Filtering

1. Complexity grows quadratically with #landmarks. ~20 are tracked
2. Structureless approach is elegant. landmarks are eliminated [5] but previous poses to be kep via stochastic cloning [13].
3. All measurements need to be ready before being used. Inefficient since we are not using all info.
4. Marginalization causes errors to be locked. And there could be potential outliers
5. Linearization errors cause drift and eventually render the system inconsistent => overconfident => estimates of covariance isn't correct => non-optimal fusion of different measurements.
6. Wrong linearization adds spurious information in the yaw direction => rendering only 3 unobservable directions. [1, 15, 19] gives detailed analysis on observability properties of VIN.

Fixed-lag smoothing

1. Older states get marginalized out
   Hence, certain properties of Filtering approaches are shared here as well. (accumulation of linearization errors, inconsistency because of marginalization) [18, 22, 26]
2. These are robust to outliers to a certain extent since these can be rejected after optimization.
3. [20 - 24]

Full smoothing

1. Entire history is optimized but becomes computationally infeasible.
2. Only subset of certain frames are kept (keyframes) and the the rest are discarded. [24, 32-34]
3. Typically the optimization is run in a parallel thread. [20, 35]
4. iSAM2 is incremental approach relying on factor-graphs where only those states are updated which are affected by a new measurement.

Use of IMU at high rates

1. Typically it requires that you add states at 1KHz. Just not possible computationally
2. Generate relative motion constraints by integration b/w two keyframes. [24, 30, 38-40]
3. Typically this constraint depends on state at the start of integration requiring to recalculate the integration when the linearization point changes (at every iteration of optimization). [24]
4. Euler angles used in [2] is not invariant under the action of rigid body transformations [41, 42]