PROJECT IDEAS:

These are just prospective ideas that interested me. We could always implement a different technique to solve the same application or apply the algorithm for a different scenario.

1. Orientation tracking using UKF

UKF is used to predict the orientation of a rigid body. Orientation can be represented in several ways like Euler angles, Rotation vectors (axis/angle), 3x3 matrices, Quaternions etc. In most of the papers on estimating orientation, I found them to represent orientation as quaternions, which I guess is mainly for complexity reduction. These are few papers on this idea: each has a different application, like assisting in surgery, detecting orientation of camera and generating a panorama of the images captured using that camera and so on…

<https://pdfs.semanticscholar.org/3085/aa4779c04898685c1b2d50cdafa98b132d3f.pdf>

<https://github.com/yrlu/orientation_tracking-unscented_kalman_filter/blob/master/report/ese650proj2_luyiren.pdf>

<https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7027847>

1. DeepSLAM

SLAM produces a geometrical map of the environment; DL could be used to add semantic context to it, thus producing a geometrically-accurate and information rich map.

<https://arxiv.org/abs/1707.07410>

1. SLAM in AR

SLAM can be used for AR applications to recognize 3D objects & scenes, as well as to instantly track the world, and to overlay digital interactive augmentations. Check out Wikitude, KinectFusion!

<https://www.researchgate.net/publication/232638940_Simultaneous_Localization_and_Mapping_for_Augmented_Reality_PDF>

<https://www.spiedigitallibrary.org/conference-proceedings-of-spie/10666/106660S/Augmented-reality-integration-of-fused-LiDAR-and-spatial-mapping/10.1117/12.2304977.short?SSO=1>