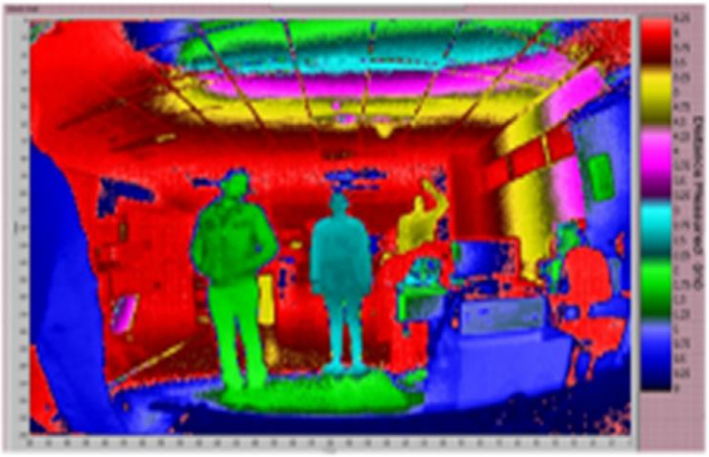
Active 3D Imaging Lidar Camera

Space Applications Centre (SAC) has developed an Active 3D imaging Lidar camera that works on Time-of-Flight (ToF) principle. The camera measures the depth of scene points using flash LIDAR (Light Imaging Detection and Ranging) technology. The depth information is determined by correlating the reflected light signal from the scene with the transmitted reference signal. The three-dimensional data obtained from ToF sensor can be used for many control and navigation applications. This technology is useful to generate intensity and depth profile of targets irrespective of ambient lighting condition.



3D Point Cloud Depth Map Using this Camera

Applications areas of the Technology:

This technology can also be primarily useful for following other application areas:

- People Detection and counting in heavily crowded place
- Mobile postal parcel size measurement for large scale logistics
- Machine Safety using depth measurement
- Helicopter Near Terrain flight assistance for assisted landing
- Hazard detection for Car Collision avoidance system
- Hazard detection for Pedestrian detection and braking system
- Body size measurement predicting the waist, hip size and further prediction of lifestyle issues.
- Man, Machine Interface like gesture recognition devices in mobile phone, TV, Xbox gaming sets, etc.
- 3D distance measurements, volumetric mapping of objects
- Space Docking between 2 docking satellites
- Interplanetary Soft Landing: Hazard Detection

Salient Features:

Sl no.	Parameters	Specifications
1	Lidar Technology	Phase detection
2	Wavelength	860 nm
3	Depth Range	up to12 meters
4	Depth Accuracy	< 10 cm for range up to 5 m
5	Update Rate (Camera)	5 Fps
6	FOV	90°x60°
7	3D Points Per frame	76800 Points per frame
8	Dimension	370 x 275 x 246 mm
9	Mass	8 Kg
10	Power	42 W (Average)

Camera Features:

- Option to view the Intensity image or the color coded depth point cloud
- Unique ambient light suppression, the camera can be used under full sunlight condition.
- Absolute accuracy in the sub-centimeter range with appropriate setup and calibration
- Dual phase mode for Motion blur reduction
- 2*2 Binning option for range enhancement.
- Dual Integration time mode (High Dynamic Range, HDR mode)
- Sensor Measurement rate up to 20 TOF frames per second and camera about 5 TOF frames per second.
- Region of interest setting to maximize the Frame rate in KHz.
- Programmable exposure time to adjust the SNR and hence the depth accuracy. Real time display to fine tune the exposure to achieve the maximum depth accuracy while avoiding pixel saturation.

Technology Transfer from ISRO

ISRO is willing to offer the knowhow of this technology to suitable entrepreneurs / industries in India. Capable manufacturing industries interested in acquiring this knowhow may write with details of their present activities, requirements and plans for implementation, infrastructure and technical expertise available with them, their own market assessment, if any, and plans for diversification to the address given below: