

# Geometry Questions

## CameraModel.pdf

1. What are the variables in the camera model? What do the variables in the geometric distortion equations correspond to and how do you apply them ?
2. What are the source of blurredness in images? How can they be fixed?
3. Explain why moving and zooming do not lead to the same image.
4. How does autofocus actually works for film cameras
5. What is the difference between the field of view and the focal length?
6. Explain the interest if weak perspective vs normal perspective. Explain the degenerate cases of the perspective projection.
7. Why do we add one coordiante to have  $(x \ y \ z \ 1)$  in homogenous coordinates ?
8. Explain why the cross-product of the homogeneous coordinates of two points gives the homegenous representation of the line they define. What is the "cross-product of two lines"?

## Stereo.pdf

1. How to choose the size of the window for correlation-based window matching? Why do we want window small enough to have pixels with the same disparity ?
2. Why do we want to solve the correspondance problem? How do you choose the corresponding points ?
3. What is the epipolar constraint used for ? How to find an epipolar line? Can assumptions we make on epipolar problems induce false results?
4. What is SSD? And what is it useful for? Why are the advandages/disadvantages of using SSD over normalized correlation for window matching over the epipolar line?
5. How do you transform a disparity image into a depth image?
6. How to proceed to compute disparity when epipolar lines are not horizontal and at the same y location in both images?
7. What is the difference between 3D TV (no glasses) and 3D cinema (glasses) ?