Converging Technologies: Towards Accessible 3D Data Capture for Surveying

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SUMMARY

Surveying practices are being reshaped by the convergence of positioning, visualization, and mapping technologies. This presentation examines how the integration of GNSS, augmented and virtual reality (AR/VR), LiDAR, SLAM, and cloud processing is enabling more accessible and efficient 3D data capture.

The combination of real-time GNSS with AR/VR tools supports precision stakeout and situational awareness by allowing surveyors to visualize designs and terrain directly in the field. At the same time, advances in airborne and terrestrial LiDAR, complemented by handheld and mobile mapping systems, provide flexible solutions for environments ranging from open landscapes to urban corridors and indoor spaces.

A central element is the unification of these data streams through cloud-based platforms, where automated processing generates coherent, accurate, and ready-to-use deliverables. This approach reduces fragmentation, accelerates workflows, and enhances adaptability to diverse project needs.

The session will present examples of integrated applications and discuss the broader implications of these converging technologies for the future role of surveyors in a rapidly changing geospatial landscape.