

## **A laser-SLAM Algorithm for Indoor mobile Mapping**

Mr. Kai SUN

Director of Leador R&D Center

Leador Spatial Information Technology Co., Ltd., China

### **Abstract:**

A novel Laser-SLAM algorithm is presented for real indoor environment mobile mapping. SLAM algorithm can be divided into two classes, Bayes filter based and graph optimization-based. The former is often difficult to guarantee consistency and accuracy in large-scale environment mapping because of the accumulative error during incremental mapping. Graph optimization-based SLAM method often assume predetermined landmarks, which is difficult to be got in unknown environment mapping. And there most likely has large difference between the optimize result and the real data, because the constraints are too few. This paper designed a kind of sub-map method, which could map more accurately without predetermined landmarks and avoid the already-drawn map impact on agent's location. The tree structure of sub-map can be indexed quickly and reduce the amount of memory consuming when mapping. The algorithm combined Bayes based and graph optimization based SLAM algorithm. It created virtual landmarks automatically by associating data of sub-maps for graph optimization. Then graph optimization guaranteed consistency and accuracy in large-scale environment mapping and improved the reasonability and reliability of the optimize results. Experimental results are presented with a laser sensor (UTM 30LX) in official buildings and shopping centers, which prove that the proposed algorithm can obtain 2D maps within 10cm precision in indoor environment range from several hundreds to 12000 square meter.

Presenter



Kai SUN

Director of Leador R&D Center