Abstract

With rapid advances in the field of vision based systems and ever increasing applications that they foster to; it brings along many challenges both in terms of algorithm design and associated hardware. One such widely used gadget is the fisheye camera that is used in myriad of applications in various fields owing to their wide Field of View. However, these lenses introduce distortions when any real-world object gets mapped on to the image plane. The amount of distortion in fish eye images increases while moving radially outward from the image centre. Therefore, the amount of correction to be applied should also vary accordingly based on the pixel location. This paper presents a fast and real-time implementable technique for fisheye correction. The proposed method uses non-linear radial stretching and scaling down of pixels thereafter; both in X and Y dimensions for correction. For real-time implementation of the proposed algorithm, we propose the use of inverse mapping matrix. This enables transformation of computationally extensive equations used for correction into a simple look-up table that can easily be implemented on a FPGA platform.


Index Terms

Computer Science  Image Processing

Keywords

Fisheye Distortion  Field of View (FOV)  radial correction  mapping matrix