

16833: Visual-lidar Odometry and Mapping: Paper Summary

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1 Summary

This on-line method provides a framework combining visual odometry and lidar odometry for motion estimation and mapping, which can be used with sensors such as a monocular camera with a 3D lidar. This method does not use loop closure to emphasize the accuracy of odometry estimation. The overall system contains two sections, Visual Odometry and Lidar Odometry. The visual odometry estimates frame to frame motion of the sensor using visual images with assistance from lidar clouds, as the motion estimation problem in 6-DOF motion is solved using the Levenberg Marquardt method, fitted with a robust framework to handle feature tracking errors. The motion estimated is then further refined by lidar odometry, which contains two major steps, a sweep to sweep refinement and a sweep to map registration. Cooperation of the two components allows for accurate and robust motion estimation and mapping, subject to high speeds and significant lighting changes. [1]

References

- [1] Ji Zhang and Sanjiv Singh. “Visual-lidar odometry and mapping: Low-drift, robust, and fast”. In: *2015 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE. 2015, pp. 2174–2181.