Basic matrix operations

Reasons for using a lens

What is depth of field, how do you affect it

Lambertian surface versus specular surface

Characteristics of Rotation matrices

Homogeneous co-ordinates –their use in creating projection matrix

Nothing about thin lens equation

Basic camera projection equations from 3d to 2d

Entire projection matrix - from World co-ordinate to camera co-ordinate frame to camera co-ordinates to pixel co-ordinates

Each step in creating the projection matrix p = K [R | T] P

Camera calibration matrix K, the elements and units

Intrinsic parameters, extrinsic parameters

Linear calibration, non-linear calibration for lens distortion

Orthographic, weak prospective compared to ordinary perpsective

Gaussian Noise and Impulse (Salt and pepper) Noise

Filter, Linear Filter, Non-Linear filter

Linear filter convolution -for removing noise and enhancing edges

Separable, non separable convolutions, complexity

Non-linear filter, median

Edges - possible causes

Edge detection steps - same for all types

Derivates in x, and y and convolution implementations

Canny edge detection - non maxima suppression and hysteresis thresholding

Corners - Harris eigenvalue analysis

Invariance of corners - what does invariance mean and what are the types of invariance

Invariance of Harris and Sift corners, differences

Hough transform (HT) - line parameterization change

Basic algorithm and pseudo-code

Applying to things other than lines

Probabilistic HT, why use it compared to standard HT