3DEQUALIZER 4
technical specs

Hardware Requirements

Intel compatible CPU (x86/AMD64), multiple cores recommended

minimum 1GB RAM, 4GB recommended

3 button mouse

OpenGL compatible graphics card, NVidia recommended

1280x1024 monitor, dual head HD monitors (1920x1200) recommended

Ethernet card

Operating System Support

Linux 64bit, kernel 2.6.23 (or higher)

Mac OSX 64bit (10.6 or higher)

Windows XP 64bit (or higher)

Linux 32bit, kernel 2.6.11 (or higher)

Mac OSX 32bit (10.5 only)

Windows XP 32bit (or higher)

2D Tracking Engine, Pattern Tracking Mode

forward, backward or forward & backward tracking direction

enhanced tracking mode for greater precision

optional rotation of reference pattern

optional scaling of reference pattern

robust against rapid changes of brightness and/or contrast

rotatable tracking boxes

automatic keyframing based on tracking deviation

2D Tracking Engine, Marker Tracking Mode

forward or backward tracking direction

in situ, sub pixel precise center of mass calculation

rotatable tracking boxes

2D Tracking Engine, Edge/Corner Tracking Mode

forward or backward tracking direction

in situ, sub pixel precise corner detection

rotatable tracking boxes

Autotracking Engine

perspective displacement of tracking patterns

automatic keyframing based on tracking deviation

Autotracking, Primary Pass

forward or backward tracking direction

fast generation & tracking of massive amounts of points per frame

multithreaded

skippable

Autotracking, Secondary Pass

extension of primary pass tracks in opposite direction

multithreaded

skippable

Spline Masks

variable amount of CVs per spline mask

keyframe animation system (movement, toggle visibility state)

joining of multiple spline masks

splitting a spline mask into two separate ones

image masks supported

ImageFile Formats

CINEON, DPX, JPEG, OPENEXR, PNG, RLA, SGI, SOFTIMAGE, TARGA, TIFF, YUV422

Lens Distortion

lens center offset X & Y parameters

3rd party lens distortion plugin interface

standalone image warping tool "Warp4"

custom focus distance parameter

universal python script for exporting dynamic distortion data to NUKE v7 (gridwarp node)

Distortion Model 3DE4 Radial - Standard, Degree 4

6 parameters, compensation of lens element de-centering artifacts

2 parameters, compensation of bending artifacts introduced by beam splitters/stereo rigs

Distortion Model 3DE4 Anamorphic - Standard, Degree 4

10 parameters, x/y direction separated

2 parameters, squeeze x/y

lens rotation parameter

Distortion Model 3DE Classic LD Model

5 parameters, based on 3D-Equalizer V3

Distortion Model 3DE4 Radial - Fisheye, Degree 8

4 parameters

"equisolid angle" fisheye compensation routine

Distortion Model 3DE4 Anamorphic, Degree 6

18 parameters, x/y direction separated

Dynamic Lens Distortion Mode

- dynamic distortion driven by focal length parameter
- distortion parameter animation curves
- dynamic distortion driven by focus distance parameter

Matrix Tool

- grid of multiple matrix points
- basic semi automatic capturing a grid shot's structure
- enhanced semi automatic capturing a grid shot's structure
- proprietary calculation engine
- perspective and planar grid shots supported
- calculation of multiple lens distortion parameters (integrated models only, single gridshot)
- calculation of focal length (perspective grid shots only)
- distortion and focal length determination out of regular footage (classic model only)
- fast & robust calculation of multiple lens distortion parameters (all models, multiple gridshots)
- multithreaded

3D Calculation Core

- very fast and robust, proprietary calculation engine
- frame range calculation
- adaptive end finetuning procedure

- multiple sequence cameras
- multiple reference frame cameras
- individual camera weighting
- variable focal length (zooming)
- zoom curve calculation from scratch
- optimizing imported or edited zoom curves
- variable custom focus distance
- multithreaded zoom curve calculation & optimization
- multithreaded focus curve calculation & optimization

rolling shutter compensation

multiple point groups

a single camera point group for tracking camera movement relative to environment

multiple object point groups for tracking movement of individual objects

multiple mocap point groups for tracking movement of individual points

separate filter function for identifying bad tracking points

Postfilter

smoothing and smoothing-fourier modes

separate z-depth filtering of object point groups

Point Options

survey free, approximately surveyed and exactly surveyed points

calculation of far away points (infinitely distant mode)

automatic calculation of point weights on a frame by frame basis

on-the-fly 2D tracking outlier analysis

user definable point weights

screen position dependent point weight blending

timeline dependent point weight blending

mocap z-depth filtering

Camera Constraints

fixed camera position constraint (nodal camera move)

line movement constraint

plane movement constraint

lock positional channels constraint

permit and allow transformation modes

permit rotations around X axis mode (no banking)

permit rotations around Y axis mode (no panning)

permit rotations around Z axis mode (no roll)

user definable roll angle

Synchronization of multiple Sequence Cameras

a single primary camera per project

multiple secondary cameras per project (witness cameras)

multiple reference frame cameras per project

motion capturing

matchmoving of non-rigid objects

sub-frame timeshift

support for points seen through a mirror

overall motion extraction mode

Stereoscopic

a single primary camera per project

a single secondary cameras per project

multiple reference frame cameras per project

interocular distance, statically calculated or defined by user

dynamically defined by user (interocular distance animation curve)

static vertical shift between primary and secondary camera

static shift along Z axis between primary and secondary camera

multithreaded interocular distance curve calculation & optimization

Parameter Adjustment

simultaneous adjustment of multiple project parameters

fully multithreaded

window embeddable into main window

graphical result browser (one-, two- or three-dimensionally)

detailed configuration of to be optimized deviation

brute force or adaptive adjustment method (per parameter)

adjustable lens parameters: filmback, focal length, film aspect, lens center offset, pixel aspect

adjustable distortion parameters: all			
adjustable camera parameter, sub-frame timeshift (Synchronization)			
adjustable stereoscopic camera parameters: interocular distance, vertical shift, depth shift			
adjustable camera parameter, rolling shutter timeshift			

Python Scripting Interface

comprehensive access to internal data structures			
interactive python console window			
python console window embeddable into main window			
number of individual python commands	265	416	503

Python User Interface Extensions

blocking custom dialog windows			
content-rich non-blocking custom dialog windows			
extending regular menu structures			
adding custom python sub menus			
adding custom python menu entries			
running a python script by selecting a menu entry			
running a python script by typing a keyboard shortcut previously assigned to a menu entry			
adding custom python buttons to display area			
running a python script by clicking a button			
running a python script by typing a keyboard shortcut previously assigned to a button			
integrating scripts into object browser's context menus			

User Customizable Export Filter Scripts

Maya			
Softimage/XSI			
Nuke			
3ds Max			
FBX			

After Effects

Lightwave

Cinema 4D

Houdini

Blender

Image Controls

fully multithreaded, real time adjustment of footage

chroma keying

color curves tool

gamma controls

red, green, blue controls

brightness, contrast controls

saturation controls

blur/sharpen function

user definable presets

window embeddable into main window

Image Buffer Compression

high quality compression of footage

compression ratio of 10:1 or more

allows to hold at least 10 times more frames in memory

multithreaded real time decompression

decompression of 2k footage at up to 60 fps (multithreaded)

sub image decompression for faster frame rates

image buffer compression files

very fast import of compressed footage (up to 100 fps)

Graphical User Interface

user definable environments

Feature			
configuration of multiple sub windows separated by horizontal and vertical panes	●	●	●
user definable keyboard shortcuts	●	●	●
configurable GUI elements (widget size, transparency and brightness)	●	●	●
support for multiple main windows	●	●	●
display multiple reference cameras simultaneously (building survey)	●	●	●
display primary and secondary camera simultaneously (stereoscopic)	●	●	●
display multiple sequence cameras simultaneously (synchronization)	●	●	●
display different views of the same camera (2D tracking, 3D orientation)	●	●	●
user definable first frame number (per camera)	○	○	●
user editable comment (per project)	○	○	●
animate distortion tool	○	○	●

3D Orientation Controls

Feature			
interactive transformation of 3D objects through translate-, scale and rotate manipulators	●	●	●
align scene to global space according to 1, 2 or 3 calculated point objects	●	●	●
import external line geometry / survey (through .obj files)	●	●	●
building up line geometry (geo objects)	●	●	●
create line strip from multiple calculated point objects	●	●	●
create line loop from multiple calculated point objects	●	●	●
create locator from a single calculated point object	●	●	●
export line geometry as .obj file (survey)	●	●	●
hidden line rendering mode	○	●	●
backface culling rendering mode	○	●	●
referencing of .obj file only	○	●	●
realtime rolling shutter removal	○	○	●
realtime undistort footage	○	○	●
constraint-free, unlocked editing mode	○	○	●
generate polygon models out of point clouds	○	○	●
project undistorted, rolling shutter removed footage on to 3D models	○	○	●
up to 3 proxy level-of-detail data sets per 3D model	○	○	●

python script for importing raw lidar scan data

Curve Editor

3D position XYZ curves of current camera / point group

3D rotation XYZ curves of current camera / point group

zooming curve of current Camera

interocular distance curve of current Camera

every lens distortion curve of lens object linked to current camera

multiple instances embeddable into main window

custom focus curve of current Camera

multithreaded zoom curve calculation & optimization

multithreaded focus curve calculation & optimization

multithreaded interocular distance curve calculation & optimization

Lineup Controls

manual controls for aligning a camera to given line geometry (survey)

aligning camera to geometry by dragging special "lineup only" points

extract survey data out of vertices and assign it to point objects

extract survey data out of lines and assign it to point objects

extract survey data out of faces and assign it to point objects

match camera in current frame to tracked Survey Points

move camera in current frame so that survey models become centered

automatic camera consistency, rotate camera, nodal

automatic camera consistency, rotate camera, around virtual target point

automatic camera consistency, rotate camera, around a single, tracked survey point

automatic camera consistency, translate camera, make rotations consistent

automatic camera consistency, translate camera, make rotations and focal length consistent

automatic camera consistency, translate camera, make rotations and translate Z consistent

automatic camera consistency, modify focal length, make rotations consistent

automatic camera consistency, modify focal length, make position and rotations consistent

realtime undistort footage

motionblur rendering

realtime rolling shutter removal

Overview Controls

special anaglyph rendering mode (Stereoscopic)

realtime undistort footage

motionblur rendering

realtime rolling shutter removal

caching rendered frames for realtime playback

save out rendered frame python script

Motiontracking Controls

rotatable tracking boxes

editing 2D tracking curves

overlay grid

Attribute Editor

compact, non-modal editing attributes of entire project
database

embeddable into main window

Object Browser

hierarchical listing of all objects found in project database

multi selection of all objects

adding new objects through context menus

deleting existing objects through context menus

editing of most important object attributes through context
menus

multiple instances embeddable into main window

comprehensive, object type related context menus

integrating python scripts into context menus

Deviation Browser

display average deviation curve of current camera / point group

display deviation curves of individual point objects

display weight curves of individual point objects

multiple instances embeddable into main window

Timeline Editor

schematic view of 2D tracking curves tracked in current camera / point group

comprehensive editing of curve segments

multiple instances embeddable into main window