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Kudan Inc.

## Kudan 3D-Lidar SLAM (KdLidar) in action: In a subterranean cave for geospatial applications

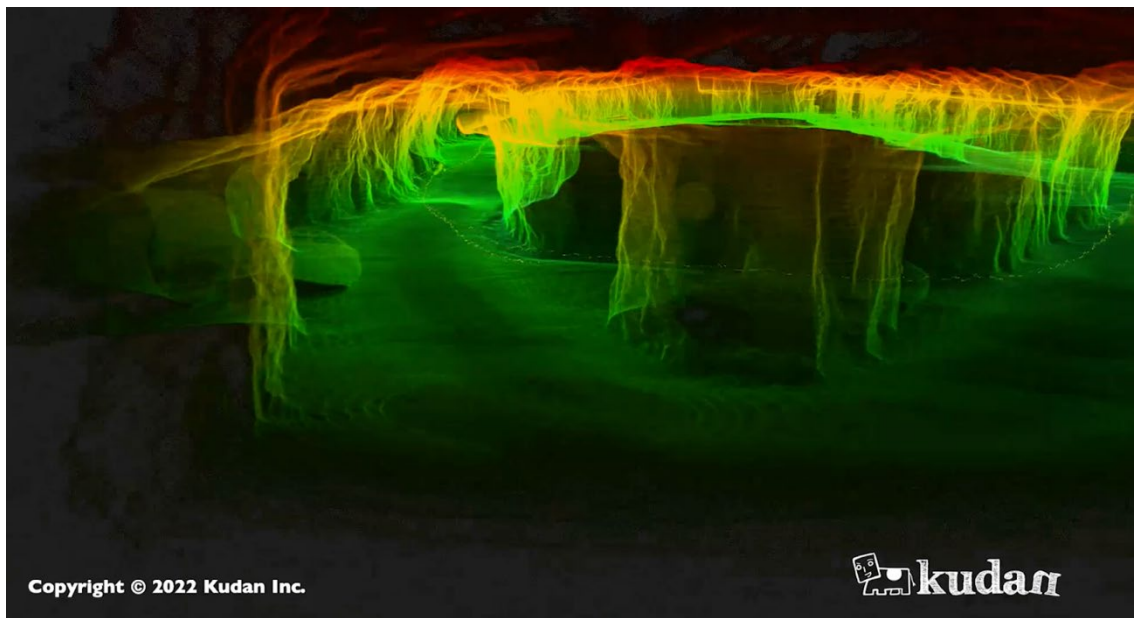
We shared our SLAM in action in typical environments for robotics in the past. We decided to shift gears this time, and share an example of SLAM in a setting that we feel is well suited for lidar and lidar SLAM. It's a subterranean cave - limited light, a lot of variable natural features, and no GNSS signals!

This data was collected by a handheld device with a 3D-lidar. As some of you already know, underground environments are one of the more challenging environments for conventional geospatial equipment due to the unavailability of GNSS and complex structure.

The video shows how KdLidar works in this environment to collect data, and create a beautiful point cloud.

[Kudan Lidar SLAM: In an underground cave](#)

Try to guess what sensor we used for this work while you are watching this video!



Many existing solutions only allow you to see the output once you store the data and process it offline, and you cannot see how the scanning work is going during the capturing process or immediately after it. This can potentially lead to significant loss of productivity. As you can see, the user is able to have a good understanding of how the scanning is going

in real-time (as the point cloud is being generated), and then create a denser and more crisp point cloud in post-processing.

One thing to note, is that this data was collected only using an Ouster OS0-32, without using its internal (or an external IMU, and obviously without GNSS). Lidar SLAM without IMU in a handheld configuration is another major challenge due to continuous natural human motions, which can cause ghosting, blurred points and trajectory drift.

Our partner, who collected this data, was quite satisfied with the final result for their mapping purpose. However, if you want consistently good-looking results, with higher accuracy, we can boost the performance with more tuning and sensor fusion of IMU.

Here are some of the details of the environment, and demo parameters.

- Size of the area: 100m x 70m (or 330 ft x 230 ft)
- Sensor: Ouster OS0-32 3D lidar: Only lidar, without further sensor fusion (however, we can utilize other sensors if needed)
- The map was generated after successful loop closure

We hope you are enjoying this “Kudan SLAM in action” series as you get to see Kudan SLAM’s robustness, accuracy, reliability and flexibility in real environments.

## **About Kudan Inc.**

Kudan (Tokyo Stock Exchange securities code: 4425) is a deep tech research and development company specializing in algorithms for artificial perception (AP). As a complement to artificial intelligence (AI), AP functions allow machines to develop autonomy. Currently, Kudan is using its high-level technical innovation to explore business areas based on its own milestone models established for deep tech which provide wide-ranging impact on several major industrial fields.

For more information, please refer to Kudan’s website at <https://www.kudan.io/>.

### ■ Company Details

Name: Kudan Inc.

Securities Code: 4425

Representative: CEO Daiu Ko

■ For more details, please contact us from [here](#).

