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A METHOD FOR TRACKING OF ENEMY OR HARMFUL OR UNFRIENDLY OBJECTS IN SPACE AND ON LAND IN REAL TIME

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We know from theory of optics in physics that light deflected from an object forms either an inverted or a real image on the other side of a lens (depending on the fact whether the lens is Concave or Convex etc.). Using the above principal and knowing the focal length of the lens, its refractive index, the angle formed by the object with the lens, one can calculate the distance of the object from the lens and its height. In other words we can calculate the x and y co-ordinate of the object in two dimensional space. But using the same light from the object it is possible to calculate the real distance of the object in 3-dimensional space (using parallax and other techniques), in other words we can calculate the Euclidean distance 'r' of the object in Space or on Land.

But,

$r^2 = x^2 + y^2 + z^2$ ……from 3-dimensional geometry

And x, y and r are known quantities; hence the z-coordinate can be calculated from above equation.

Depending on the data acquisition rate for the values of x, y and r and depending on the speed and accuracy of the calculation of the value z, it is possible to determine (x,y,z) co-ordinates in real-time of a single point from a 3 dimensional object.

Similarly light deflected from other parts of the object will form a 3-dimensional image on a suitable computer. Light from other surrounding environment will show as shaded or a lighter color as there is no deflection of light from the surrounding sources. For a pilot responsible for weapon fire he/she can easily distinguish an enemy or harmful or unfriendly object from its image on the computer screen and the moment of the object in real-time. Therefore it becomes easy for the pilot to lock-in or track the object in real-time with a push of a button or with a touch of his hand on the screen (assuming of course that the image is on a touch screen). Please note the 3-D object detected and visible on the computer screen can be "boxed" and its center of gravity determined from the data points collected using Clustering technique or some other suitable method. The center of gravity for the 3-D object is important as this is point where the weapon has to be fired at for maximum impact and decimation.

Standard ray tracing algorithms can be used in conjunction with above for re-construction of 3 dimensional images if necessary.

Also simulation of the 3 dimensional objects on land/space on a suitable computer could be manipulated using standard algorithms for rotation, dissection, projection etc. which would be useful for visualization and other purposes.