



USING EPIPOLAR GEOMETRY APPLYING THE BIT- PLANE ON IMAGES USING MAT LAB

SHAIKH A.J.^{1*}, KURESHI ANIS² AND MANZA R.R.³

¹Dept. of Computer Science, P.S.G.V.P.'s Arts, Commerce and Science College, Shahada, Nandurbar, MS, India.

²Dept. of Computer Science, Arts, Commerce and Science College, Navapur, Nandurbar, MS, India.

³Department of Computer Science, Dr. B.A.M. University, Aurangabad, MS, India.

*Corresponding Author: Email- abdulteli786@gmail.com, sunnykureshi786@gmail.com, manzaramesh@gmail.com

Received: February 21, 2012; Accepted: March 06, 2012

Abstract- In this paper we show some results on Epipolar Geometry applying on various images using MATLAB. The Fundamental matrix is given to the depth information on the images we get the critical view of images that can be transfer in to the Grayscale image in to binary image. Matlab is an ideal tool for simulating digital communication system, its gates easy scripting language and excellent data visualization capabilities. Images breaking them up in to their bit- planes images are collecting their pixel values the grey value of each image of an 8- bit image an 8- bit binary word. The binary image will have only given the two values 0 and 1 and hence the image shows best clarity results is fine. The Epipolar geometry is a key point in computer vision and the fundamental matrix estimation, computer vision and the fundamental matrix estimation is the unique way to compute it.

Key words- Epipolar Geometry, Fundamental Matrix, Matlab and Robust methods etc.

Citation: Shaikh A.J., Kureshi Anis and Manza R.R. (2012) Using Epipolar Geometry Applying the Bit- Plane on Images Using Mat Lab. Advances in Computational Research, ISSN: 0975-3273 & E-ISSN: 0975-9085, Volume 4, Issue 1, pp.-34-37.

Copyright: Copyright©2012 Shaikh A.J., et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Introduction

Epipolar geometry estimates the fundamental matrix have been proposed which can be classified into the linear methods and iterative methods. They deal with bad point localization due to noise in image segmentation and robust techniques that eliminate the outliers due to false matching. Epipolar geometry allows us to clarify what information is needed in order to perform the search for corresponding elements only along image lines.

The practical importance of Epipolar geometry is based on the fact that the Epipolar plane intersects each image in a line called Epipolar line. We are applying bit plane on image and those image can be changed his bit point with the best clear results. Gray-scale image can be transformed into a sequence of binary images by breaking them up into their bit-planes. If we consider the grey value of each image pixel on an 8-bit as an 8-bit binary word, then those the images 0th bit plane consists of the last bit of each grey value. Hence the image has least effect (least significant bit plane). The 7th bit plane consists of the first bit in each value; it is called the most significant bit, and the plane consisting of those

bits. If we take a gray scale image, we start by making it a matrix of type double, this means we can perform arithmetic on the values.

Example:

```
>>c=imread('xyz.jpg');  
>>cd=double(c);
```

We now isolate the bit planes by simply dividing the matrix cd by successive power of 2, throwing away the remainder and seeing if the image bit is 0 or 1. We can apply some mod function on that images and then getting the result of the image with the grey scale.

Comparison of Epipolar lines

Epipolar lines serves as qualitative check of the correctness of our result. Following figures show the method of using Matlab can be comparison to the applying with geometry of the images. The grayscale image will be getting most clarity of picture. We show some example of the quality of the fundamental matrix from the vision of images. The Epipolar lines should be passing exactly

through points corresponding to marked points on the left to right images. Following image is existing original is image. And we are applying bit plane on that image using Matlab. In this paper we have described a new linear method for good estimating Epipolar geometry that has the pleasing stability properties of the Hartley method and yet it is also invariant to equiform transformations of the bit plane images. Furthermore the method can be readily extended to other some images quantities such as homographies.

The Epipolar geometry between two views is essentially the geometry of the intersection of the image planes with the pencil of planes having the baseline as axis (the baseline is the line joining the camera centers). This geometry is usually motivated by considering the search for corresponding points in stereo matching, and we will start from that objective here. Suppose a point X in 3-space is imaged in two views, at x in the first, and x' in the second. What is the relation between the corresponding image points x and x' as shown in figure 8.1 the image points x and x' , space point X , and camera centers are coplanar. Denote this

plane as π clearly, the rays back-projected from x and x' intersect at X , and the rays are coplanar, lying. It is this latter property that is of most significance in searching for a correspondence. Supposing now that we know only x , we may ask how the corresponding point x' is constrained. The plane π is determined by the baseline and the ray defined by x . From above we know that the ray corresponding to the (unknown) point x' lies in π , hence the point x' lies on the line of intersection l' of π with the second image plane. This line l' is the image in the second view of the ray back-projected from x . In terms of a stereo correspondence algorithm the benefit is that the search for the point corresponding to x need not cover the entire image plane but can be restricted to the line l' .

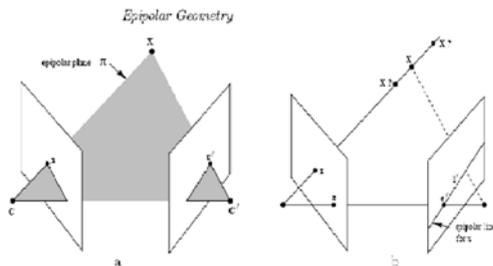


Fig. A- Points Correspondence geometry: (a) the two cameras are indicated by their center C and C' and image planes. The camera centers space point x , and its image x and x' lie in common plane π . (b) an image point x a ray 3-defined by first camera center C and x . This ray is imaged as line l' in the second view. The 3 space point X which projects to x must lie on this ray, so the image of X in the second view must lie on l' .

The image shown in fig. 1. is the colorful then the clarity of points matching is poor. And hence we are converting the image into the grayscale image, because matching point's accuracy is best. We use the fundamental matrix F fits the putative correspondence set X . The estimation of the images we are applying rotation and translation. We compute this fit measure using a robust combination of the images which is approximation of the geometric re-projection error. Some are the individual error of the putative correspondence both the inliers and outliers need to be combined into one overall image results as follows.



Fig. 1- Original Image

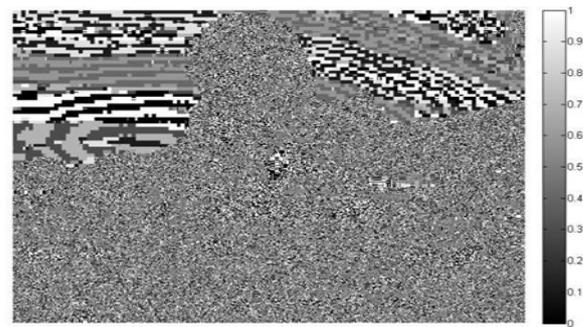


Fig. 2- Applying Bit Plane on original image $\gg c0=\text{mod}(cd, 2)$;

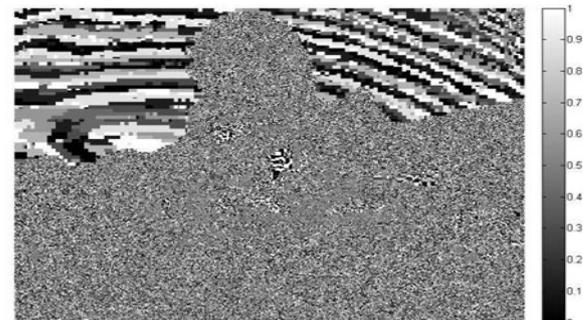


Fig. 3- Applying Bit Plane on original image $\gg c1=\text{mod}(\text{floor}(cd/2), 2)$;

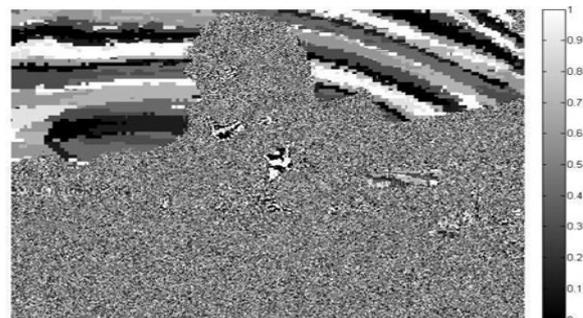


Fig. 4- Applying Bit Plane on original image $\gg c2=\text{mod}(\text{floor}(cd/4), 2)$;

For the applying bit plane on those images the result are coming extremely clear hence we are converting those images into the grayscale image. The image represents an image as a matrix where every element has a value corresponding to how bright and dark at the corresponding position should be colored. There are

two ways to represent the number that re-present the brightness of the pixel.

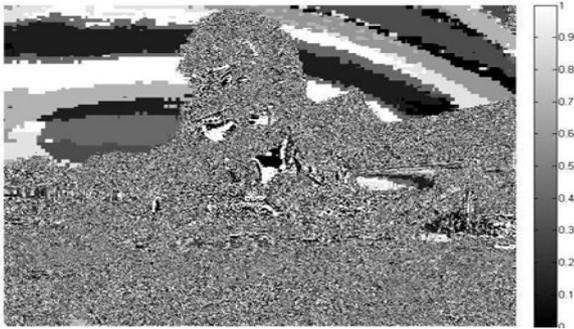


Fig. 5- Applying Bit Plane on original image $\gg c3=\text{mod}(\text{floor}(cd/8), 2)$;



Fig. 6- Applying Bit Plane on original image $\gg c4=\text{mod}(\text{floor}(cd/16), 2)$;



Fig. 7- Applying Bit Plane on original image $\gg c5=\text{mod}(\text{floor}(cd/32), 2)$;



Fig. 8- Applying Bit Plane on original image $\gg c6=\text{mod}(\text{floor}(cd/64), 2)$;



Fig. 9- Applying Bit Plane on original image $\gg c7=\text{mod}(\text{floor}(cd/128), 2)$;

On the left bottom window of fig. 9 we can observe the feature points (crosses) moving from initial towards the bit plane image. We are considering two possible approaches to solve this problem. We would be able to applied directly onto the entities facades assumed to be planner or more complex approaches to solve this problem. For all observation to the applying bit plane on to the images we are get more accuracy for the matching point on to the images. There for exactly matching points are not yet considering we are going to automat matching points on various images.

Conclusion and Future work

The System represented in this paper describes the images re-construct process. It takes only a pair of aerial photos and described system does not require prior knowledge of the real images is the necessary work to design three dimensional models is substantially reduced. Regarding the future work, our objective is to obtain deep information about extracted from the video streams captured in the bus, vehicles, trains etc. Epipolar geometry principle that uses the main detection matching points on those images.

References

- [1] Agarwal S., Snavely N., Simon I., Seitz S. and Szeliski R. (2009) *ICCV*, 72-79.
- [2] Avrithis Y., Kalantidis Y., Toliás G. & Spyrou E. (2010) *ACM Multimedia*, 153-162.
- [3] Snavely N., Seitz S. & Szeliski (2006) *SIGGRAPH06*, 835-846.
- [4] Triggs B. (2001) *ICCV*, 201-208.
- [5] Beardsley P.A., Torr P.H.S. & Zisserman A. (1996) *4th European Conference on Computer Vision*, 683-695.
- [6] Beardsley P.A., Zisserman A. & Murray D.W. (1997) *International Journal of Computer Vision*, 23(3), 235-259.
- [7] Bookstein F. (1979) *Computer Vision, Graphics and Image Processing*, 9, 56-71.
- [8] Brooks M., Agapito L.D., Huynh D. & Baumela L. (1998) *Image and Vision Computing*, 16(14), 989-1002.
- [9] Faugeras O.D. & Hebert M. (1992) *International Journal of Robotics Research*, 5(3), 27-52.
- [10] Zhang W. & Kosecka J. (2006) *3DPVT*, 33-40.
- [11] Piazzini J. & Prattichizzo D. (2003) *IEEE Conference on Intelligent Robots and Systems*.
- [12] Bastos R., Dias J.M.S. (2004) *3rd IEEE and ACM International Symposium on Mixed and Augmented Reality*.
- [13] Nakagawa M., Shibasaki R. & Kagawa Y. (2002) *ISPRS Com-*

mission, IV, WG IV/7.

- [14] Shaikh A.J. & Manza R.R. (2011) *Epipolar Geometry for Stereo Image Processing for good Estimation of the Fundamental Matrix*.
- [15] Wahle A., Oswald H. & Fleck E. (1996) *IEEE Computer Graphics and Applications*, 16, 65-73.
- [16] Lopez A.M., Lloret D., Serrat J. & Villanueva J.J. (2000) *Computer Vision and Image Understanding*, 77, 111-144.
- [17] Daugherty A. (2002) *American Journal of the Medical Sciences*, 323, 3-10.
- [18] Daugherty A. & Rateri D.L. (2005) *Methods*, 36, 129-138.
- [19] Narayanaswamy M., Wright K.C. & Kandarpa K. (2000) *Journal of Vascular and Interventional Radiology*, 11, 5-17.
- [20] Aylward S. & Bullitt E. (2002) *IEEE Trans. Medical Imaging*, 21(2), 61-75.
- [21] Jolly B. Et al. (2003) *Medical Image Computing and Computer-Assisted Intervention, Springer-Verlag*, 953-954.
- [22] Girod B. & Stuhlm K.W. (1998) *IEEE International Conference on Image Process*, 3, 80-83.
- [23] Dong X., Pang Y., Wen J., Wang G., Gao W., Li Y. & Yang S. (2010) *International Conference on Digital Media and Digital Content Management*.
- [24] Barreto J., Martin F. & Horaud R. (2002) *International Symposium on Experimental Robotics*.