EKLT has many parameters that can be finetuned

Furthermore, in the UKF, in addition to the “standard” parameters such as process and measurement noise, and the ratio between them, which can be considered as tuning parameters, this implementation of events and the concept of pseudo frames adds a new parameter: the integration/accumulation time. This is an interesting parameter to tune, and depends greatly on the scene.

Low values are best for low-paced scenes, which produce few events, but do not take full advantage of event cameras, as their update frequency is similar to that of conventional cameras, without the added benefit of well-studied algorithms for conventional cameras. Nevertheless, low values may still be interesting in order to reduce the update steps in scenes with dynamic movements (subject to motion blur), where conventional cameras would fail to keep track of features.

High values better take advantage of the high temporal resolution nature of events, and allow for better usage of features in high dynamic environments. Nevertheless, too high update frequency can result in too few features available in the update step, which result in a loss of quality.

As such, this parameter needs careful consideration. ###Ver se vale a pena falar de técnicas adaptativas caso chegue a implementar

Results

Single axis rotation are results are presented. This movement is good to test the various parameters, and the correct working of the filter, but is not without its problems. In particular, rotation movement can be somewhat explained by small translations, as can be seen in the plots, and the lack of IMU information for an axis means that vision takes over, and vision is not without its flaws, which results in noise in the estimation and wrong movement estimation.

This behaviour is normal when we compare it to a cyclopic human, as no depth information is extractable from the environment (no triangulation or trilateration is possible), and visual information can become misleading, without using priors (such as object relative sizes).