Using Procrustes we have

Project (using calibration) 🡪

barycentric coordinate are invariant to rigid transforms

same for \lambda z

little super script c means camera frame

unknown Cj = 🡪 12 unknowns of a homogenous linear system

6 points X\_i with their beycentric coordinates alpha\_j,i give solution for (OPEN GV)

cam

cam --> Procrustes subset of X can be the control point

First Linear method for n >= 6 points

Example pose o f a camera from the image of a known cylinder

projection of any quadric in space (sphere, cylinder, ellipsoid,cone, paraboloid, hyperboloid )

more general form (without projected coordinates , in camera coordinates)

where x is image coordinates

discriminant is

corresponding depth

Find nearest point on cylinder to camera

We see two lines that are not necessarily parallel

Equations of the two lines

cross product gives the vanishing point

(unit vectors)

Find out which direction is the vehicle moving