Preliminaries

Notation Zhang

A 2D point is denoted by m  u; v T . A 3D point is denoted by M  X; Y ; Z T . We use xe to denote the augmented vector by adding 1 as thelast element:me  u; v; 1 T andMf  X; Y ; Z; 1 T . A camera is modeled by the usual pinhole: The relationship between a 3D point M and its image projection m is given by