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Kudan Inc.

Kudan Visual SLAM (KdVisual) in action: In an operating factory for autonomous mobile robots

We shared how Kudan 3D-Lidar SLAM (KdLidar) works in a shopping mall in the [previous post](#). Next up, we would like to share Kudan Visual SLAM (KdVisual) working in a factory.

KdVisual demonstrates robust and stable tracking/localization on the map throughout the demo video below. Realsense D455 was mounted at the front of the autonomous guided vehicle (AGV) as shown in the image. The data was recorded during operating hours of a factory in Asia thanks to ROSTEK Vietnam. We ran KdVisual on the recorded images and depth data at real-time speed.



Here is the demo video:

[Kudan Visual SLAM \(KdVisual\) in action: In an operating factory](#)

Challenges KdVisual can solve for AGVs and AMRs

KdVisual is designed to overcome some of the typical challenges other visual SLAM and positioning approaches may struggle with, while managing to run with a low-power computing platform.

1. Moving objects and workers in front of the robot: SLAM system calculates the robot's pose and movement based on how objects in the camera's field of view

(FoV) move. When there are moving objects or people occupying a portion of the FoV, these movements can confuse SLAM systems and result in deteriorated accuracy. As you can see, there are many carts and people moving and passing by, and in close proximity to the camera in the demo, it could have easily made the robot trajectory inaccurate but KdVisual can handle this with ease.

2. Scenery changes: When there are some changes in the environment from the time when the map was created, this can usually result in loss in position tracking or inaccurate positioning. However, KdVisual can manage these types of dynamic environments with its unique approach in how it has implemented SLAM, based on years of real-world experience, and focus on accuracy and robustness. As you can see in the video, there are mobile storage carts, and temporary shelves throughout the facility, which can create challenges for SLAM in general.

Repeatable/relative accuracy

Repeatability and repeated accuracy are important factors within factory and warehouse environments. With our own testing, as well as, tests by customers on customer sites, KdVisual consistently achieves positional error rates under 1cm. This enables AGVs and AMRs to stop at designated loading and unloading points accurately to perform pickup/dropoff operations, as well as, charge themselves at a charging station.

There are more features and facts we want to show off, but let's save them for future posts!

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](#).

