Larger Sensor, Mechanical Shutter,

Precision in Point Cloud.

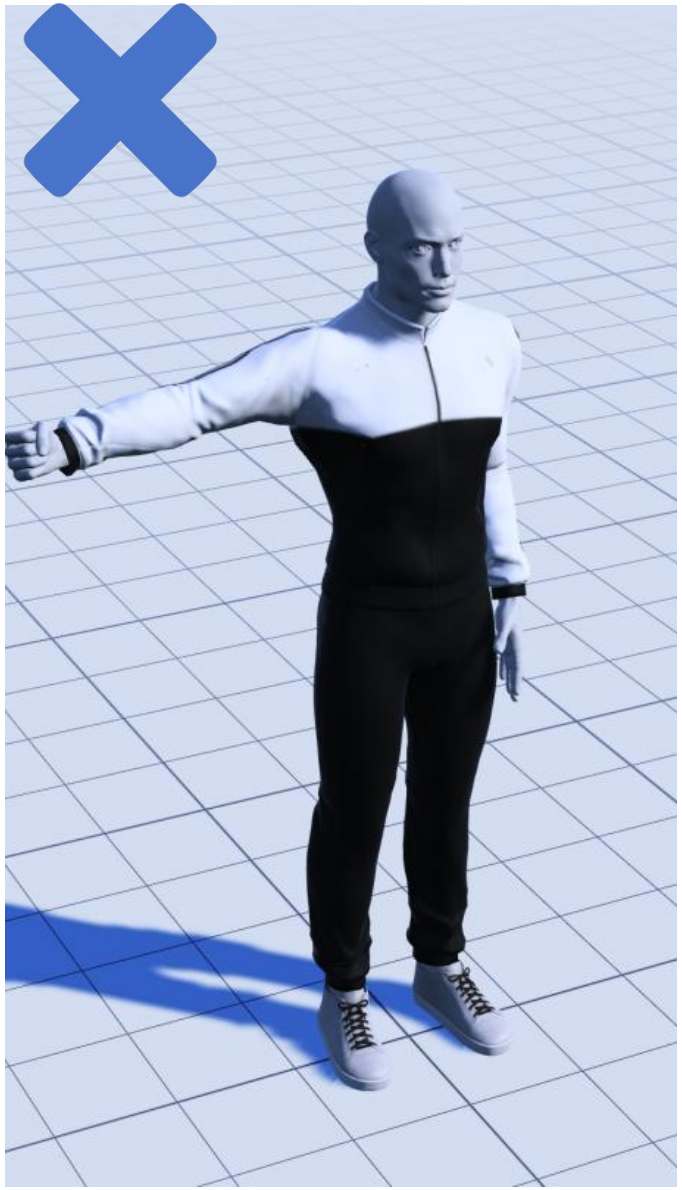
SHARE SLAM S20

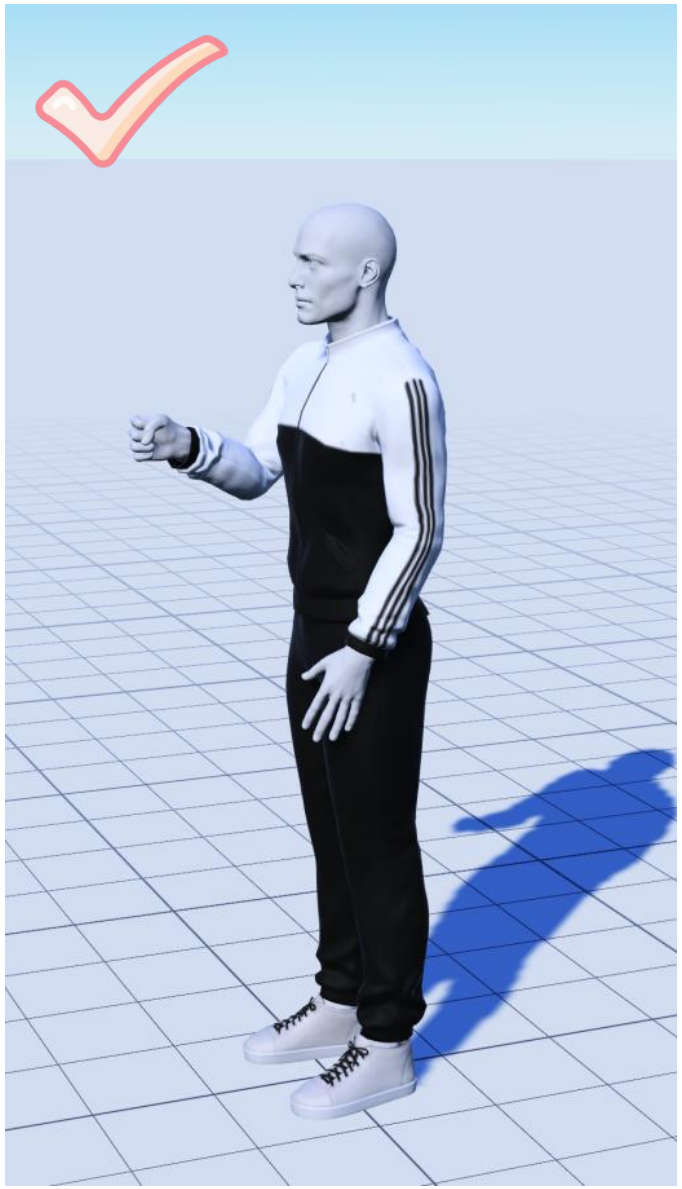
Handheld 3D LiDAR Scanner

Scannig Guide

Scanning Posture

Maintain the device in a vertical position directly in front of your body. Avoid tilting or holding the scanner at an angle.





Pre-Scanning Preparation

To ensure optimal data collection quality, prepare the scanning environment as follows:

1. Conduct a preliminary survey of the scanning area and activate all doors and lighting systems before entry.
2. Remove obstacles and obstructions from the scanning path.
3. Ensure the scanning area is clear of personnel during operation
4. Verify battery charge level.
5. Confirm SD card insertion and adequate storage capacity.
6. Clean camera lenses and verify radar protective cover integrity.

Initialization Procedures

The S20 employs time-of-flight laser ranging technology. To prevent mapping accuracy errors, strictly adhere to application instructions during initialization:

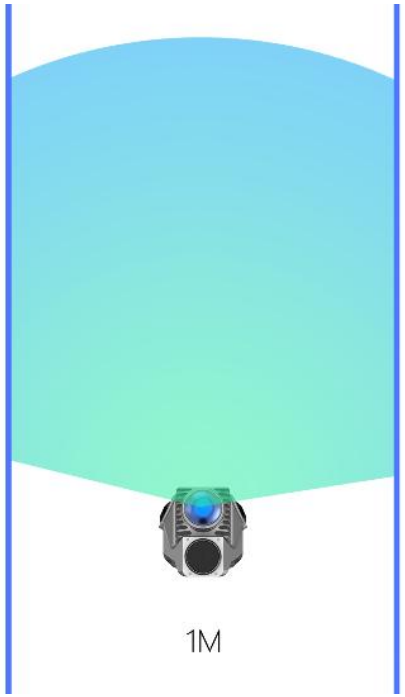
1. Select a feature-rich environment; position the scanner at an elevated location, preferably on a desk or elevated surface.
2. During initialization, orient the device toward the measurement target (e.g., tunnel entrance or building facade).
3. Avoid initialization in open areas such as plazas or fields.
4. In vegetation-rich areas, perform initialization in windless conditions
5. Maintain minimum 1-meter clearance from walls.
6. Avoid initialization near dynamic objects (intersections, fields, water bodies).
7. Avoid initialization near highly reflective surfaces (dance studios, restrooms, glass walls).

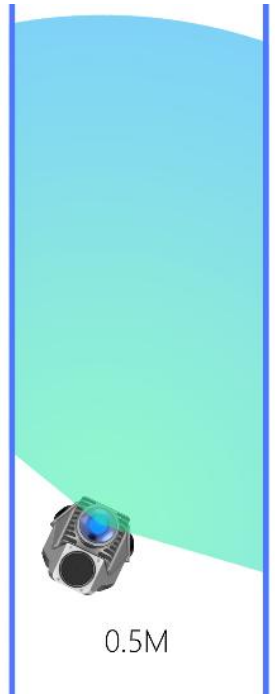
Measurement Range

The S20 has a scanning range of 0.1m to 70m. However, LiDAR data captured between 40m and 70m is used only for real-time positioning during scanning and will not be included in the final mapped point cloud.

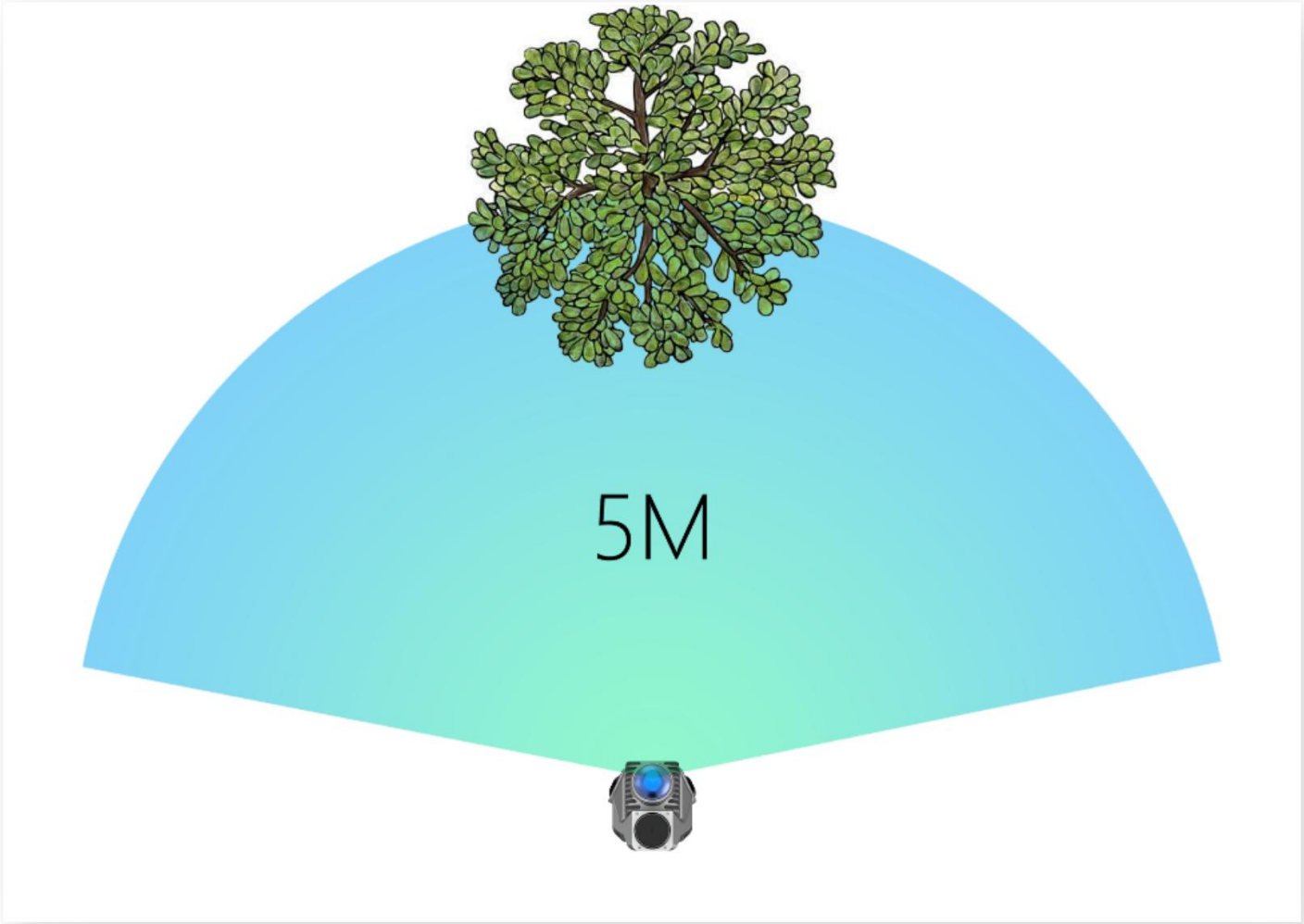
Minimum Range: The radar cannot acquire accurate point cloud data within 0.1m proximity. Data closer than 0.1m will be masked in SHARE PointClouds Studio.

Therefore, during scanning operations, it is recommended to avoid close proximity to walls and ceilings whenever possible. When scanning in confined spaces, try to keep the device centered to ensure data capture from both sides. Avoid entering spaces narrower than 0.5m if possible. If unavoidable, position the scanner at a 45-degree angle against one wall to ensure proper functioning of the mapping algorithm.





Measurement Range



Maximum operational distance: Under optimal conditions, the S20 can capture point cloud data within a 40m range. However, in most scenarios, the LiDAR maintains best ranging accuracy within 5m–20m.

We recommend keeping the distance between the LiDAR and target objects within this 5m–20m range to ensure high-quality point cloud results.

Movement Speed

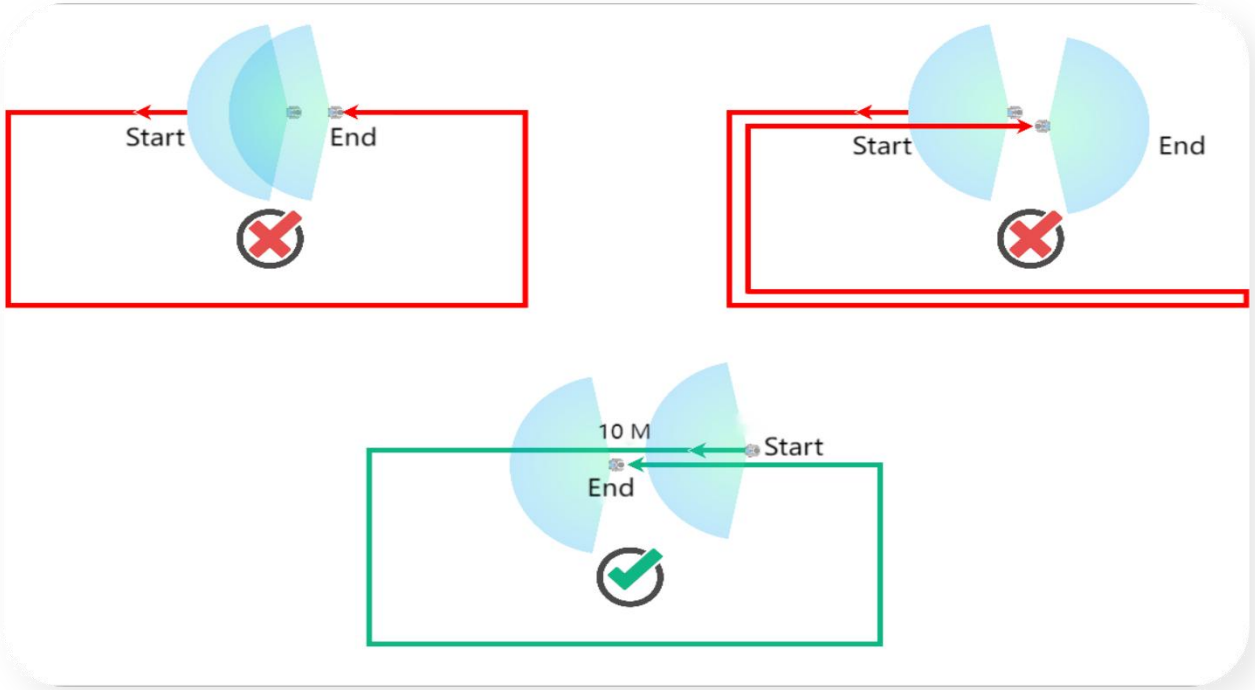
For standard scenarios, maintain a movement speed of 1m/s. In confined spaces (e.g., tunnels, corridors), reduce speed to below 0.5m/s for optimal data capture.

The S20 LiDAR employs non-repetitive scanning technology. To increase point cloud density in a scene, keep the device stationary for a period to allow complete coverage before moving to the next location.

Scanning Path Planning

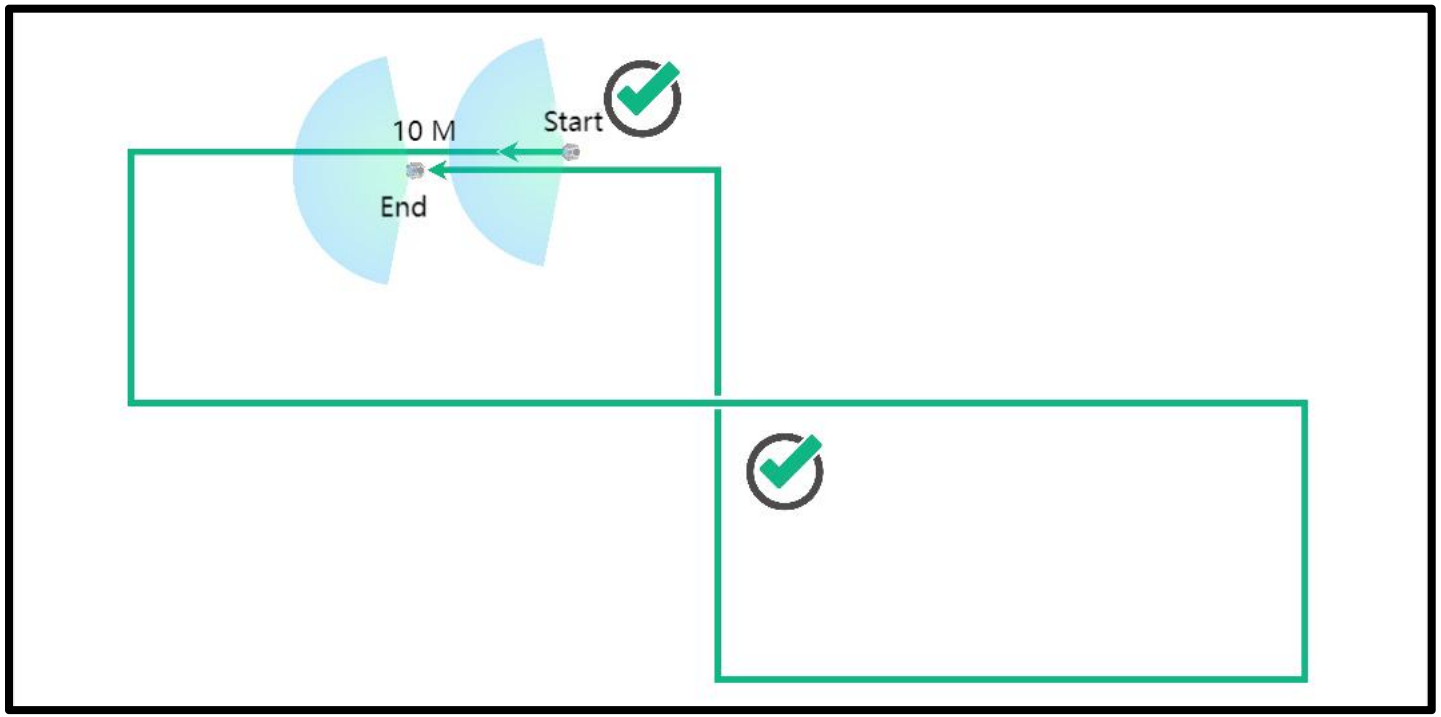
Closed-Loop Trajectory: Ensure the scanning path forms a closed loop by connecting start and end points. Loop closure effectively reduces cumulative error accumulation.

Whenever possible, form an 'O'-shaped loop closure instead of retracing your path, ensuring 10-20m of overlapping trajectory. The recommended path is illustrated below:



In SLAM (Simultaneous Localization and Mapping) workflows, point cloud data gradually accumulates errors over scanning time. To mitigate these cumulative errors, it is critical to implement frequent loop closures.

Scanning Path Planning



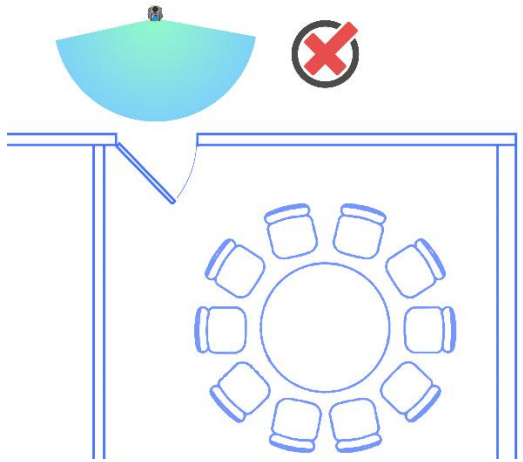
During scanning, deliberately revisit previously scanned areas to form '8'-shaped loops. Each completed loop reduces accumulated error.

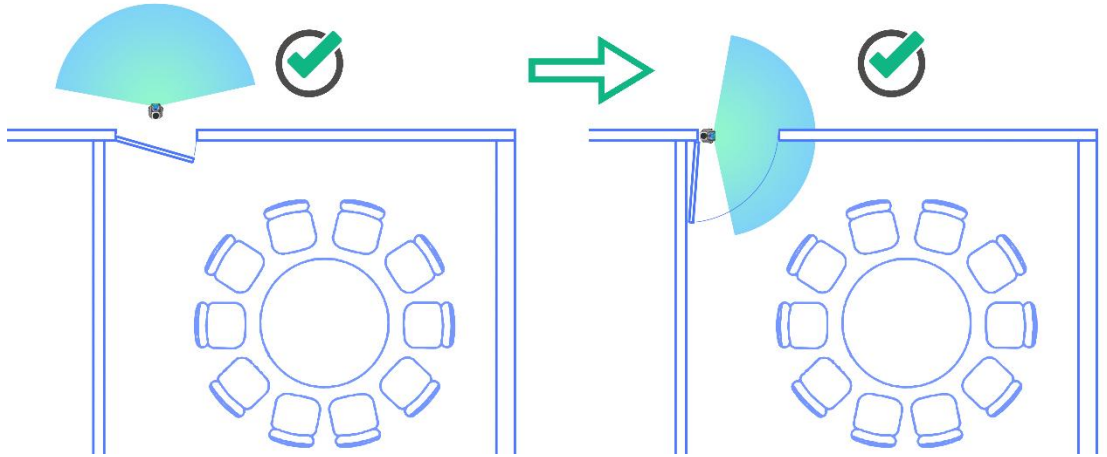
Scene Transition

When transitioning between scanning environments, the scanner must re-establish feature matching between scenes. Follow these protocols for smooth algorithm operation:

Room Transitions: For narrow doorways, slowly enter sideways with the device held steady against your chest, maintain visual continuity: Pause for 3-5 seconds to allow feature matching.

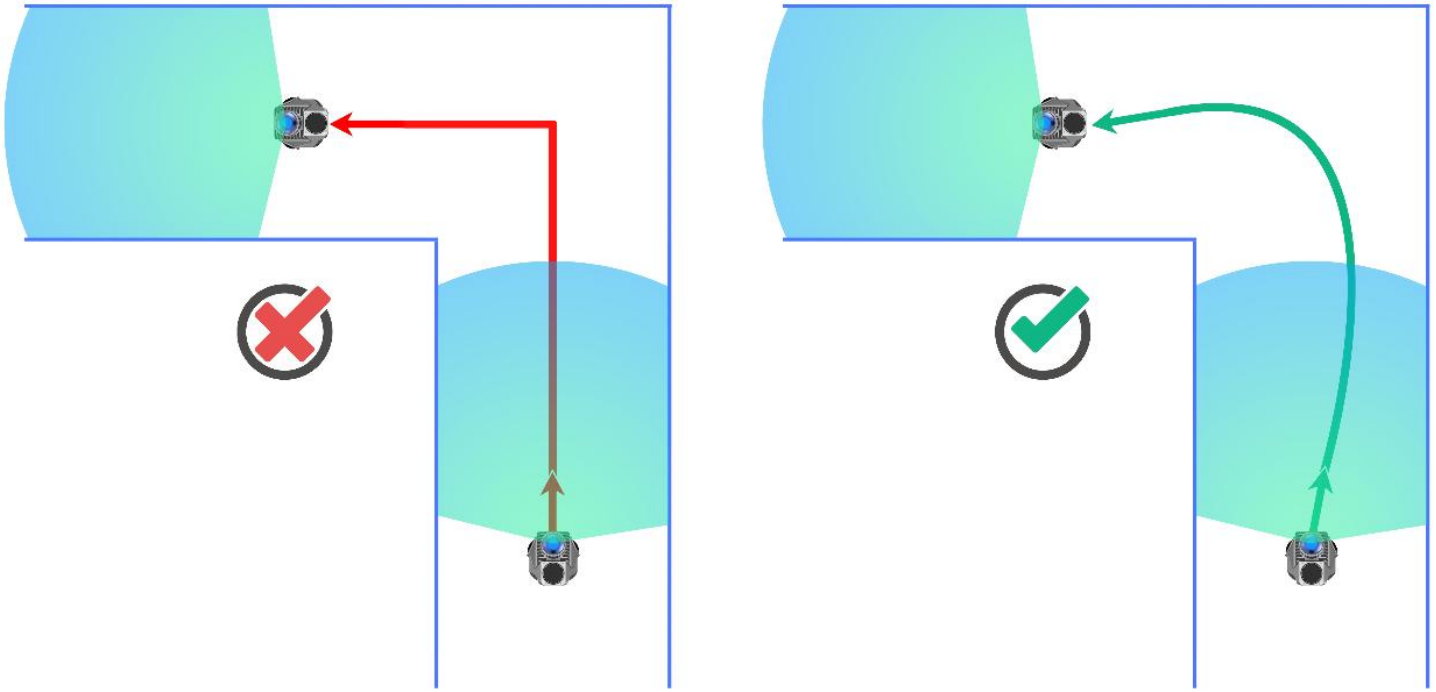
Avoid scanning doors while they're in motion. If a closed door must be opened: Stand with your back to the door Push it open slowly while keeping the scanner stationary avoid mapping errors caused by synchronous movement of the scanner and the door.





Scene Transition

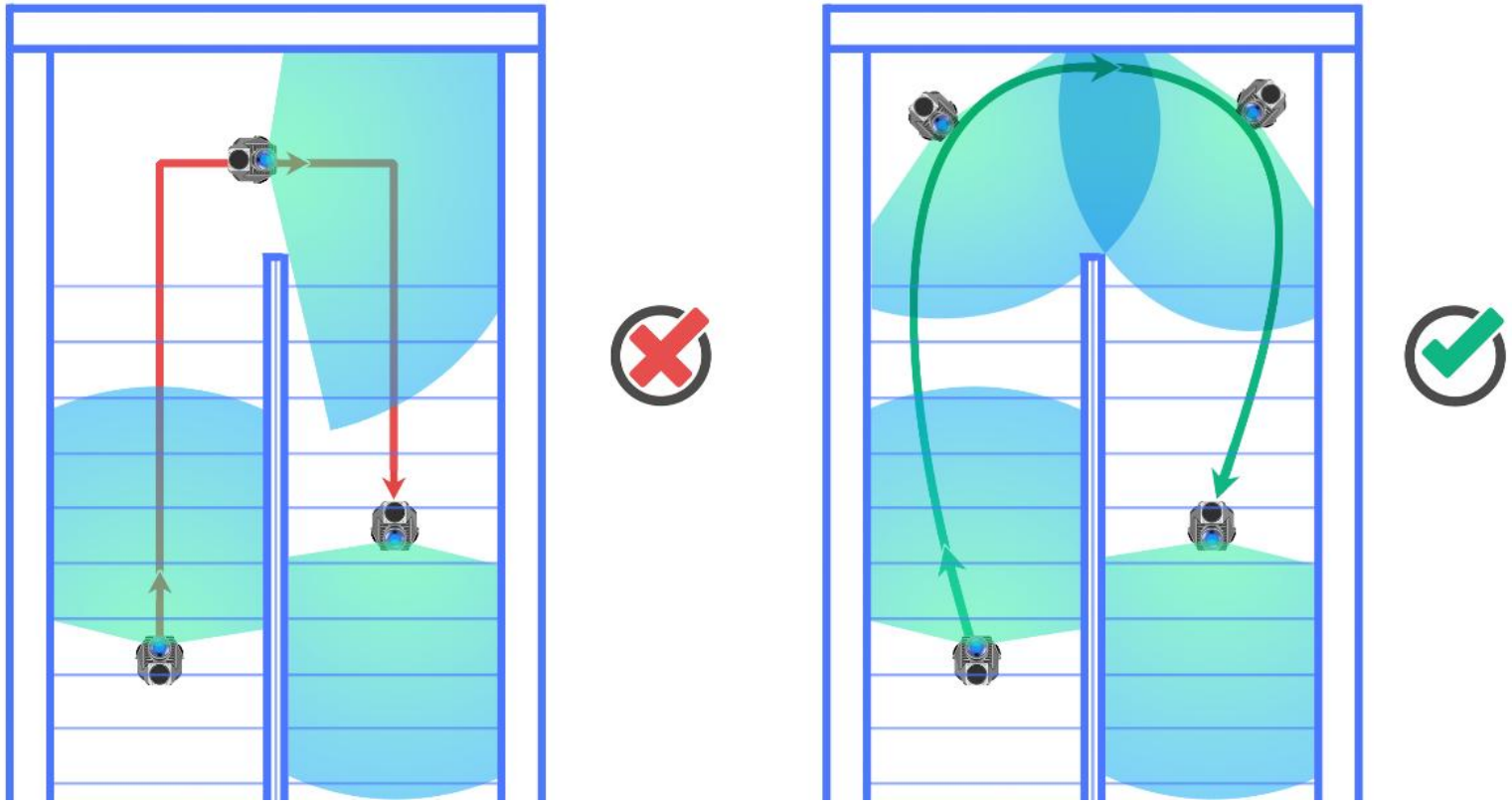
Corridor turning: When scanning at the corners of corridors, especially narrow corridors, you can slow down appropriately to increase the turning radius. During the turning process, keep the front of the scanner facing the inner corner of the turn to avoid mapping errors caused by excessive angular velocity;



Scene Transition

Stair turning: Similar to corridor turning. Keep the LiDAR facing the handrail inside the turn and avoid the user's body blocking the LiDAR.

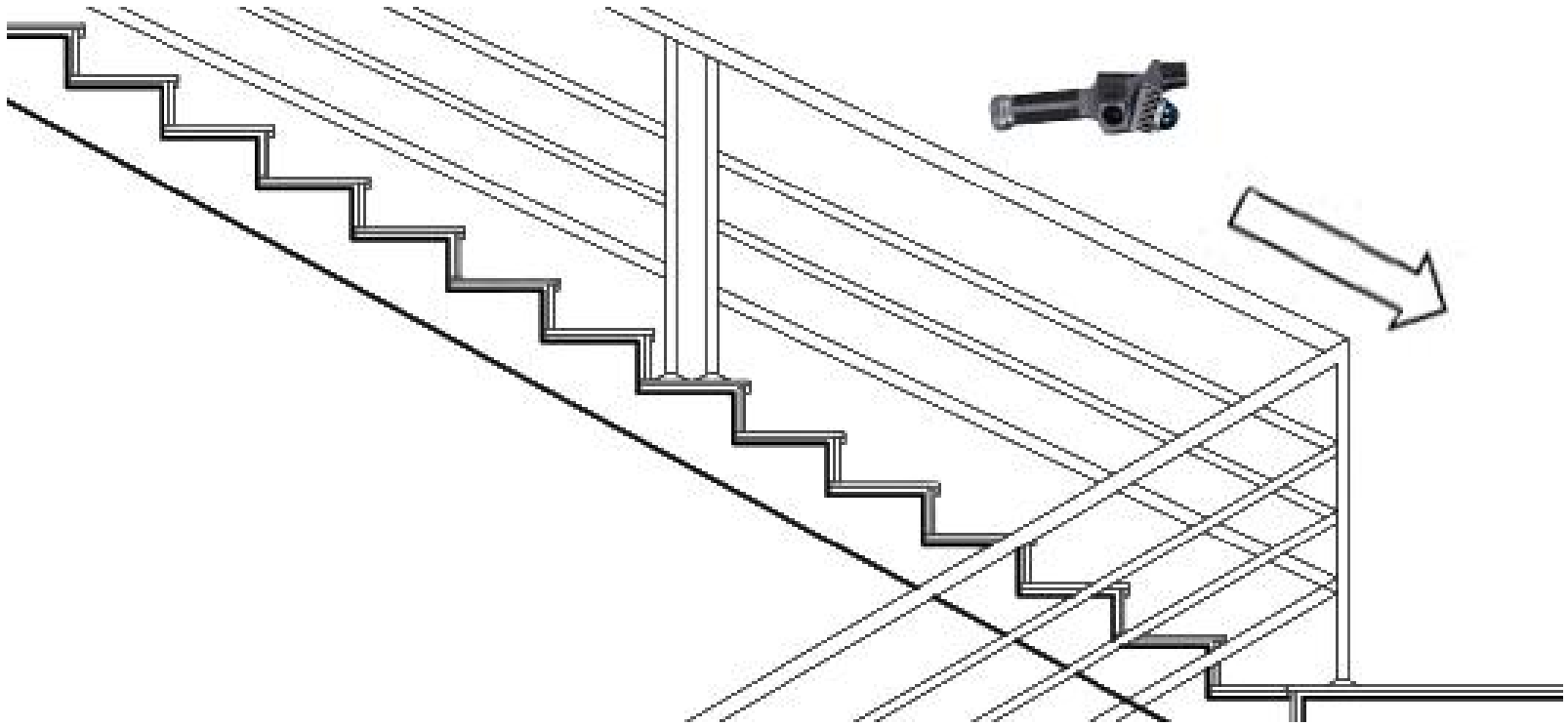
Turning around on the spot: The method is similar to the stair turning scenario.



Special Scenarios

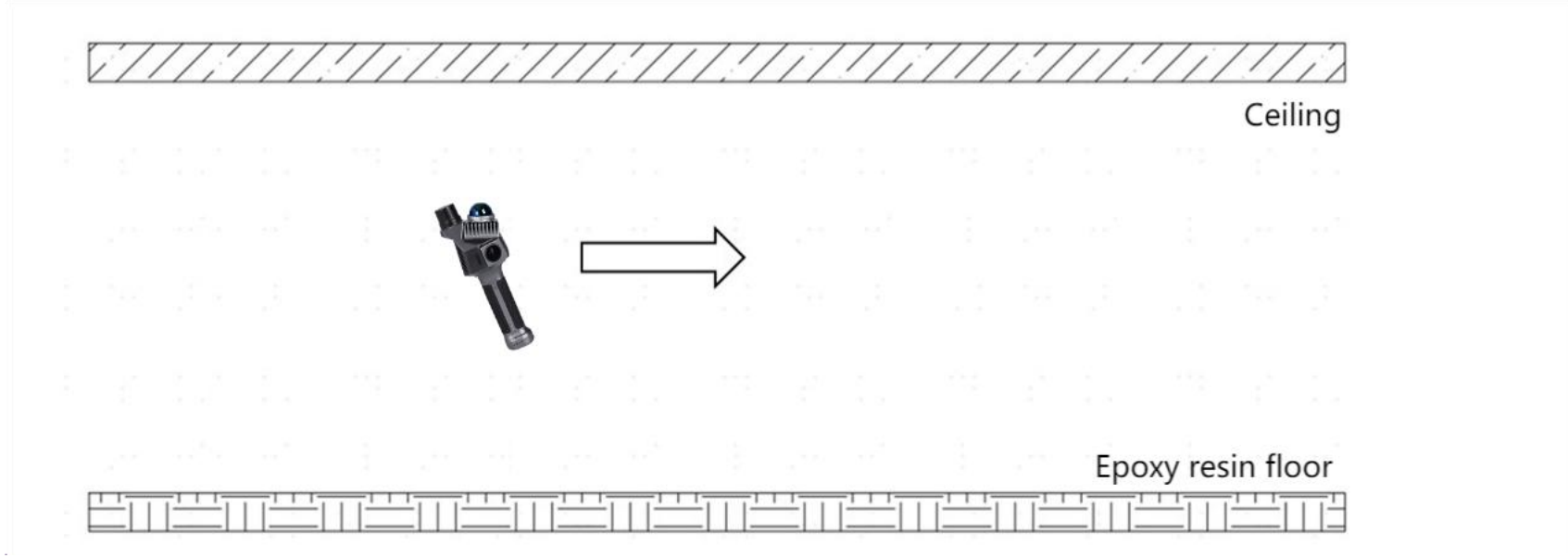
In some scenarios, the mapping effect may not be good. You should pay attention to the following points when using it:

Staircase scene: Especially when going down the stairs, the treads and risers of the stairs may not be fully scanned due to the lower blind spot of the LiDAR. Tilt the scanner downward appropriately can ensure the collection of ground points in the stairwell and also increase the normal constraints for mapping.



Special Scenarios

Epoxy resin floor paint garage scene: Due to the high reflectivity of the epoxy resin floor, the LiDAR spot may be enlarged, resulting in Z-axis drift. When scanning this scene, the scanner can be appropriately pointed upward to reduce the impact of ground points on the map.



Special Scenarios

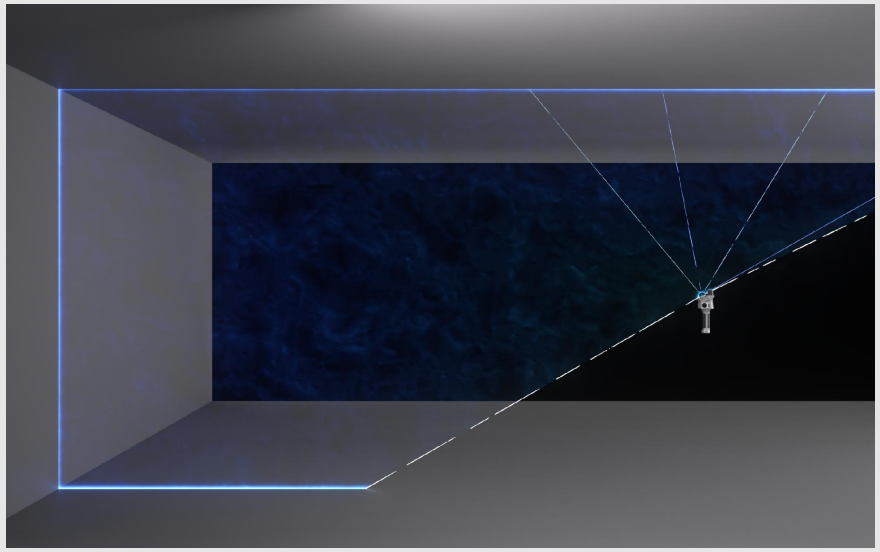
Glass curtain wall scene: Glass walls will reflect a lot of laser emitted by the LiDAR, resulting in scanning and mapping errors. It is not recommended that the device be used for scanning in such environments.

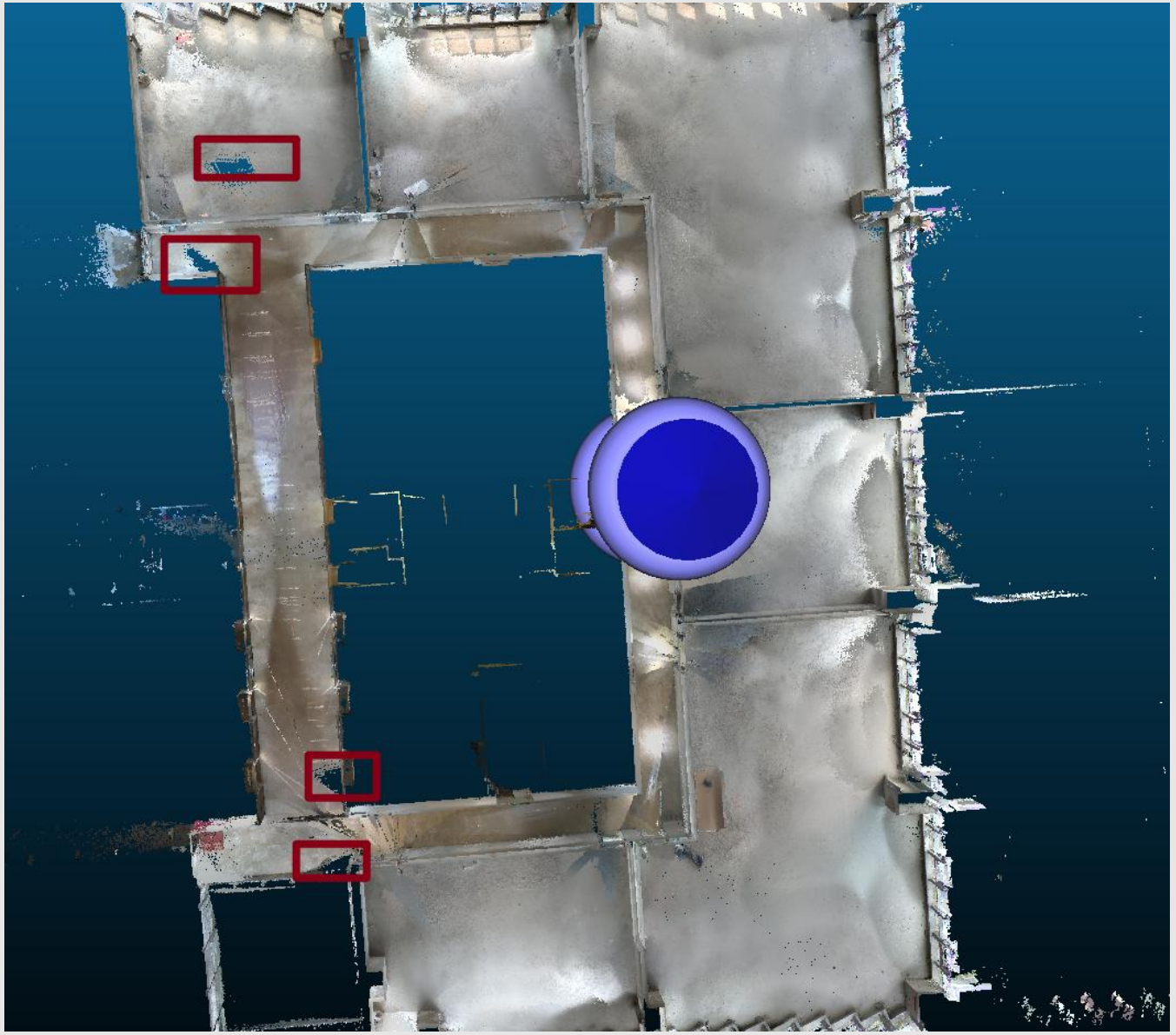
High-rise building scene: When using RTK, there should be a satellite line of sight condition with a ground elevation angle of more than 10°, and the elevation angle of obstacles in the field of view should not exceed 10°.

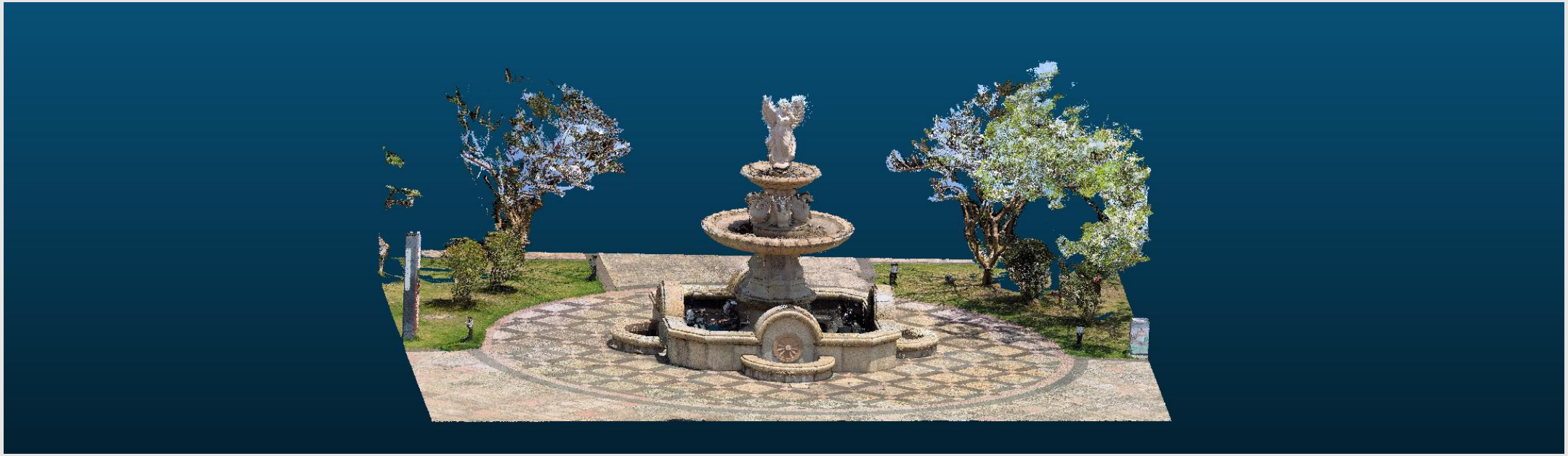
High noise scene: When there are a large number of floating objects in the scene, such as construction sites without dust reduction, mines that have just been blasted, rainy and snowy weather, etc., a large number of noise points may be generated in the point cloud data. It is not recommended that the device be used for scanning in such an environment.

- Areas prone to missing points

Since the device has a blind spot under the feet, it is easy to miss the ground at the corner when working in a small space. Pay attention to the preview point cloud in the App when scanning.







Circle around the area or object of interest. With the object or area of interest at the center, capturing from multiple angles ensures more accurate edges and more complete coloring. Alternatively, in areas with complex obstructions, images from more angles can effectively improve the completeness of the coloring.

Precautions

- Acquisition posture: When scanning, keep the device directly in front of the body, and try not to hold the device sideways or obliquely.
- Preparation before scanning: Familiarize yourself with the scanning site, turn on the doors and lights in advance when scanning enters, and remove obstacles and obstructions.
- Walk loopback when RTK is turned off: It is recommended to form a loopback at about 100 - 200m, and the loopback needs to have a path in the same direction.
- When working in a small space, it is easy to see the lack of corner ground, so you need to pay attention to check the preview point cloud in the App when scanning.
- If a short-term non-fixed solution occurs when an RTK job is enabled, the data can be processed normally. If there is no solution for a long time or a single point solution, the data processing results will be affected or the data cannot be processed normally.
- Before data processing, it is recommended to copy the data to the computer for local processing to improve the processing speed.
- Please check whether your computer's memory is sufficient before data processing.

FAQ

Q1: If the project is large and the memory card is not enough to store, can it be replaced with a larger capacity?

A1: The standard configuration includes a 256GB memory card, which supports expansion; it is recommended to use a SanDisk Gold card.

Q2: How long is the single operation time of the S20 battery handle? How long does it take to charge? How long does it last?

A2: It takes 120 minutes to fully charge, and 150 minutes can be operated at a time when fully charged. The service life is about 300 battery cycles.

Q3: Does the S20 need a dongle for data processing?

A3: No, you can process the data by downloading the SHARE PointClouds Studio from the official website.

Q4: What format can S20 output point cloud data?

A4: The default output is .las format, .ply and .pcd formats can also be exported

Q5: Can I export mesh models from S20 data?

A5: Photos and point clouds captured by S20 can be modeled by third-party modeling software.