ADVANTAGES OF USING SLAM BASED TECHNOLOGIES IN THE WOODS FOR GLOBAL POSITION DATA

Dave Duggins, Kaarta, Inc, Pittsburgh, PA, USA

Recently, many UneXploded Ordinance (UXO) mapping efforts in wooded areas have started using Simultaneous Localization and Mapping (SLAM) technology to replace/augment Robotic Total Stations for generating global position data. This process involves creating a 3D Geo-referenced map of wooded areas for generating global position data in the woods for Advanced Geophysical Classification and Digital Geophysical Mapping Sensors. This talk will lightly touch on the process used for the creation and geo-referencing of the maps, and evaluating their final accuracy. The presentation will cover some lessons learned in the initial mapping process and the actual localization process when the global position is transmitted over the serial interface. Slides will cover topics such as customizing the GPS NMEA Positional Data string to include roll, pitch, yaw, and localization confidence data. Additional slides will cover visualization of the point cloud data, and the creation of terrain maps. The presentation will also cover the creation of contour maps, terrain steepness maps, and obstacle maps. These obstacle maps can be created in .shp format suitable for comparing against coverage maps in order to validate that all areas have been covered. The presentation will also discuss generating tree Diameter at Breast Height for forestry applications. Finally, the presentation will give recommendations on how to create maps of large areas with limited computing resources.