

Glossary#

3-D

three-dimensional, that is reference to a position using all cartesian axes (x, y and z).

3-point perspective

a perspective drawing made with three vanishing points, one for each axis.

Base data

usually used to relate to unmodified photogrammetric data.

CAD

an acronym for computer-aided (assisted) drafting or computer-aided (assisted) design. CAD software is used to design or document physical structures or objects.

Close-range photogrammetry

photogrammetry practised with the aid of computing power, permitting non-stereo photographs from non-rectified cameras to be used to generate fully three-dimensional survey data. Sometimes called desktop photogrammetry. Digital photographs may be used with some programs.

Cross-section

a cut profile taken across the subject.

Database link

a connection between a CAD drawing entity and a record or row in a database.

Desktop photogrammetry

see close-range photogrammetry.

Digital terrain model

a DTM is a digital representation of a three-dimensional surface that is modelled from XYZ coordinates. DTMs are normally used to model landscapes.

Digitise

the process of converting hard-copy line drawings or photographs into a digital format using a digitiser.

Digitiser

a data input device with a tablet and cursor. The tablet has a defined surface and it is possible to relate position on the tablet to position in a coordinate system or even to scale the tablet surface in order to trace drawings.

Digitising tablet

see digitiser

Drawing entity

a CAD model consists of a great many lines, circles, points, surfaces, and so on. Each may be called a drawing entity, providing a convenient term to refer to any piece of a large model without specifying its character.

DXF

drawing exchange format. A file format for the exchange of CAD information. Although the DXF format is public, changes are made to the specifications by Autodesk without consultation.

DWG

AutoCAD's native file format for CAD models.

EDM

an Electronic Distance Measure is a surveying device which transmits and receives an electromagnetic signal to measure distance by comparing the wavelengths of the two signals. Short-range EDMs transmit signals in the visible infrared part of the electromagnetic spectrum.

Elevation

a drawing of the vertical face of a building, wall, or other object. Such a drawing has no three-dimensionality and is simply a plan view of a vertical surface.

Engineering drawing

a drawing consisting of at least three views (front, top, and right side) of an object. Certain conventions are normally used to indicate hidden parts of the object; the point is to specify the object fully with simple plan views of the visible surfaces. Views of other surfaces may be necessary, as may cross-sectional views. Dimensions are normally provided.

File format

the way information is recorded in a computer data file. Specifications of a format permit the file to be written according to a standard and then retrieved for use or alteration.

Hand survey

the collection of information by hand measurement.

Hidden-line view

a three-dimensional model which hides from view lines which would in real-life be obscured by objects in front of them.

Instrument survey

The use of theodolite, EDM, total station etc. to record the location of points and lines in a common coordinate system.

Isometric drawing

a three-dimensional drawing made without the effects of vanishing points or foreshortening. In an isometric drawing parallel lines receding into space remain parallel (rather than appearing to converge as in a perspective drawing), and scale along any individual axis is consistent from foreground to background (rather than diminishing as in a perspective drawing).

Isometric view

a three-dimensional view of an object without foreshortening.

Layer

CAD files normally divide their contents into segments that may be displayed or drawn on command, making it possible to see only specific parts of a model at one time. These data segments are called layers. Layers need not have physical boundaries but may be entirely conceptual.

Migrate

to change data from one file format to another.

Line type

the generation of identifiable line patterns by CAD.

Measured survey

a non-photographic survey, applying draughting skills within a controlled framework.

Metric survey

The acquisition of data by the use of a controlled and repeatable method. It includes measured survey and photogrammetric survey.

Model

a CAD use, a complex representation of some particular physical reality in computer form. The term is used in place of drawing, because many drawings could be created from a CAD model. A three-dimensional model is obviously too complex to be considered a drawing, since changing the point of view changes the drawing. A complex object drawn with multiple layers is also too complex to be considered a single drawing even if it is a simple, two-dimensional representation; changing the visible layers changes the drawing but not the model.

Parametric solid

a geometric model which can be surfaced.

Photogrammetric survey

production of drawings and maps using stereo-photography and survey control.

Photo rectification

process of altering a photograph to change the apparent angle of view. An oblique-angled photograph is rectified when it is altered so that the apparent angle is head-on, and the correct geometric relationships between and among portions of the whole are preserved. (See plane transformation.)

Plot

a generic term used to describe the production of hard-copies from a CAD model.

Pin-bar drafting

drafting on multiple sheets of paper (some of which are transparent) with the use of registration pins to align the paper. Each drawing sheet contains a different portion of the whole, and the pins allow all to be aligned identically. Thus, when combined, the drawings show the full complexity of the object, but they show individual aspects when viewed separately

Pixel

one individual, discrete point on a computer screen, the smallest element of the image made on a screen. (See raster.)

Plane transformation

the mathematical process of translating positions from one plane to another by knowing that certain points in each of the two planes can be matched to one another, making it possible to map all points on one plane to equivalent points on another. (See photo rectification.)

Plotter

a device for making a large paper drawing from a CAD program. Several varieties of plotters are now available. Older models use pens on an armature and moving paper. Newer ones use electrostatic charges or ink-jet technology to put ink on paper.

Raster (image)

images on cathode ray tube devices (televisions or computer monitors) are created by closely spaced scanning lines that consist themselves of closely-spaced dots. Raster refers to the scanning pattern and is used in general to indicate an image made of individual dots rather than lines, circles, arcs, letters, and so on. (See pixel; compare vector.)

Rectified photography

photography taken in such a way, or subsequently corrected, to provide a scaled image of the subject.

Refresh

to write a data file onto new media in order to counter the effects of magnetic decay.

Scale

the ratio between the subject and its representation when plotted.

Scan

to create an electronic image of a paper document or object with a device attached to a computer (a scanner). The electronic image is a raster image.

Scale of tolerance

the ratio between the subject and its representation when plotted.

Sectional elevation

the elevational view seen if a line of cut is taken across part of a building.

Solid model

a model that includes specific information about solid objects, not simply surfaces. Solid models permit realistic views, since surfaces may be included, but they also permit calculations of object weight, centre of gravity, and the like.

Surface model

a model that includes specified surfaces. It is possible to make a realistic view of such a model, since surfaces have been specified, and it is possible to determine which lines (or parts of lines) would be hidden by those surfaces.

Surface normal

the exposed side of a surface. Many programs for rendering are designed to render only the surface that is exposed or visible (any defined surface is actually two surfaces, one faced in one direction and the other faced in the opposite direction 180 degrees away) so as to save the time required to render the invisible surface. The surface normal is the face intended to be seen (and rendered). (Surfaces can be defined by a series of points defining the edge. Viewed from one side, the points will have been entered in a clockwise direction; from the other side they will have been entered in an anti- or counter-clockwise direction. The side showing those points to have been entered in anti- or counter-clockwise direction is considered the surface normal.)

Total station

a surveying device consisting of an electronic theodolite and a coupled electronic distance measuring device. The total station may also include a data recorder for retaining individual measurements (swing angle, angle on inclination, and distance to target). The total station itself will generally be able to calculate point positions, as will the data recorder, but the data recorder is required to store the information and to transfer that information to a computer.

Vector

a mathematical representation of the shape of a line, arc, or circle, indicating coordinate starting point, direction of travel and distance of travel. A vector image is a screen or paper image generated from the mathematical representations of the drawing entities. The scale of the image can be enlarged or reduced to any size desired, and the image will still be correctly shown.

Vectorise

to turn an image consisting only of pixels (a raster image) into an image generated from vectors.

Virtual reality (VR)

a general term used to indicate some form of extremely life-like computer representation. Some would restrict use of the term to computer-generated environments that are immersive; the 'visitor' wears goggles with projected images and is positioned in a room such that he can simulate movement in space. Movement will be reflected in the goggles, and he/she may even have gloves with sensors so that movement of the hands can be reflected in the goggles. Others would broaden the term to include very life-like computer displays that may be manipulated in real time.

Wire-frame

a three-dimensional outline CAD drawing, often the result of an instrument survey. This can be used as an armature or framework.

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