| *Controller* |
| --- |
| Environment |
| *u = GetU(X_bar_d, X_bar)* |

| *Environment* |
| --- |
| -Controller -CameraParam -Features -CirObs |
| SetController(Controller)<br>SetCirObs(X1_cir_obs)<br>I1_f = World2ImgCord(X1_cam, X1_f)<br>I1_cir_obs = GetCirObsInImg(X1_cam, X1_cir_obs)<br>X1_cam = Img2World(I_f)<br>Animate(t,X)<br>Plot(t,X) |
| *X_bar_dot = Dynamics(t,X_bar)*<br>*I_bar_dot = ImgDynamics(t,I_bar)*<br>*J1,J1_dot = GetJ1(X_cam, X1_f)*<br>*f,g = Getfg(I)*<br>*X_bar_cam = GetXBarCam(X_bar_f)*<br>*X_bar_d = TrajGen(t)* |

| Acronyms |
| --- |
| cir_obs = circular obstacle<br>f = feature<br>cam = camera |

| Notations |
| --- |
| X1 = (x,y,z) cord of 1 pnt<br>X = (x1,y1,z1,..,xn,yn,zn) cord of n pnts<br>X1_bar = (x,y,z,x_dot,y_dot,z_dot)<br>X_bar = (x1,y1,..,yn_dot,zn_dot)<br>X1_cir_obs = (x1,y1,z1,r1)<br>I1 = (u,v) cord in image space<br>I1_cir_obs = (u1, v1, r1)<br>J1 : X1 -> I1<br>J1_dot : X1_dot -> I1_dot<br>J : X -> I<br>J_dot : X_dot -> I_dot |