



International Journal on Recent Researches In Science, Engineering & Technology

A Journal Established in early 2000 and upgraded to International journal in 2013 and is in existence for the last 10 years. It is run by Retired Professors from NIT, Trichy.
It is an absolutely free (No processing charge No publishing charge etc) Journal Indexed in DIIF and SJIF.

ISSN (Print) : 2347-6729
ISSN (Online) : 2348-3105

Volume 1, Issue 10,
Oct. 2013

Research Paper

Available online at: www.jrrset.com

Chief Editor : 1. Dr. M.Narayana Rao, Rtd. Professor, NIT, Trichy.
(Engg.&Technology division)

2. Dr. N.Sandharani, Ph.D., Professor,
Chennai based Engg.College, (Science division)

DIIF IF :1.46
SJIF IF: 1.329

Development Of An Expert System For Visual Computing The Coordinates Of A Point In Space And Its Applications In Cad/Cam Programming

C.Sivanantham

Abstract: Literature review revealed that numerous methods are available for programming the movements of the work/tool combination for efficient CAM operations. However the methods reported in the literature call for external agency like programmed tape etc for the work/tool system to do the machining operations. The method proposed in this work provides for the systems namely NC/CNC machines to generate their own commands for the various movements of the work-tool combinations. This is achieved by mapping the coordinates of a point in space along the three mutually perpendicular axes using the principles of non linear projection methods like perspective projection methods. Perspective projection method is chosen during the entire work in this project, since the perspective projections closely represent photographic views and the perspective image is simulated through a photographic image. Present work consists of obtaining the photographic image of a 3D environment and the X,Y,Z coordinates of points (Whose actual x,y,z coordinates are known) on the photographic perspective 2D image are measured. Using numerical methods, n^{th} order equations are proposed between the observed X,Y,Z coordinate values and the corresponding known theoretical x,y,z values. The calculated X', Y', Z' values are compared with the theoretical values x,y,z. It has been observed that the percent deviation of X,Y,Z values from the theoretical x y z values is with in plus or minus 10 percent . To further decrease the percent variation, the entire 3D region is segmented and again n^{th} order equations are proposed under region segmentation method. This has brought down the percent deviation to ± 2 . Hence using the proposed n^{th} order equations and using the observed distances from the photographic perspective 2D images the actual coordinates of a point in space can be computed with in an accuracy of $\pm 2\%$. As a future work, the equations can be interfaced to the NC/CNC machine, in order that the machine obtains the image of the environment, process the image and obtain the x,y,z coordinates using the proposed equations. The major contribution of the present work lies in proposing n^{th} order equations between calculated dimensions using numerical methods and the actual dimensions. The percent variations of calculated values from actual/theoretical values is with in $\pm 2\%$. Hence the proposed equations can be used by the machines for self generating the commands.