# Pix4Dmapper 4.3/ FEATURE LIST

| | Features | | Advantages |
|---|---|---|---|
| INPUTS | Aerial —nadir & oblique— and terrestrial imagery | ☁ 🖥 | Process images taken from any angle from, any aerial or terrestrial, manned or unmanned platform |
| | Video (mp4 or avi format) | 🖥 | Automatically extracts still frames from videos to create a project |
| | Any camera (compact, DSLR, thermal, multispectral, fisheye, 360°, large-frame, etc.) images in .jpg or .tiff | ☁ 🖥 | Use images acquired with any camera, from small to large frames, from consumer-grade to highly specialized cameras |
| | Multi-camera support in the same project | ☁ 🖥 | Create a project using images from different cameras and process them together |
| | RTK/PPK + IMU data support | 🖥 | Allows faster and more robust calibration when using the Accurate Geolocation Pipeline |
| | Camera rig support | 🖥 | Process images using known rig relatives from multiple synchronized cameras |
| | Ground control point edit and import | 🖥 | Import and edit ground control points to improve the absolute accuracy of your project |
| | Known or custom reference coordinate system support in imperial or metric units | 🖥 | Select EPSG code from known coordinate systems or define your own local system |
| | Camera exterior orientation support | ☁ 🖥 | Optimize camera exterior orientation parameters starting from GPS and IMU input parameters |
| | External point cloud import | 🖥 | Import point clouds from different sources, such as LiDAR, to generate DSMs & orthomosaics |
| PROCESSING | Processing templates | 🖥 | Automate processing and generation of outputs by using standard or customized templates |
| | Rapid Check with Quality Report | 🖥 | Rapid processing template for a quick dataset-check while still on site |
| | Camera self-calibration | ☁ 🖥 | Optimize internal camera parameters, such as focal length, principal point of autocollimation and lens distortions |
| | Rolling shutter effect correction | 🖥 | Correct the warp of images taken with rolling shutter cameras (like GoPro, DJI Phantoms, etc.) to maintain accuracy, even when flying fast and low. |
| | Automatic Aerial Triangulation (AAT) and Bundle Block Adjustment (BBA) | ☁ 🖥 | Process automatically with or without known camera exterior orientations: (x, y, z, w, f, k) |
| | Automatic point cloud densification | ☁ 🖥 | Produce a dense and detailed 3D point cloud, which can be used as a basis for DSM and 3D mesh |
| | Automatic point cloud filtering & smoothing | ☁ 🖥 | Use presets for point cloud filtering and smoothing options |
| | Machine-learning point cloud classification | 🖥 | Automatically classify the RGB dense point cloud into five groups: ground, road surfaces, high vegetation, buildings and human-made objects |
| | Automatic DTM/DEM extraction | 🖥 | Remove above-ground objects from DSM and create a bare-Earth model |
| | Automatic brightness and color correction | ☁ 🖥 | Compensate automatically for change of brightness, luminosity and color balancing of images |
| | Quality Report | ☁ 🖥 | Assess the accuracy and quality of projects |
| | Project merging and splitting | 🖥 | Combine multiple projects into one or split large projects into several for more efficient processing |
| | Project area definition | 🖥 | Import (.shp) or draw specific areas to faster generate results inside specific boundaries |
| | Custom number of keypoints | 🖥 | Set the number of keypoints to filter noise or speed up processing |
| | Multiprocessor CPU + GPU support | 🖥 | Increase the processing speed by leveraging the power of CPU cores and threads, as well as GPUs |
| | Radiometric processing and calibration | 🖥 | Calibrate and correct the image reflectance, taking the illumination and sensor influence into consideration |
| RAYCLOUD EDITOR | Project visualization | 🖥 | Assess quality of optimized camera positions, 3D point cloud and mesh |
| | Navigation modes | 🖥 | View 3D point cloud and mesh in standard, trackball, or first person viewing modes |
| | Scale Constraint | 🖥 | Accurately scale projects with no or imprecise geolocation by defining one/multiple distances |
| | Orientation Constraint | 🖥 | Orientate projects with no or imprecise geolocation by defining directions of one/multiple axes |
| | Ground control point (GCP ) / Manual tie point (MTP) editing | 🖥 | Annotate and edit 2D and 3D GCPs, check points, and MTPs with the highest accuracy, using both original images and 3D information at the same time |
| | Ellipsoid error visualization | 🖥 | Visually assess the size of the error of the computed position of a GCP or MTP |
| | Project reoptimization | 🖥 | Reoptimize camera positions and/or rematch images based on GCPs & MTPs to improve reconstruction |
| | Image masking | 🖥 | Carve: Remove points from 3D point cloud and create filters based on image content. |
| | | 🖥 | Mask: Clear the unwanted background in orthoplane results. |
| | | 🖥 | Global Mask: Disregard objects that appear in all images, such as a drone leg or a tripod |
| | Point cloud editing | 🖥 | Select, classify or delete points from the point cloud using various selection tools |
| | Orthoplane creation | 🖥 | Define a plane to generate a DSM and orthomosaic from building facades, bridge piles, etc |
| | Polyline and surface object creation | 🖥 | Annotate and measure polylines and surfaces in the point cloud. |
| | | 🖥 | Accurately refine vertexes in multiple original images. |
| | 3D mesh and DSM editing | 🖥 | Annotate & create surfaces in the point cloud to flatten an area or fill up holes in the mesh and DSM |
| | Visual outlier detection | 🖥 | Detect and visualize incorrectly-clicked MTPs (Manual Tie Points)/GCPs (Ground Control Points) |
| | Fly-through animation | 🖥 | Create a virtual camera trajectory, play the animation in real-time and export it |

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| **VOLUME MANAGER** | **Volume object creation** | | Annotate and measure volumes based on the DSM |
| | **Volume object management** | | Import and export selected volume bases in .shp files to enable easy monitoring of stockpiles on site. |
| | **Base adjustment** | | Adjust the reference base to fit different terrain and obtain accurate measurement. |
| **MOSAIC EDITOR** | **Region editing** | | Create and edit regions on the orthomosaic, choose the best content from multiple underlying images and projection type to remove moving objects or artifacts |
| | **Local blending** | | Edit only the desired portion of the orthomosaic, blend it in real-time and get the improved orthomosaic within minutes |
| | **Planar or ortho projection selection** | | Select planar or ortho projection for each created region to remove artifacts |
| **INDEX CALCULATOR** | **Radiometric adjustment interface** | | Make the vegetation indices more reliable and accurate by applying radiometric corrections |
| | **Reflectance map** | | Generate an accurate Reflectance map at the preferred resolution as a basis of index maps |
| | **Multiple region management** | | Improve your analysis by managing and visualizing index values per region |
| | **NDVI map** | | Generate singleband and NDVI maps based on pre-defined formulas without user intervention |
| | **Index formula editing** | | Create and save your own formulas choosing among each input band and generate custom index maps |
| | **Class management** | | Create a basis of your annotated vector map by segmenting the data into classes using statistical algorithms |
| | **Prescription annotation** | | Match on-site scouts and observations by assigning annotations based on your decisions |
| | **Prescription map export** | | Put your data into action and export the prescription map in .shp format |
| **OUTPUT RESULTS** | **2D output results:** | ☁ | Nadir orthomosaics in GeoTIFF output format |
| | | | Orthomosaics from user-defined orthoplane in GeoTIFF output format |
| | | | Google tiles export in .kml and .html output formats |
| | | | Index maps (Thermal, DVI, NDVI, SAVI, etc.) in GeoTIFF and GeoJPG format |
| | | | Prescription maps in .shp format |
| | **2.5D output results:** | ☁ | • Nadir DSMs and DTMs in GeoTIFF format |
| | | | • DSMs from user-defined orthoplane in GeoTIFF output format |
| | **3D output results:** | | • 3D PDF for easy sharing of 3D mesh<br>• Full 3D textured mesh in .obj, .ply, .dxf, and .fbx format<br>• Tiled Level-of-detail (LoD) mesh in osgb and slpk (Esri) format<br>• Point cloud in .las, .laz, .xyz and .ply output format<br>• Classified point cloud in .las and .csv format<br>• Contour lines in .shp, .dxf, .pdf format<br>• User-defined vector objects in .dxf, .shp, .dgn and .kml format |
| | | ☁ | • Full 3D textured mesh in .obj and .fbx format<br>• Point cloud in .las output format<br>• Georeferenced annotations in .csv, GEOjson, and .shp format |
| | **Fly-through animation and flighpaths** | | Export the animation in .mp4 and .avi formats and the fly-through waypoints and path in .csv format |
| | **Optimized camera position, external orientation and internal parameters,** | | Export Aerial Triangulation results into third-party software (e.g. INPHO, Leica LPS, DAT/EM Summit Evolution) |
| | **Undistorted images** | | If the original images were acquired using a perpective lens an undistorted copy of the calibrated images will be generated |
| **COLLABORATION** | **Web share, inspection and visualization** | ☁ | Visualize 2D maps and 3D models using any web browser -mesh & point cloud visualization options- |
| | | ☁ | Measurement of distances, surfaces, and elevation profiles |
| | | ☁ | Inspect and annotate using both original images and 3D information at the same time |
| | | ☁ | Share Projects with annotations via a simple link |
| | | ☁ | Embed project output in a webpage |
| | | ☁ | Real-time shading for digital surface model (DSM) visualization |
| **MULTI-LINGUAL** | **Language Options** | | English, Spanish, Mandarin (zh-CH, zh-TW), Russian, German, French, Japanese, Italian and Korean |
| | | ☁ | English, Japanese |

☁ Cloud platform
Desktop platform



## HARDWARE SPECS

**CPU:** Quad-core or hexa-core Intel i7/ Xeon recommended

**GPU:** Compatible with OpenGL 3.2
2 GB RAM recommended

**HD:** SSD recommended
**RAM:** 16GB - 60GB

**OS:** Windows 8, 10 64 bits
Linux (upon request)

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