INFUSE- ACCURATE AND EFFICIENT INDOOR LOCALIZATION USING MOBILE SENSOR FUSION

***Abstract*—Contemporary indoor location and navigation systems suffer from scalability issues, and therefore, they are not widely deployed yet. The majority of existing approaches rely on additive beacon infrastructure that generates RF signals for location calculations. The beacon approach is unsuitable for global deployment since it requires expensive installation and long calibration times as well as increased smartphone battery consumption. Other available approaches require a constant internet connection or assume a constant camera use. We present a software only method for indoor location and navigation. Realizing that each individual smartphone sensor is low-cost and often provides inaccurate measurements, our method is based on the fusion of smartphone sensors via a modified version of a particle filter. The proposed method utilizes sensors widely available in common smartphones, achieving accurate indoor locations without pre-prioritizing any sensor. Other noticeable features of the proposed method is full on-board operation, without the need of any additional infrastructure, hardware or server connection, as well as maintaining very low computational complexity, efficient battery consumption, fast deployment times and Flight-mode operation. Experimental results demonstrate its performance and advantages compared to available approaches in the field.**