founders of Hella Infratech. The team has shared some interesting insights about the company vision, its success, and thoughts on changing geospatial market trends.

The questionnaire follows as...

GIS Resources - Tell us about Hella Infratech.

Co-founders - Incorporated in 2018, Hella Infratech has built up a reputation as one of the premier Geospatial solution providers in the country. Over the past few years, we have taken its capability to a national level. With a team of 50+ employees spread across different locations, Hella is in a position to deliver various turnkey solutions to clients.

Hella puts data to work to enable autonomous, connected ecosystems that boost efficiency, productivity, and quality for our customers.

GIS Resources - What are the different Drone Survey solutions offered by Hella Infratech?

Co-founders - Our UAVs and Multi-rotor Drones expertise enable us to provide the highest quality and accuracy data better than currently used satellite images. We specialize in Autonomous Data Acquisition, Accurate Survey techniques, GIS solutions, Photogrammetry Mapping Services, Asset Inspections. We are able to provide this with our strong fleet of fixed-wing and multirotor drones with various payload capabilities. We also have a fleet of agricultural spraying drones being used for curbing various insects and hence disease spread by spraying insecticides.

GIS Resources - Tell us about various sectors and clients of Hella Infratech.

Co-founders - A wide variety of organizations have relied on our services, including Town planning departments, the Ministry of Agriculture, Municipal Corporations, Engineering and utility companies. Our solutions enable our customers to holistically understand change and make clear reliable decisions.

Vipul Bhati

Co-founder

Shankar Dixit

Co-founder

Ankush Sengupta

Co-founder

GIS Resources - With new regulations by the Government of India related to Drones/UAVs, what's your take on ease of doing business with Drone/UAV-related business?

Co-founders - The New Rules are no doubt a giant leap forward for the drone sector in India, and the drone landscape has been altered considerably as a consequence. The newly regulated market will usher in bigger clients more investment and overall create a conducive environment for businesses to run. The further additions to the current rules regarding various other categories of drone usage such as BVLOS operations will further keep pushing the envelope of possibilities and opportunities.

GIS Resources - There is a lot of talk going around about The Draft National Geospatial Policy 2021 and liberalization of Geospatial policy, what does this entail to Hella Infratech?

Co-founders - The policy is extremely visionary and aims to increase the exchange and sharing of geospatial data among various government organizations and also making it available for the public. This will usher in more demand and help the industry grow. This will also standardize and optimize data outputs across the country. The idea of having a national accreditation for geospatial surveyors and experts is another important step towards the growth of this industry. We are very optimistic about the new policies and are happy that they align with Hella Infratech's vision for the future.

GIS Resources - How would you describe the current market circumstances (COVID pandemic) for growth purposes?

Co-founders - Current market circumstances have adversely affected our industry just as it has affected the various other sectors of the county's economy. However, the structured methodologies and systems already in place at Hella Infratech helped mitigate the blow considerably, from the loss of efficiency from the "work from home" situation of the pandemic. The industry is all set to bounce back and I believe will become even larger than the pre-pandemic era.

GIS Resources - What are major trends that you think could influence to drive the Geospatial market most in the coming years?

Co-founders - The infrastructure sector has become the biggest focus area for the Government of India. India plans to spend US$ 1.4 trillion on infrastructure during 2019-23 to have a sustainable development of the country. Hella Infratech believes that the introduction of GIS solutions in the infrastructure segment will be revolutionary. The advancement in Lidar, Photogrammetry, and other survey techniques will empower the advancement of the future of Building Information Modelling solutions (BIM).

BUSINESS

June 16 - September 15, 2021

New Lemur Release Extends Enterprise Mobile GIS Capabilities

Critigen has announced the latest release of Lemur, its mobile GIS solution. Lemur delivers enterprise mapping capabilities that complement field service apps used in utilities, oil and gas, transportation, local and federal government, and other large organizations. The latest release provides expanded support for the enterprise, with enhancements to data synchronization, security, and more.

MapMyIndia Filed DRHP with SEBI for an IPO of Around $175 Million

As reported by the Money Control website, an Indian technology company that builds digital map data has filed its draft red herring prospectus (DRHP) documents with SEBI on August 31, 2021. According to DRHP, the initial public offering (IPO) will see an offer-for-sale up to 7,547,959 equity shares by selling shareholders. Mapmy India is backed by the likes of Qualcomm, PhonePe, and Japanese map maker Zenrin. The selling shareholders include Rashmi Verma, and investors Qualcomm and Japanese map maker Zenrin. However, the company did not disclose the details of the IPO.

Bentley Systems Announces Seequent's Acquisition of Imago

Bentley Systems, Incorporated, the infrastructure engineering software company, has announced that its Seequent business unit has acquired Imago Inc, a developer of cloud-based software for the capture and management of geoscientific imagery. The acquisition will expand Seequent's technology solutions portfolio while boosting cloud capabilities to help geoscientists and engineers solve earth, environment, and energy challenges. Imago's cloud-based platform enables the capture, cataloguing, and review of drilling core and chip images from any source, to support every aspect of the geological process from exploration to grade control.

NV5 Geospatial Expands Mobile Mapping Fleet with State-of-the-Art RIEGL VMX-2HA Platform

RIEGL has announced that NV5 Geospatial, North America's largest geospatial data firm, has acquired the new RIEGL VMX-2HA dual scanner mobile mapping system. The solution will initially deploy in utility and transportation projects and enable NV5 Geospatial to collect highly accurate, feature-rich data at highway speeds. The flexibility, ease of setup, and smaller footprint will also allow the use of the VMX-2HA on various platforms, including boats, all-terrain vehicles, and trains.

Space Flight Laboratory (SFL) Awarded Norwegian Space Agency Contract to Build NorSat-4 Maritime Tracking Microsatellite

The Norwegian Space Agency (NOSA) has awarded a contract to Space Flight Laboratory (SFL) to build the NorSat-4 maritime tracking microsatellite. NorSat-4 will be the eighth satellite developed by SFL for Norway, including NorSat-3 launched in April 2021 and the NorSat Technology Demonstrator (NorSat-TD) now under construction. Similar to NorSat-1, -2 and -3, NorSat-4 will be built on SFL's DEFIANT microsatellite platform (a variant of the NEMO platform that uses a separation system and not a dispenser) and carry an Automatic Identification System (AIS) ship tracking receiver developed by Kongsberg Seatex.

NAVAID Calibration Drone by Cursir Helped to Speed Up the Flight Check of the Landing System of the Ulyanovsk Airport

Last year, by order of the Federal Air Transport Agency of Russia, a working group was created on the implementation of UAVs to calibrate, check and configure navigation aids at Russian airports. As part of the activities of this working group, Cursir implemented NAVAID Calibration Drone at the Ulyanovsk-Vostochny airport. NAVAID Calibration Drone is a mobile radio measuring complex developed by Cursir (subsidiary company, R&D department of RTS Union).

Pix4D Announces Entering Into An Exclusive Reseller Partnership With Beijing Skymap Technology Co., Ltd. For Mainland China

Pix4D, the photogrammetry industry leader, has announced the signing of an exclusive reseller partnership with Beijing Skymap Technology Co., Ltd. a high-tech enterprise integrating software sales, service, research and development, and project integration in mainland China.

UP42 Teams with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH to Support Agricultural Start-Ups in Africa

UP42 has teamed with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH to promote technical entrepreneurship in Africa's agricultural sector by making geospatial technology available to local farming-related start-up businesses under the GIZ Make-IT in Africa project. Smallholder farms across Africa lack the Information Technology (IT) infrastructure that can deliver digital agricultural services related to weather forecasts, cultivation techniques, and market conditions. Through this program, UP42 is providing technical consulting along with access to its developer platform for Earth observation data and analytics.

Euclideon Plans World's Largest Geospatial Data Platform on Microsoft Azure, Accelerates Innovation Opportunity

Leading 3D data specialist Euclideon has signed a strategic partnership with Microsoft and unveiled plans to build the world's largest geospatial data platform – featuring more than 100 petabytes of 3D data – on the Azure cloud. Euclideon will launch its visualisation as a service (VaaS) platform, leveraging its high speed udStream 3D render technology which is able to visualise petabytes of data within a second, which will be hosted on Microsoft Azure. This ensures a high performance, resilient platform allowing enterprises across multiple sectors to leverage 3D data in order to optimise business processes.

IIIT Hyderabad Develops New Low-cost Location Tool to Track Assets

IIIT Hyderabad researchers have developed a new localization technique that doesn't use GPS rather uses the Long Range Wide Area Network (LoRaWAN) technology which will provide the location data of the asset. LoRaWAN conveys sensor information using very low-power end devices to all gateways (i.e., base stations) in their transmission vicinity through Long Range (LoRa) wireless communications. The key advantages of LoRaWAN over traditional approaches such as Wi-Fi and GSM-based methods are high resilience to multi-path fading over long distances, and the ability to choose power consumption to be low or high, in line with the specific use cases. The new technology has been presented in a paper titled 'Feasibility of Standalone TDoA-based Localisation Using LoRaWAN' that was published at the International Conference on Localisation and GNSS (ICL-GNSS).

India Plans for Airborne LiDAR Survey of Andaman and Nicobar Islands

Speaking in Lok Sabha, Jitendra Singh Minister of State (independent charge) for Science and Technology and Earth Sciences Ministry said that the Government of India is planning to conduct an airborne radar survey to map the surface topography of Andaman & Nicobar Islands. The mapping will be done by Indian National Centre for Ocean Information Services (INCOIS) and National Remote Sensing Centre (NRSC) using Airborne LiDAR Terrain Mapping (ALTM). This mapping of the strategic archipelago is proposed to carry out mapping of surface topography on the land side of the coast.

CORS Network to Complete Digital Land Resurvey in Kerala

Kerala State Government has given a nod to extended Digital Land Resurvey for 1,550 villages at cost of ₹807.98-crore. The project is expected to complete the resurvey of land over four years in four phases. The project aims to do away with conventional methods of land surveying and to adopt new technologies. The new technologies are aimed at unifying land-related documentation under the departments of revenue, survey, and registration.

Indian Satellite Navigation Policy (SATNAV Policy) – 2021 to Achieve Self-Reliance in Satellite-Based Navigation and Augmentation Services

Department of Space being the administrative Ministry/Department in respect of space activities in India has released a draft of "Indian Satellite Navigation Policy (SATNAV Policy) -2021." The policy has been formulated towards effective development, operation, and maintenance of satellite-based navigation systems. The policy statement read Department of Space shall work towards expanding the coverage from regional to global to ensure availability of NavIC standalone signal in any part of the world without relying on other GNSS and aid in wide utilization of Indian navigation system across the globe. The Department of Space shall put continuous efforts towards ensuring the Indian navigation and augmentation signals are interoperable with other free-to-air navigation.

Mobile App to Boost the Cardamom Growth and Help Farmers with Site-specific Recommendations

According to recent news by The Hindu, the Spices Board and Rubber Board, India has signed a memorandum of understanding (MoU) with the Digital University of Kerala. The MoU was signed at the Rubber Research Institute in Kottayam to generate spatial models of soil nutrients in cardamom tracts and develop an Android-based mobile application for cardamom growers to follow site-specific and need-based fertilizer recommendations.

BRICS Space Agencies Signed Agreement for Cooperation in Remote Sensing Satellite Data Sharing

Under India's BRICS Chairship, the BRICS Space Agencies Heads have signed an agreement for cooperation in remote sensing satellite data sharing on August 18, 2021, in the presence of Mr. Sanjay Bhattacharyya, Secretary (CPV&OIA) & India's BRICS Sherpa, Ministry of External Affairs, Government of India and other officials from respective external/foreign affairs Ministries.

GIS-based System for Optimal Site Selection of Sewage Treatment Plants

Kerala Water Authority (KWA) has come-up with a new tool using Geographical Information System (GIS) for optimal site selection of Sewage Treatment Plants (STP). A GIS is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.
A conventional method of site selection of Sewage Treatment Plant in the planning stage involves collection of topographical, environmental, economic & socio-political data and its analysis, which is time consuming, laborious, and expensive.

Three HawkEye 360 Formation-Flying Microsatellites Built by Space Flight Laboratory (SFL) Successfully Launched

HawkEye 360 Inc. has announced the successful launch of its Cluster 3 radio frequency geolocation microsatellites built by Space Flight Laboratory (SFL). Carried aboard the June 30 SpaceX Transporter 2 mission, the Cluster 3 formation-flying microsatellites join in orbit the HawkEye 360 Cluster 2 and Cluster 1 Pathfinder satellites – all built by SFL. The HawkEye 360 launch brings to 20 the total number of SFL satellites placed into orbit in less than a year.

Bentley Systems Announces Seequent's Acquisition of Aarhus GeoSoftware

Bentley Systems, Incorporated has acquired Danish company Aarhus GeoSoftware, a developer of geophysical software. The acquisition extends Seequent's solutions for operational ground water management, and for sustainability projects involving exploration, contaminants, and infrastructure resilience.

Trimble X7 and Perspective 3D Scanning Solution Garners Three International Design Awards

Trimble has announced that the Trimble® X7 and Perspective 3D Scanning Solution has received three international design awards. Ideal for surveying, construction, industrial and forensics applications, the Trimble X7 Scanning Solution has received the following recognition: iF Design Award 2021, Red Dot Design Award 2021 and New York Design Award 2020.

PRODUCT LAUNCH

June16, 2021 - September 15, 2021

China Launches Hyperspectral Remote Sensing Satellite – Gaofen-5 02

China successfully launched the Gaofen-5 02 into space from the Taiyuan Satellite Launch Center in northern Shanxi Province on September 07, 2021. The satellite was launched using the Long March-4C carrier rocket. It was the 387th flight mission of the Long March carrier rocket series. Gaofen-5 02 is a hyperspectral satellite that will be used for comprehensive environmental, atmosphere, water, and land monitoring.

Trimble Boosts Flagship RTX Correction Services Performance

Trimble has announced enhancements to its industry-leading Trimble RTX® correction services, tailored to meet the evolving needs of geospatial professionals. As part of an ongoing strategy to deliver premier high-accuracy correction services to users worldwide, Trimble has delivered convergence time reductions, more reliable and robust signals, and an easier workflow for surveyors. These enhancements further enable geospatial professionals to untether from the cost and complexities of Global Navigation Satellite System (GNSS) base stations and complete fieldwork faster.

RedTail LiDAR Systems Unveils Innovative LiDAR System for Small Drones

RedTail LiDAR Systems, a leader in microelectromechanical systems (MEMS) mirror-based LiDAR technology, has unveiled the market introduction of the RTL-450 LiDAR sensor. The RTL-450 incorporates a lightweight MEMS mirror and a precision navigation system to generate accurate data for the most demanding of aerial surveying missions. The high-resolution, three-dimensional point clouds created by the RTL-450 provide operators an unsurpassed ability to conduct advanced analytics of geographic and manmade features on the earth's surface. The RTL-450 – which is designed and assembled in the U.S. – incorporates patented LiDAR sensor to achieve superior performance.

Hexagon Announces Luciad 2021

Hexagon's Safety, Infrastructure & Geospatial division announced the release of Luciad 2021, a significant update to its platform for building advanced location intelligence and real-time, situational awareness applications. Luciad 2021 delivers enhanced performance, improved development capabilities and more dynamic web applications. With Luciad 2021, defense, aviation, maritime and other organizations can develop more effective and reliable web applications.

IDS GeoRadar Launches Stream T

The ground-penetrating radar system (GPR) Stream T measures tunnel anomalies such as lining thickness, reinforced structures, cavities and wet areas. Stream T's modular structure allows this innovative GPR array to overcome obstacles and increase productivity five fold compared to traditional systems, collecting data at up to 60 km/h (37.3 mph). The operation of Stream T from inside a vehicle increases safety of technicians at the tunnel site. Stream T's contactless antenna solution can work up to 20 centimetres from the tunnel surface, reaching a faster acquisition speed and therefore easier data collection in this difficult environment and increasing data quality as a result.

Trimble GEDO GX50 Laser Scanning System Introduced for Clearance Analysis and Asset Data Collection for Railway Applications

Trimble has introduced the Trimble® GEDO GX50, a flexible laser scanning system designed to operate with Trimble GEDO track measurement systems for clearance analysis and asset data collection, further enhancing the modular track survey and scanning solutions portfolio. The Trimble GEDO GX50 features new Trimble-designed profiling lasers for high-accuracy data collection. It is available in a Single Head configuration with one laser scanner and a Dual Head configuration with two laser scanners, and the scan heads can be flexibly adjusted depending on project requirements. The modular design allows the second laser scanner to be added when higher point density is required or faster trolley movement is desired.

Trimble MX50 LiDAR System Expands Mobile Mapping Portfolio

Trimble has introduced the Trimble® MX50 mobile mapping system for asset management and mapping - a new addition to its established mobile mapping portfolio. This vehicle-mounted mobile LiDAR system is a mid-range option for first-time mobile mapping users and experienced providers to expand their equipment fleet with precise, high-volume data capture technology that works in conjunction with Trimble's geospatial software solutions. The Trimble MX50 features new Trimble-designed profiling lasers for high-accuracy data collection, a 360-degree panoramic camera and a GNSS/IMU positioning system from Applanix, a Trimble Company. The system produces dense point clouds and immersive imagery for surveying and mapping accuracy, and works with Applanix POSPac, Trimble Business Center and the Trimble MX software suite.

Hexagon Launched the Leica BLK ARC and Leica BLK2FLY

Hexagon AB has announced the launch of the Leica BLK ARC and the Leica BLK2FLY. The Leica BLK ARC is a laser scanning sensor purposely built to improve the autonomous navigation of robots and other carrier platforms to deliver fully autonomous mobile laser scanning. Combining its speed, accuracy, and versatility with robotics, the BLK ARC addresses the growing demand for autonomous solutions that can safely and repeatedly capture accurate 3D point clouds and panoramic images of changing environments with minimal user intervention. The Leica BLK2FLY is the world's first fully integrated, autonomous flying laser scanning sensor. With a few simple taps on a tablet, users can quickly and easily scan structures and environments accurately and entirely from the air. The BLK ARC and BLK2FLY connect directly to Hexagon's cloud-based visualisation platform, HxDR, where immediate data upload from the field, AI-enabled cloud processing and storage of the captured data enables instant delivery of a purpose-built smart digital reality to anyone who needs it.

Yuktdhara – New Geospatial Planning Portal for MGNREGA

The Minister of Rural Development and Panchayati Raj Giriraj Singh has launched "Yuktdhara" a new geospatial planning portal to facilitate MGNREGA assets mapping using remote sensing and geographic information system (GIS) based system. Yuktdhara is a geospatial planning portal meant for facilitating Gram Panchayat level planning of MGNREGA activities across India. MGNREGA assets are spread across the country at different densities. To represent them spatially, the Yuktdhara portal will serve a repository of geo-tagged assets that have been created under several national rural development programs such as MGNREGA, Rashtriya Krishi Vikas Yojana, Integrated Watershed Management Programme, Per Drop More Crop, etc along with field photographs.

Onlinemaps Portal, SARTHI, and MANCHITRAN – Launch of 3 Online Applications to Purchase Geospatial Data Collected by Govt. Organizations

The Govt. of India in Feb 2021 announced the liberation of the Geospatial Policy of India. It has announced a new Geospatial policy to unlock new avenues for business, private sector, and research institutes to build applications and drive innovation in the creation of digital public goods. The launch of 3 online applications comes with nearly six months of new Geospatial policy. The 3 online applications are –

1. Onlinemaps Portal – a Geospatial data dissemination Portal by Survey of India (SOI)
2. SARTHI – a Web GIS Application Portal by Survey of India (SOI)
3. MANCHITRAN – an Enterprise Geoportal by National Atlas & Thematic Mapping Organisation (NATMO)

GIS application that utilizes the new advancements in web application development with GIS tools like spatial data visualization, manipulation, analysis, etc., and will be easily accessible to the user with less utilization of resources at the client's end. It enables cross-organizational collaboration in consonance with the new Geospatial Policy.

Hexagon Introduces HxGN MineMeasure to Maximise Ore Recovery

Hexagon AB has announced the launch of HxGN MineMeasure, a tailored solution combining blast design software, high-precision drilling, blast movement monitoring, fragmentation analysis and enterprise analytics. MineMeasure drives excellence and focuses on the incremental improvements that ultimately lead to elite performance, putting data to work in the delivery of high-value ore. It empowers customers with a data-driven feedback loop, calibrated to increase profit from every blast while minimising ore loss.

YellowScan Announces New Long-Range, Multi-Platform LiDAR Solution, the Explore

YellowScan, a global leader and designer of next generation of UAV LiDAR solutions, has announced the launch of latest technological innovation, the YellowScan Explorer. The Explorer can be mounted on a light manned aircraft or switched to different types of UAV platforms. This is the first compact, long-range platform of its kind to hit the market and its versatility allows the end-user to tackle a wide range of projects and mission profiles with the proven ease-of-use that YellowScan's LiDAR solutions are known for.

SimActive Develops Workflow for New DJI L1 LiDAR System

SimActive has announced an enhanced software workflow for DJI users operating their new L1 LiDAR systems. It allows the validation of LiDAR point cloud accuracy, the transfer of photo identifiable control from LiDAR to imagery, and the colorization of LiDAR with color balanced mosaics. In conjunction with their DJI L1 LiDAR system, SimActive Correlator3D™ software enhances the data captured allowing it to create robust deliverables, while minimizing field work and processing time per project for their topographical surveys.

GEO EVENTS

September 27 – 30, 2021
11th international Conference on Geographic Information Science
Poznań, Poland
https://www.giscience.org/

September 27 – October 2, 2021
FOSS4G
Online
https://2021.foss4g.org/

October 11-14, 2021
3D GeoInfo 2021
Online
https://3dgeoinfo2021.github.io/

October 25-28, 2021
Northwest GIS User Group conference
Yakima, Washington, USA
https://nwgis.org/nwgis2021

November 16 – 18, 2021
4th International Conference on Geomatics Applications
Istanbul, Turkey
https://waset.org/geomatics-engineering-and-land-surveying-conference-in-november-2021-in-istanbul

November 26 – 27, 2021
GeoMundus
Online / Lisbon, Portugal
https://geomundus.org/2021/

December 14 – 18, 2021
30th International Cartographic Conference
Florence, Italy
https://www.icc2021.net/

Esri Releases New Predictive 2050 Global Land Cover Map

Esri has announced it is releasing a new high-resolution, 2050 global land cover map as part of the company's Living Atlas. Built in partnership with Clark Labs and using European Space Agency (ESA) 2010 and 2018 climate change initiative (CCI) satellite imagery, the map lets users see how the world's land cover will change 30 years into the future.

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AEC Next Technology Expo & Conference, International Lidar Mapping Forum, and SPAR 3D Expo & Conference, along with partner events ASPRS Annual Conference and USIBD Annual Symposium, are coming together in 2022 to form Geo Week. Each event features its own unique conference programming and combines in a single exhibit hall and inclusive networking activities. Welcome to Geo Week!

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