analysis. Such analysis typically takes currently between 2 to 4 minutes to produce a three-dimensional model and with increasing processor speeds an instantaneous or real time application for onsite mapping is possible.

Robotics—automated factory production lines commonly require positional data to locate one component with another. Where this is performed by automated robotic arms a rapid three-dimensional modeling is required to ensure proper location of components. Incorporating a camera into the robotic arms and an associated projection unit the required positional data can be determined in real time;

Security—the present invention has applications in tracking people and objects to monitor their location which includes security applications and monitoring of stock;

Marketing—the present invention also has applications in the recognizing of specific objects e.g. people, and may be applied to monitor the number of people moving through a space or attending a retail outlet and automatically log their movements;

Real time video image modeling—the present invention is also compatible with image capture on a digital video camera wherein a real time three-dimensional video image can be reconstructed.

A further example of the applications of the present invention are illustrated by a further embodiment as follows. The projection of markers into a field of view is not limited to projection of visible light markers but includes markers produced by electromagnetic radiation beams extending throughout the electromagnetic spectrum from 10^{-15} meters to 10^{-6} meters. A particular example is the use of x-ray beams. Here, an x-ray source takes the place of the laser diode and one or more electromagnetic lens means is configured to focus each electromagnetic beam. One or more beam splitters may be included to produce a required number of markers. An origin can be defined by the x-ray source or the lens. Considering the applications in the medical field. Projecting a plurality of electromagnetic beams towards a subject, e.g. a human body, with a back plate of lead, enables x-rays to be reflected from certain tissues through which the x-rays cannot penetrate or are x-ray opaque. Such tissues typically comprise bone. In this embodiment the range of wavelength of electromagnetic radiation being used to produce the markers projected into the field of view must be compatible with the image plate such that the image plate is sensitive to that wavelength of electromagnetic radiation. By projecting a minimum of 2 or 3 x-ray markers, a model of the human body bone structure can be built up. By the use of appropriate radiation sensitive image plate arrays, focusing means and electromagnetic radiation sources, the principles of the present invention can be applied to electromagnetic radiation throughout the electromagnetic spectrum.

Further potential uses of the present invention include thermal imaging using infra-red radiation and long distance mapping by the use of radio waves.

In a further embodiment of the present invention the inventors have understood the limits of utilizing a single imaging device. Any one imaging device has a maximum angle of view which determines the size of field of view. As a result, large fields cannot be captured in a single image. To overcome this problem and to reconstruct detailed three-dimensional positional data of large fields of view it is necessary to take more than one image. This concept is illustrated in FIGS. **26** and **27**.

Referring to FIG. **26**, a first image is captured at position **2601** and a second image is captured at position **2602**. Each of the first and second images include a common reference point **2603**, which may be externally introduced, reconstruction of three-dimensional positional data is as described above. Having produced a three-dimensional data set the common reference point **2603** enables the two reconstructed images to be aligned to provide a model of the combined field of view. This principle can be further expanded by capturing a plurality of images all having at least one common reference point enabling data from those images to be coordinated to produce a single data set for the combined field of view.

FIG. **27** is an optical illustration of FIG. **26** illustrating first camera **2601** and second camera **2602** each capturing images comprising at least one common reference point **2603**. Data obtained from each captured image can be combined to produce a common three-dimensional positional data set to map regions of reflectivity in the combined field of view.

Therefore by having a plurality of imaging devices, e.g. digital cameras or digital video cameras, each camera positioned to capture overlapping fields of view with at least one adjacent camera wherein common reference points can be determined in each overlapping field of view, an area larger than the field of view of a single camera can be mapped. By transmitting information between camera databases, movement of an object in a particular area may be anticipated

The invention claimed is:

1. A method of acquiring an image of a field of view whereby positional data are obtained for at least one region of reflectivity contained in said field of view, said field of view containing a plurality of said regions of reflectivity, said method comprising the steps of:

projecting into said field of view at least two detectable markers, each marker produced by emitting an electromagnetic beam incident on at least one reference plane comprised by said field of view, said reference plane comprising said at least one region of reflectivity, said beams each having an origin;

capturing an image of said field of view on an image plate, said image comprising said markers; and

selecting a set of beam configuration characteristics,

wherein at least one spatial relationship between at least one of the origins of said beams and said image plate at image capture, is determined,

identifying said at least two markers in the captured image; and

using said at least one spatial relationship to determine a set of offset values relating said image plate to said origin; and

using the identification of said markers, said offset values, said selected beam configuration characteristics and trigonometric calculations to determine a set of orientation values describing the orientation of said image plate to each of selected regions of reflectivity in the field of view, said selected regions of reflectivity not being comprised by said reference plane.

2. A method as claimed in claim **1**, wherein said beam configuration characteristics comprise at least one spatial separation between said origins.

3. A method as claimed in claim **1**, wherein said beam configuration characteristics comprise at least one angular separation between beams projected from common or distinct origins.

4. A method as claimed in claim **1**, wherein said beam configuration characteristics comprise at least one spatial