

# EXERCISES FOR INF3320

## THE GRAPHICS RENDERING PIPELINE

07/09/2011

1. Let  $\mathbf{p} = [5.0, 7.0, 2.0]$  and  $d = 2$  and suppose that we use the usual pinhole camera (nålhullskamera). What are the coordinates of the projected point  $\mathbf{p}'$ ?

Next suppose that we place the film plane in front of the camera. What are the coordinates of the projected point  $\mathbf{p}'$  in this case?

Suppose that the film plane has size 2, specifically that  $[x, y] \in [-1, 1] \times [-1, 1]$  and  $d = 2$ . What is the field-of-view (synsvidden)?

2. Review your knowledge about vectors, points and matrices. What are vectors? What operations are allowed on vectors, what do they mean geometrically and what are their properties? How are points different from vectors? What operations are allowed on points? What are matrices and why are they useful for us?
3. Write a program that draws a white square. Use Vertex Buffer Objects and Vertex Array Objects to manage your geometry.

You can start from the file `ex2-1_white_square.cpp.template`.