Advanced Computer Vision

Chapter 7

Structure From Motion

**Queston1:**

What is mean by *Factorization*? And what is *bundle adjustment*?

**Answer**:

Factorization:

When processing video sequences, we often get extended *feature track* from which it is possible to recover the structure and motion using a process called *factorization.*

Bundle adjustment:

To recover structure from motion the most accurate way is to perform robust nonlinear minimization of the measurement (re-projection) errors, which is known as photogrammetry (in computer vision) communities as *bundle adjustment.*

**Question 2:**

What is the uncertainty and ambiguity with structure from motion?

**Answer:**

Structure from motion involves the estimation of so many highly coupled parameters, often with no known “*ground truth*” components. The estimates produces by structure from motion algorithm can often exhibit large amounts of uncertainty. A unique coordinate frame and scale for a reconstructed scene cannot be recovered from monocular visual measurements alone. This seven-degrees-of-freedom gauge ambiguity makes it tricky to compute the variance matrix associated with a 3D reconstruction.