If

① Stereo (Baseline)
* use disparity maps
* poor performance in textureless terrains
* Not reliable alone

② LiDAR
* Precise 3D topography
* works well in featureless terrain
* But heavy & limited resolution

③ Depth Cam
* Dense depth maps
* works good in varying lightings
* Poor range

④ SGBM
* computational approach for depth from stereocam
* Effective with OpenCV
* relies more on texture
* cannot standalone

⑤ LiDAR+CAM
* Best approach until now
* Both the cons of LiDAR and CAM are overcomed by each other

For above any approach,
Depth camera is Must

If we go through ⑤ (The best till now)

Requirements : RpLiDAR A3
Intel realsense D455
(all other wig & small components are listed in the Inventory doc in drive)

Workflow :

① Hardware
)
listed in
Inventory doc

② Software
ROS
OpenCV
PCL (point cloud library)
MAVLink
A or Dijkstra* → for path planning
Gazebo or AirSim

Test phases (Working in sequenced parts)

The basic stage
① operation from RF without any algos / computation → just able to hover and lift weight > 2kg
② Assuming that a flat, safe spot is identified, teaching it to land safely and autonomously
③ Making an algo to make it return from any arbitrary point to a specific point (Home)
④ At last working on making a path plan after generation of 3D point cloud
⑤ Identifying emergency conditions