RealityCapture

photogrammetry software

POWER | SPEED | ACCURACY

CapturingReality

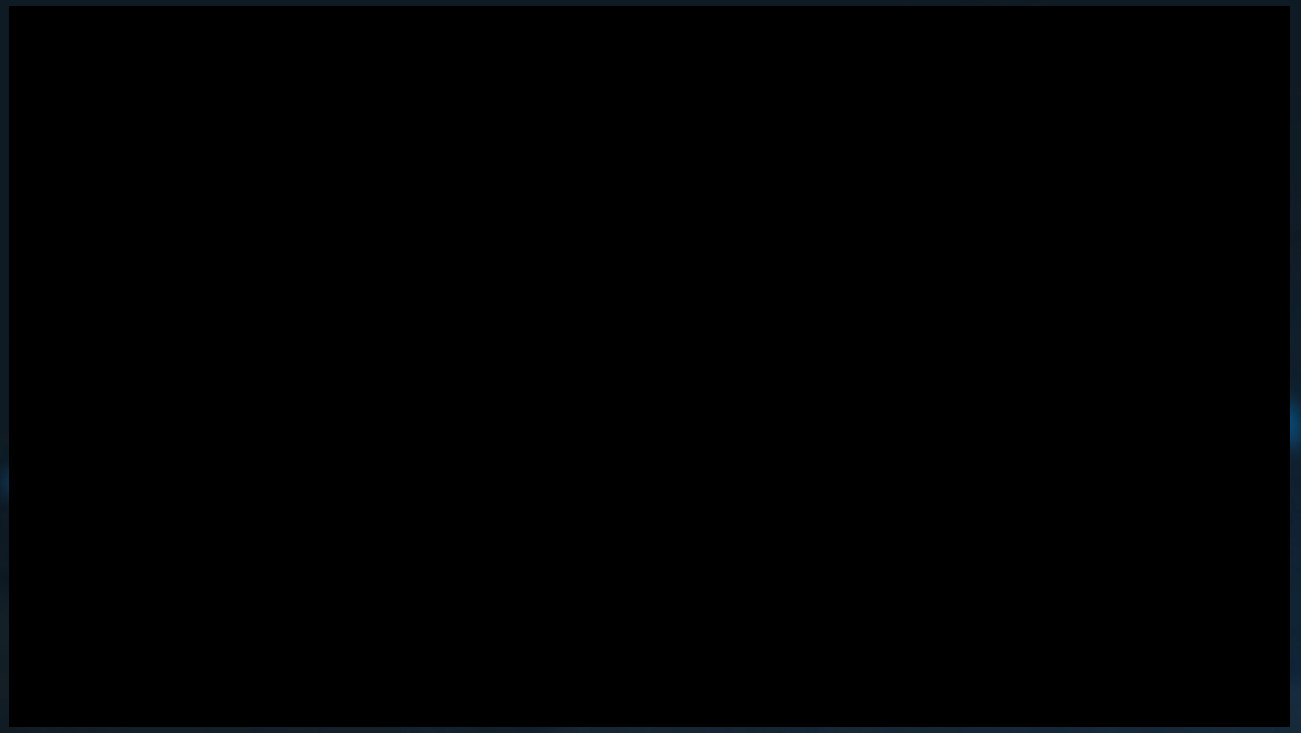
RealityCapture

photogrammetry software

POWER | SPEED | ACCURACY

The most powerful photogrammetry Software

The fastest algorithm on the market with the textures best in detail.
Norwich castle, model created from 1400 images

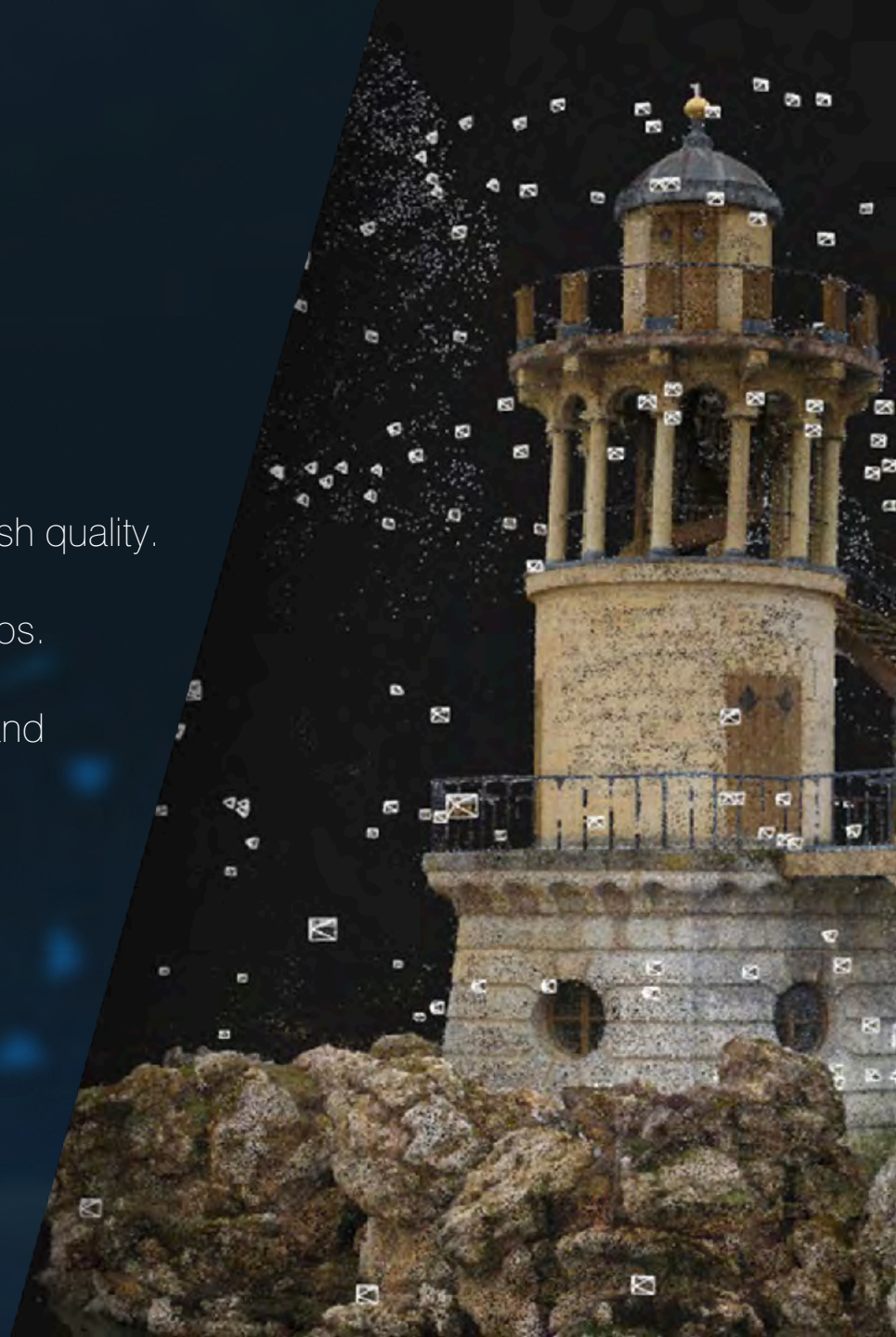


browse through the model here

RealityCapture software

RealityCapture is the state-of-the-art photogrammetry software,
which is currently the fastest solution on the market.

- Outperforms all existing photogrammetry solutions in speed, accuracy, and mesh quality.
- The first software to allow a fully automatic combination of laser scans and photos.
- The only software which is able to mix lasers and photos easily without seams and limitations.



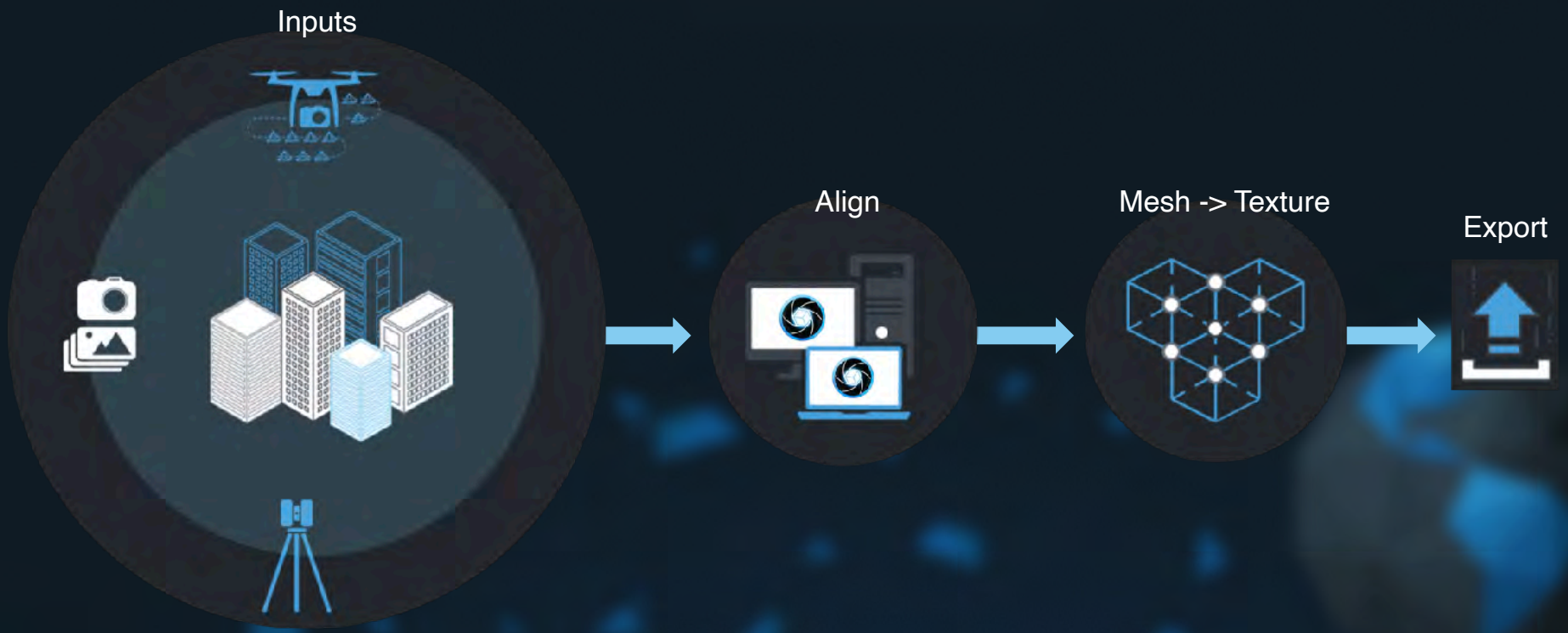
What is photogrammetry?

Multiple photos of the same object are taken from different angles.

The same features seen on images from different angles are used to calculate the position of camera and the 3D shape of the object.

PRODUCT FEATURES

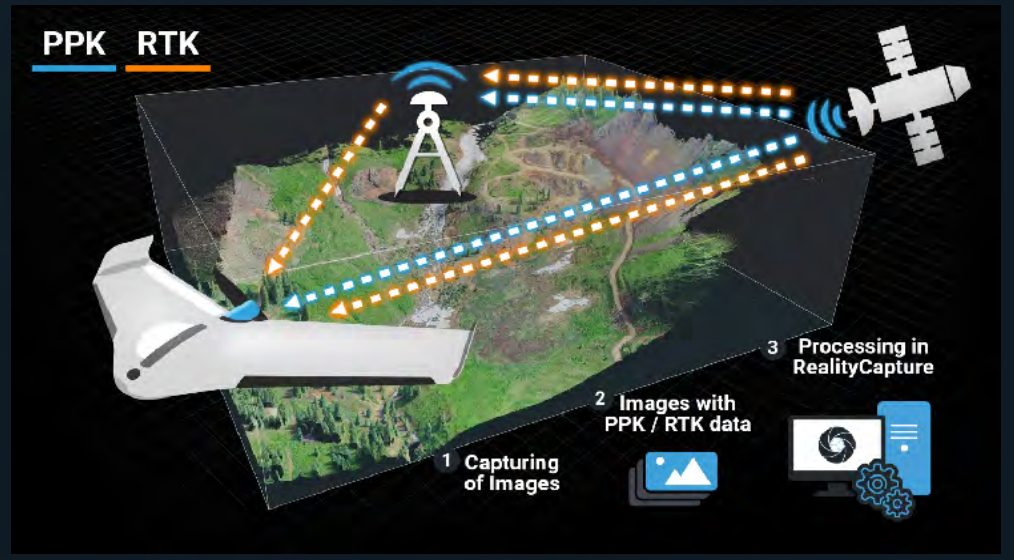
Process

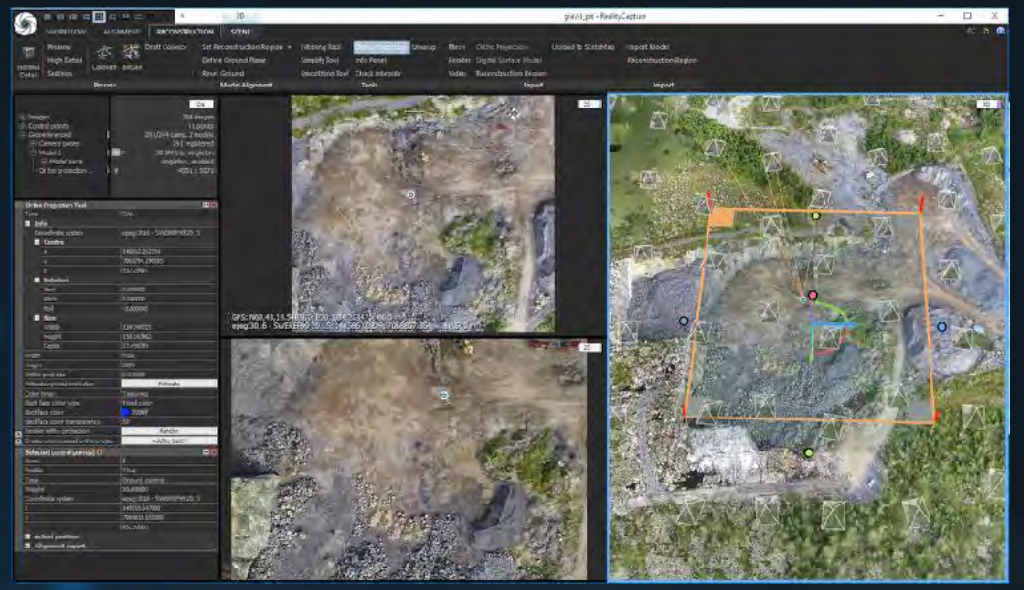


Align- land surveying purposes

Create an accurate geo-referenced point cloud for mapping purposes.

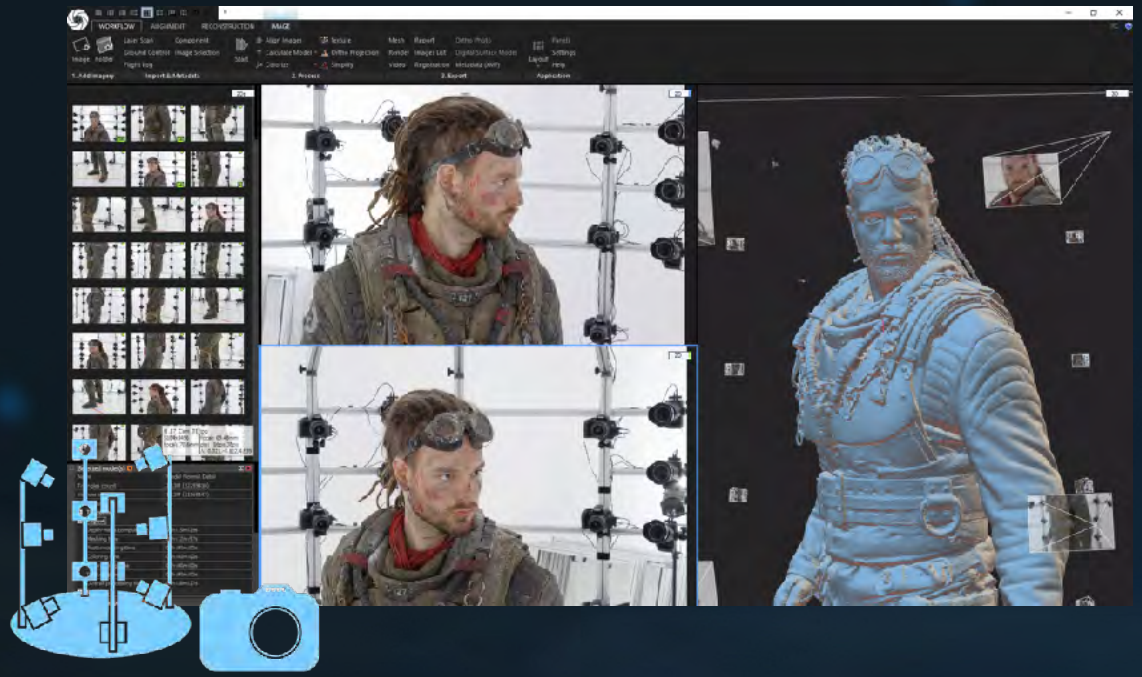
- Aerial photos
- Ground Control Points or PPK flightlog
- Any coordinate system and conversion between them





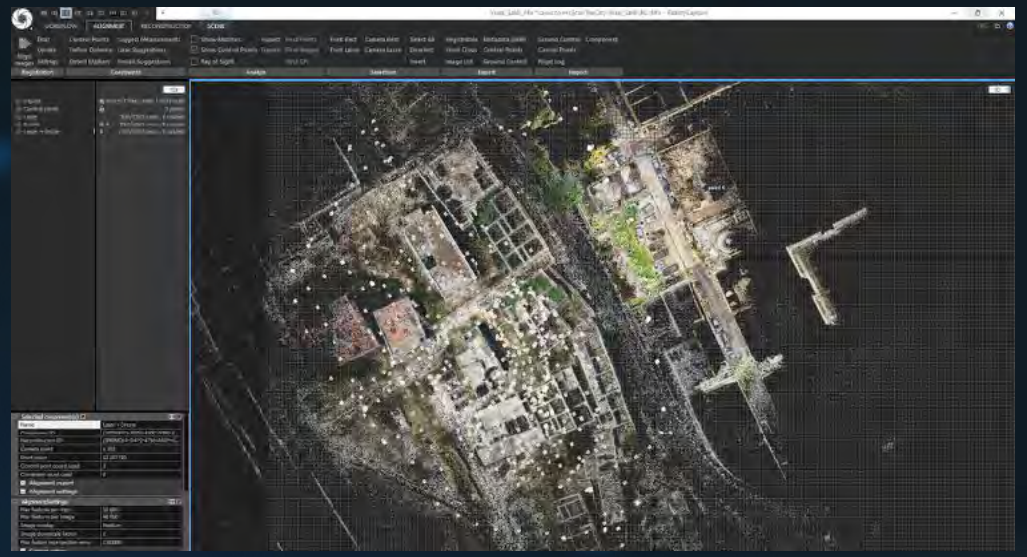
Align- highest quality vfx assets

- Align images in JPG or RAW
- Use camera rigs with registration XMPs and CLI scripting to speed up the process and make it very cost effective.



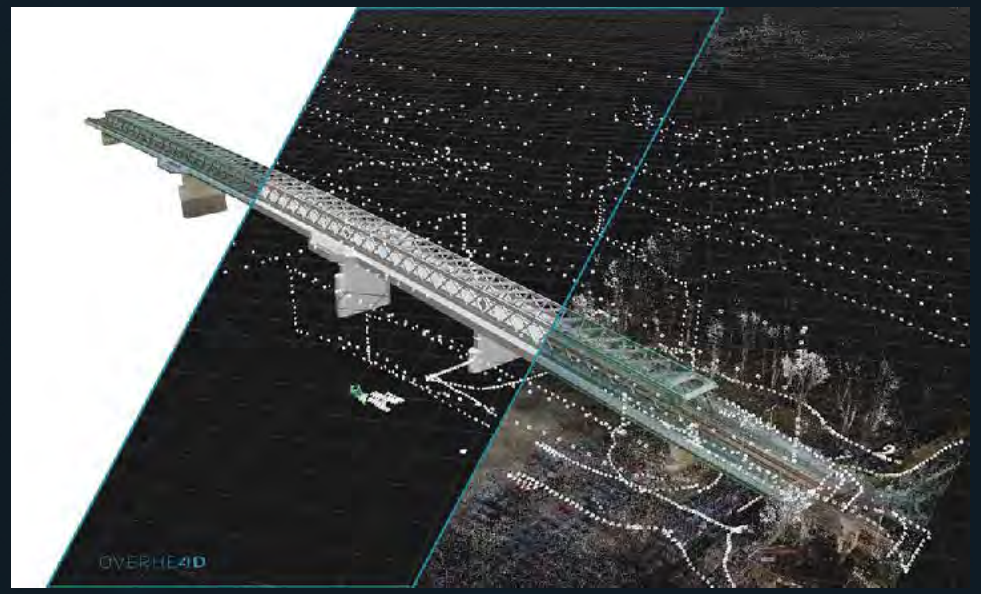
Align - Engineering, Construction, Architecture

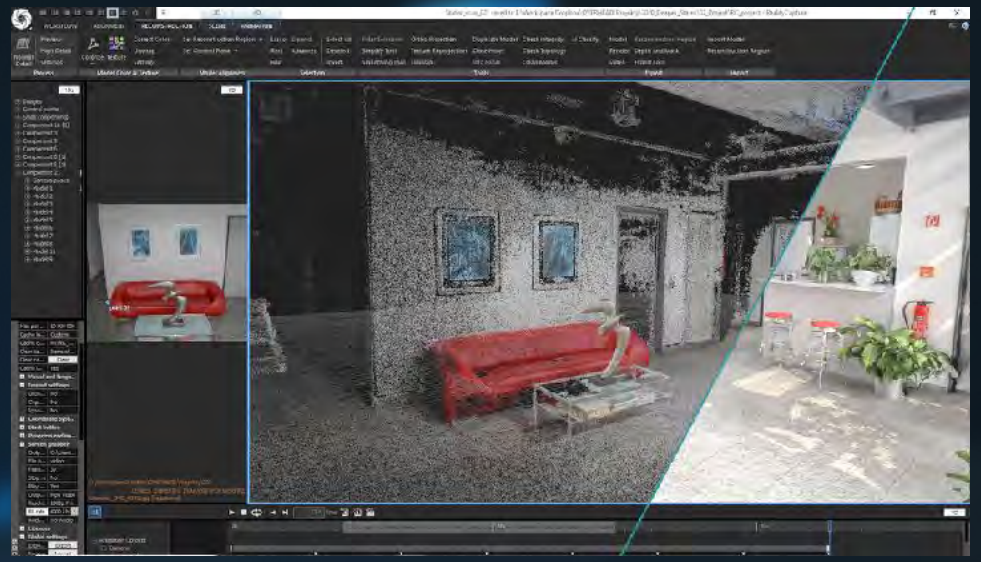
- Create digital twins of buildings or parts.
- Combine data from laser scanners with photos.



Meshing and dense point cloud

- Generation of watertight 3D meshes with custom detail
- Mesh editing tools – simplification, smoothing, closing holes, mesh cleaning
- Tools for checking and repairing model topology



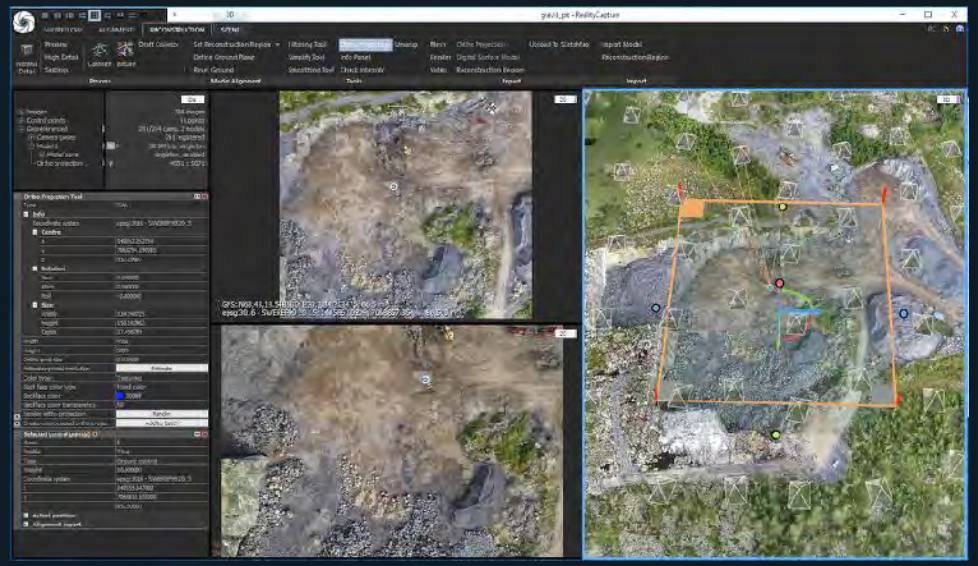


Texturing

- Calculating vertex colors
- Creating UV maps with built-in unwrap tool
- Calculating model textures in UV and UDIMM format
- Re-projecting textures from high poly to low poly model
- Generation of normal and displacement maps

Creation of maps

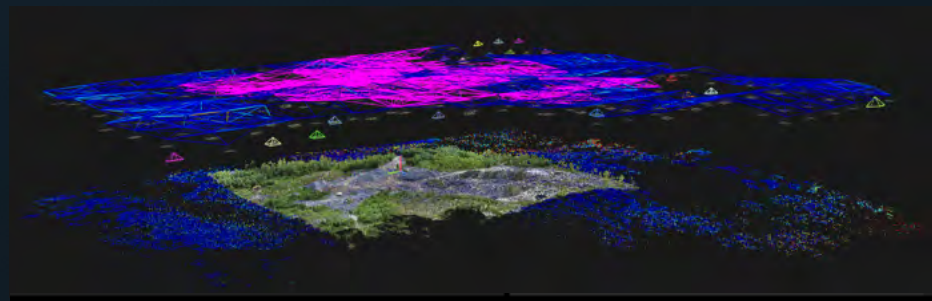
- Creating georeferenced orthographic projections and maps
- Creating side and arbitrary projections
- Generation of DSM and DTM
- Creating sampled projections



Pridat Farebne DSM

Measurements

- Measure distance, area and volume
- Sparse point cloud inspections – camera relations and scene structure uncertainty

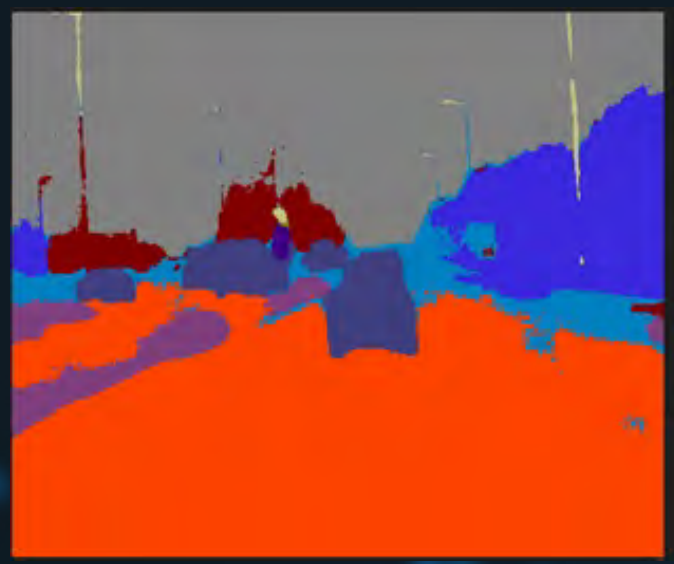


Selected ortho photo(s)

Name	Ortho projection
Width	13 221
Height	14 285
Units per column pixel	0.025645 m
Units per row pixel	0.025646 m
Cut Volume	
Fill Volume	
Area 2D	
Area 3D	
Coordinate syste	

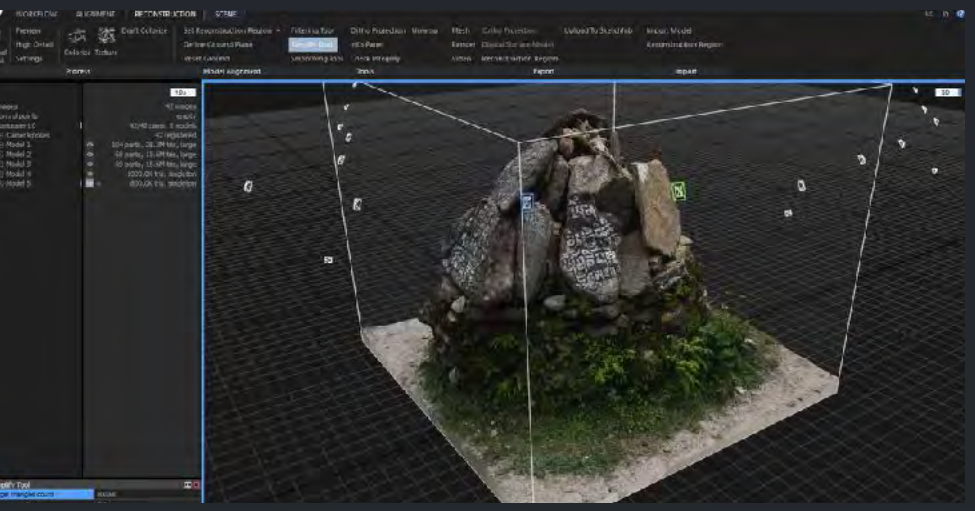
Ai model classification

Import your AI classification of images as a layer and get classified mesh



Realitycapture features

- Automatic 3D model reconstruction of triangular mesh,
- Advanced coloring and texturing algorithms,
- Geo-registration into all world coordinate systems,
- Support for flight logs, GPS in EXIF/XMP, and ground control points,
- Ortho projections, DSM computation, and export into the recognized standards such as tiff, geotiff,
- Volume, area, and distance measurements,
- Creation of geo-referenced maps and digital surface models,
- 3D model export into standard formats (ply, obj, xyz),
- A set of tools for analyzing alignment quality and accuracy, geo-registration, mesh reconstruction, 3D model post-processing (filtration, simplification, smoothing), etc.
- And many more..



INDUSTRY USE CASES

Case Study: Cultural Heritage

Arc/k project - a nonprofit 501(c)(3) organization, digitally archives that which is too valuable, too important, and too unique to be lost or forgotten.

Project: Digitization of historic 2141 train in extreme detail

- The Arc/k Project worked in collaboration with Kamloops Heritage Railway to capture their historic 2141 train in extreme digital detail to preserve it digitally for the heritage railway association and future generations.

- They used around 11 000 images taken with DSLR cameras

"RealityCapture in this project was the only software that we found that could get the level of detail and the quality solve that would allow us to get this project done." Brian Pope, Executive Director/Founder at Arc/k Project

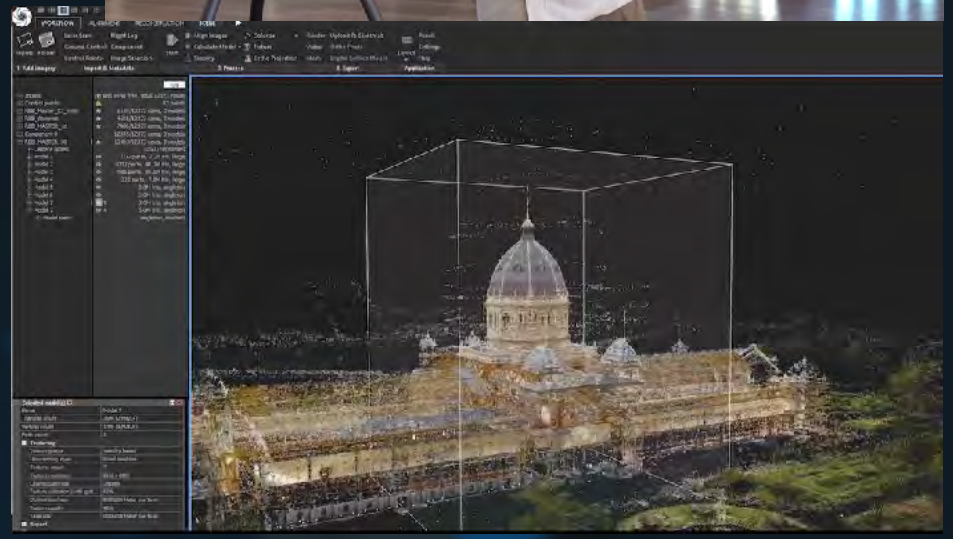
Case Study: Cultural Heritage

CyArk is a non-profit organization based in Oakland, California and the mission is to capture, archive and share the world's cultural heritage.

Project: Digitization of Royal exhibition building in Melbourne, Australia (UNESCO World Heritage Site)

- Creating a digital version of exhibition building in Melbourne that can be easily shared within the community as immersive experience or on the web.
- 2TB worth of raw data, about 10,000 images and 433 scans, which went together into one RC project.
- Laser scanner, drone, ground images

"So RealityCapture is the first software of its kind that is allowing the users to combine laser scanning with photogrammetry and so we can leverage the power and accuracy of the laser and then create meshes from it and on the top of that, create super high resolution textures using photogrammetry. "Valerio Paolucci, Photogrammetry expert at CyArk



Case Study: Cultural Heritage, Archaeology, Surveying

Visualskies is an aerial focused technology company providing photographic and surveying services for film, tv, heritage and construction sectors. We specialise in high definition 3D mapping and virtual reality environments as well as aerial based filming and photography services.

Project: Visualskies Project For National Geographic Series | Lost Cities

- Visualskies has recently completed a project for National Geographic Tv series, Lost Cities. For the first time, 3D scans uncover the truth behind the legend of El Dorado, the origins of Petra and the ancestors of Machu Picchu.
- Terrestrial laser scans + Photogrammetry images (from the ground and from the drone)

"RealityCapture really has completely changed the way that we do thins. Never before have we been able to integrate lidar and images to get the best result from the combination of those two datasets and the things that really impressed us about RealityCapture things like the speed its's much quicker than comparative software, it allows us to process out in the field in real-time, present results rapidly and then augment those results back in the office by swapping out the images and putting in the higher resolution images all within the same workflow" Duncan Lees, Visualskies Ltd

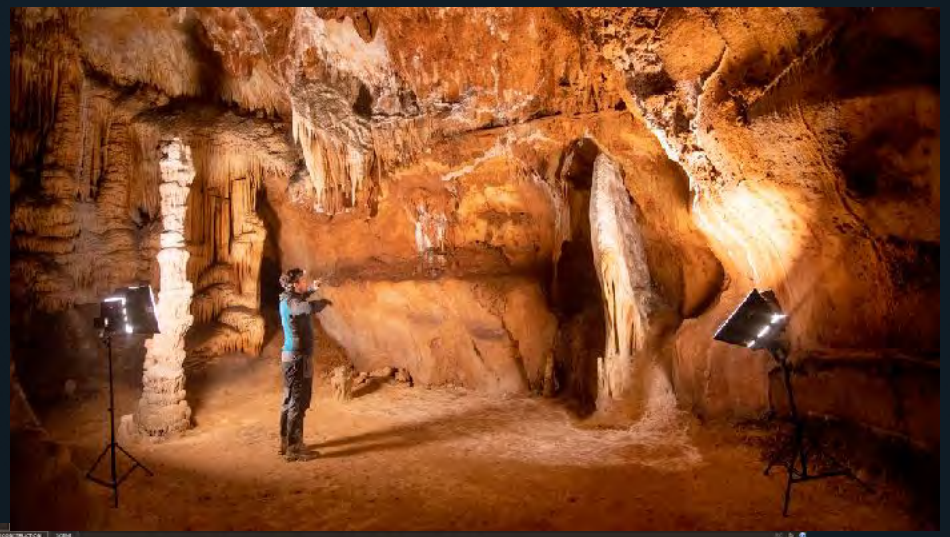
VISUALSKIES

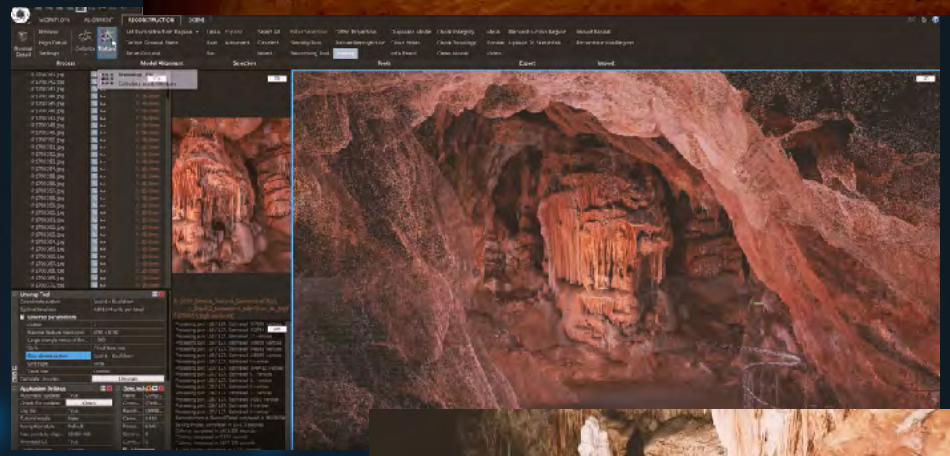
Case Study: Virtual Reality

Overhead4D is an innovative studio focused on creative photogrammetry. The company uses the technology of photogrammetry, laser scanning and drone surveying to turn a terrain or an object into a 3D model with subcentimeter accuracy and bring into virtual reality.

Project: Brining Domica Cave into Virtual Reality

- Scanning pard of Domica cave which is inaccessible to pubic for digital gallery Poliankovo. This 3D model was then later optimized and used as Virutal Reality Experience for visitors of digital gallery Poliankovo.
- Combination of laser scans with photogrammetry + studio lights to capture the cave





"Thanks to the RealityCapture's speed, we were able to check quality of the data directly in the field." Tomas Barnas, CEO at Overhead

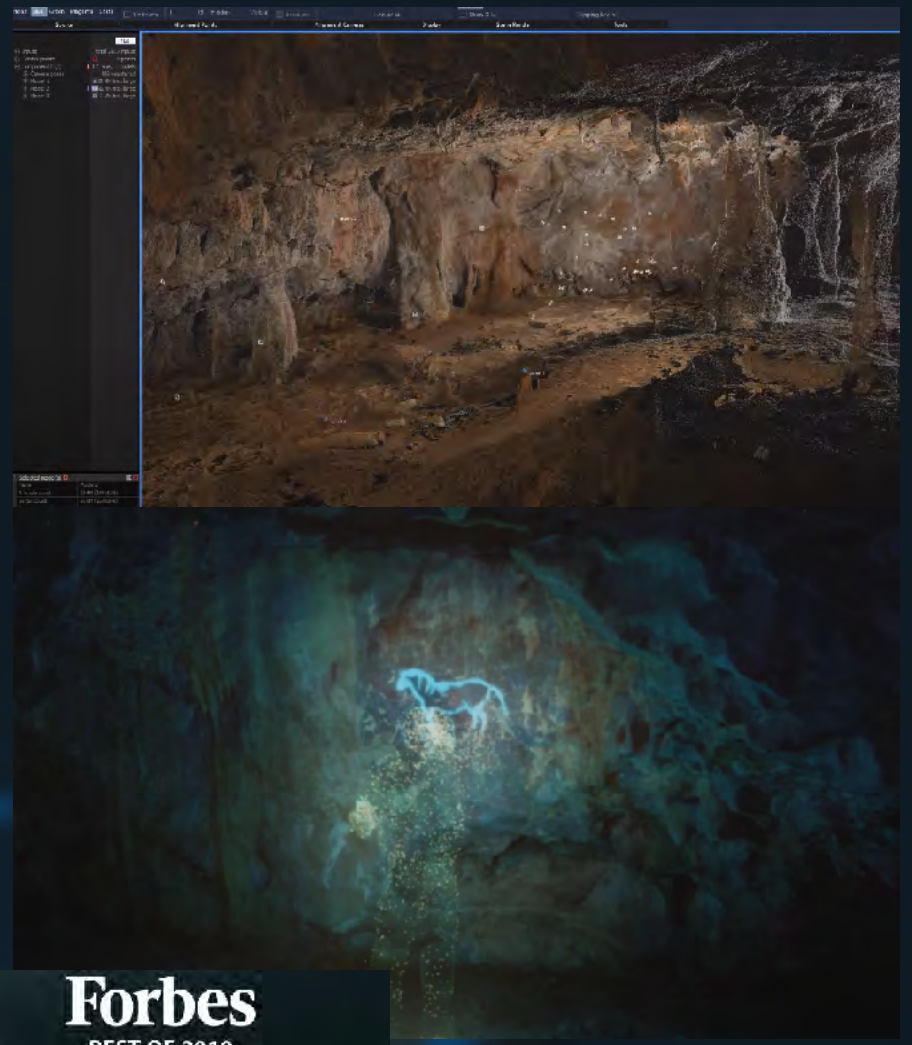
OVERHE4D

Case Study: Virtual Reality

Overlat is an immersive studio focused on interactive experiences formed by professionals who have more than 20 years of experience in diverse fields such as video games, cinema and audiovisual production and responsible of productions like Memoria: Stories of La Garma.

Project: Memoria:Stories of La Garma

- Interactive VR Experience, telling the history of the cave La Garma, inhabited 16 500 years ago.
- The cave was reconstructed by combination of photogrammetry + laser scans
- Interactive object were captured with lightbox, rotating platform and DSLR camera with polarizing filter to remove the reflections from using flash.



Overlat

Forbes
BEST OF 2019

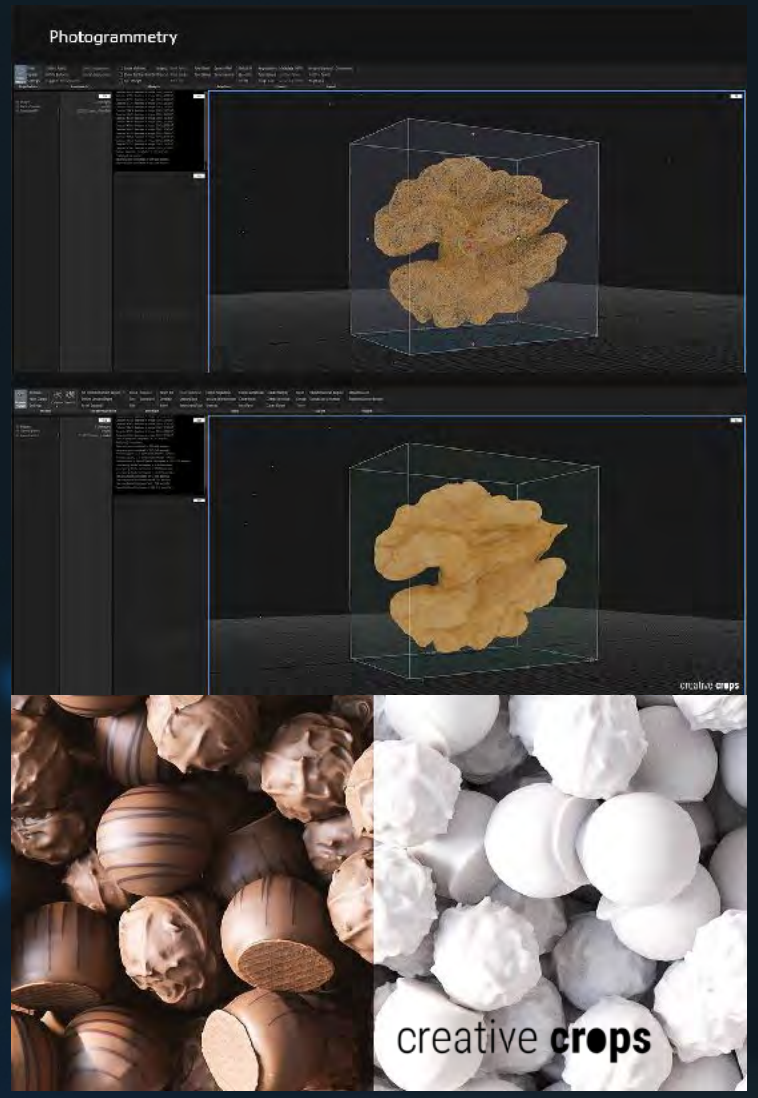
Case Study: Ultra-Realistic 3D Assets

CreativeCrops is a library for high-quality 3D food assets created using photogrammetry.

Project: Ultra-realistic 3D food assets

- Creating ultra-realistic food assets, fruit, vegetables to accompany their online library. These assets could be then bought and used in others' people projects , commercial work. (ArchViz, VFX, games, CGI in general, and even for 3D printing.)
- Around 200-600 photos per scan.

"Right at the start, we were amazed by its speed and level of details. It's great that you can use so many images without the process getting slow. RealityCapture really helped us speed up our process. We immediately fell in love with the software and never went back to the old software again."

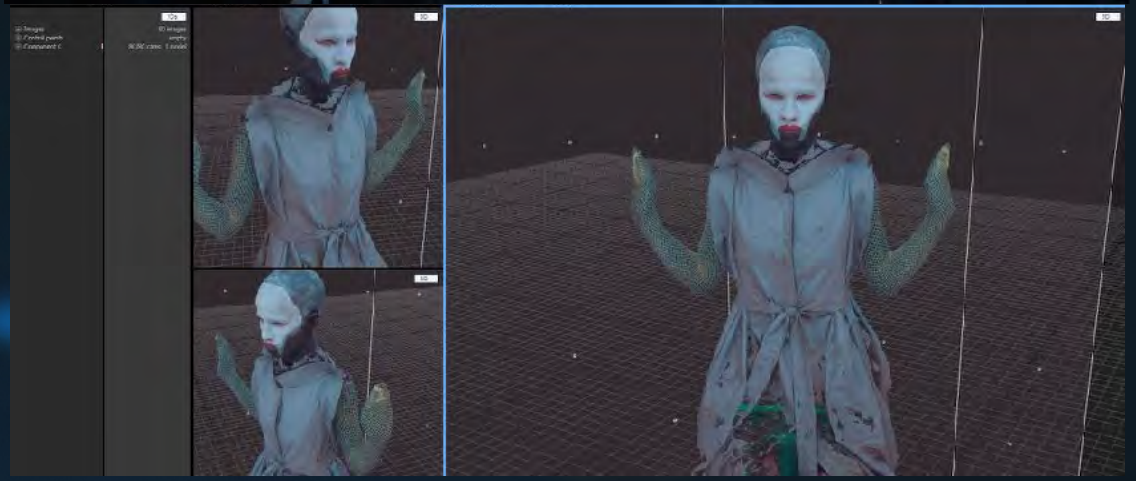


Case Study: Digital Air

Digital Air ,based in Geneva, Switzerland, and New York, USA, develops and produces visual effects and camera array-related technologies. They provide their camera systems as a visual effects production service on film shoots around the world. Digital Air also license, build and install custom camera systems for events and permanent installations.

Project: "Sologrames" in Ghost in the Shell

- special “motion photogrammetry” camera system - a dome that consisting of 80 Point Grey Grasshopper cameras
- the system allows perfect synchronization at 24 fps, each frame consists of 80 images,
- performance of actors has been recorded inside the dome and each frame reconstructred with RealityCapture – post-process created the holograms



“It was a pleasure working with the software and we couldn’t have done the project without it.”
Dayton Taylor, president of Digital Air

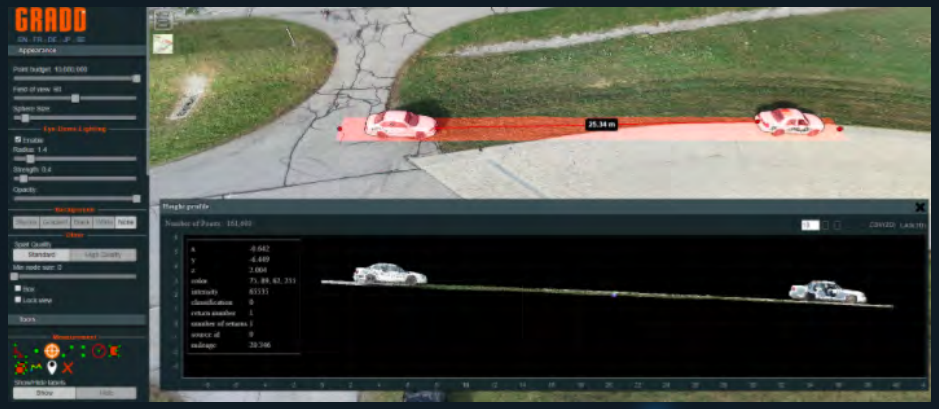
Case Study: Crash Scene investigation

GRADD Provides Integrated Solutions for Accident Reconstruction and Crime Scene 3D Modeling.

Project: Documenting crash scenes in 30 minutes

- law enforcement can verify the integrity of the images and resulting 3D models with the RealityCapture software on a laptop computer, while still at the scene.

“Creating highly detailed 3D models of the vehicles using photogrammetry software digitally preserves the condition of vehicles, just as they were minutes after the crash. This is very important in assisting with the ongoing investigation and the task of accurately reconstructing the accident. And since the RealityCapture software scales linearly, the investigators may capture as many photos as needed and still quickly obtain the final 3D models.” Reza Karamooz of GRADD



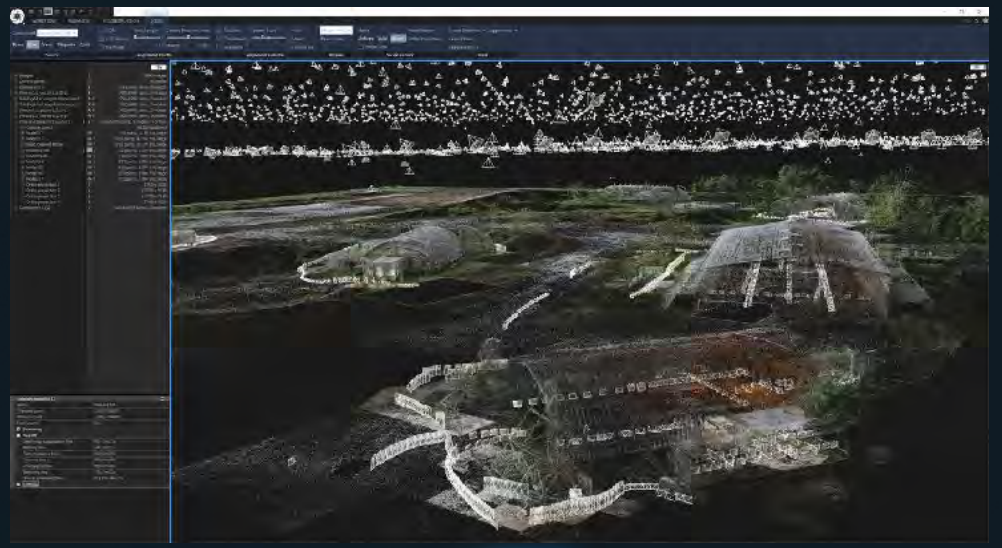
Case Study: 3D Mapping, Event planning

Chasing the Hihat Group is a full-service firm based in Amsterdam, Netherlands. They initiated an internal start-up company that utilizes new technologies such as photogrammetry and Virtual Reality to plan events in 3D, precise dimensioned digital environments.

- Project: 3D maps to help you organize events

- The idea is to scan a natural environment using aerial and ground photographs, use this material to create a 3D map inside RealityCapture and then use it to validate design choices in an event (where to place a different stand, an area for people, where a podium will be…).
- This POV/VR real-scale approach creates higher efficiency in creative teams, compared to using only 2D maps and out of context renders.
- Terrestrial + aerial photogrammetry. 12 000 photos in total.

„RealityCapture helps us recreate real world, massive chunks of land.“



Case Study: Surveying, Inspection

PANORAMA is an interfaculty platform for virtual 3D imagery launched by three laboratories of the Université libre de Bruxelles in Belgium : CReA-Patrimoine (Archaeology lab), AIICe (Architecture lab) and LISA (Laboratory specialized in imagery of the Brussels School of Engineering).

- Project: 3D survey for inspection of historical site by Panorama
- The purpose of the project was to acquire a maximum of spatial data of the 3thrd Cistercian abbey (1198 - France) studied by Professor François Blary (CREA-Patrimoine) to concatenate those data into one complete model to study the architecture and understand the different chronological layers.
- Terrestrial laser scan Faro S350 + aerial photogrammetry
- After reconstruction in high detail by parts, they generated orthophotos for archaeological publications and converted the survey into a dense point cloud working under a modified Potree viewer.
- *“For us, Reality Capture is an everyday tool helping us to work faster and more efficiently on all of our projects.”*

Case Study: Surveying

UAV 365 provide accurate and dynamic drone surveying, inspection and monitoring services across the UK. Using the latest Unmanned Aerial Vehicle equipment to create survey grade 2D maps, 3D models and high-resolution visual data.

- Project: Detailed 3D survey of a large historical building

- Donaldson's school in Edinburgh from 1850 was recently 3D scanned by UAV 365 to provide as-built records for the new residents of the Playfair at Donaldson's.
- Aerial photogrammetry done with DJI Matrice 210 V2 with a Zenmuse X7 sensor equipped with a 24mm lens.
- The surveying took 2 days in total, with the flying drone for 5.5 hours in total. During the first day 90% of the building was captured. RealityCapture gave them a quick preview of the 3D model so they could analyze it and plan the final flight for the second operation.

- *"Use of Reality Capture allowed the stunning architecture and detail of the building to be displayed in high resolution. Combining this high detail with high location accuracy allows for detailed inspection on a technical level." Ben Williams, busines manager at UAV365*

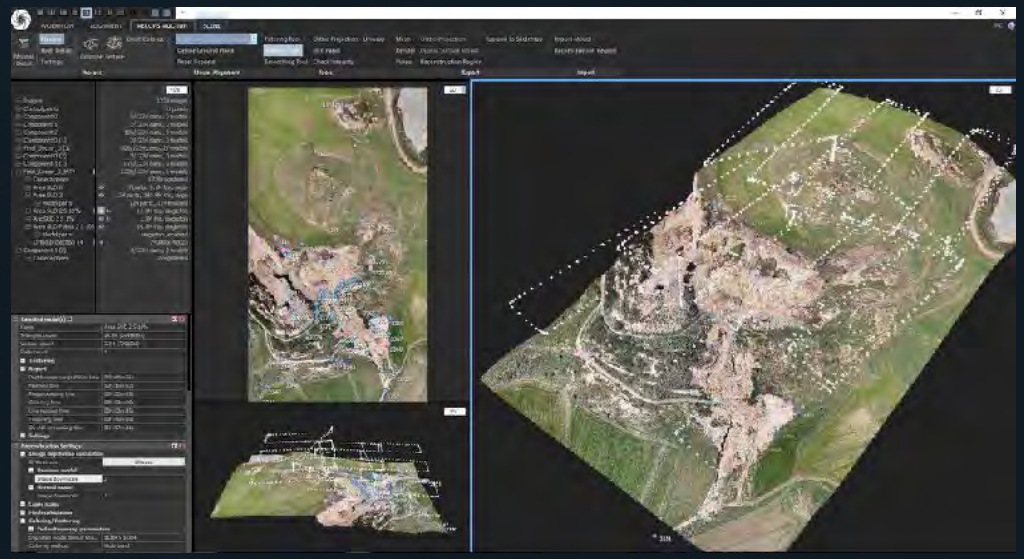
Case Study: Surveying

The Italian National Research Council (CNR) is the largest public research institution in Italy, the only one under the Research Ministry performing multidisciplinary activities.

- Project: RealityCapture and UAS survey

- UAS photogrammetry survey: Landscape assessment of an abandoned quarry in Sardinia, Italy.

- The whole project was based on UAS (unmanned aerial system) survey in order to achieve detailed 3D photogrammetric and BIM models of the abandoned mine. The main focus was on the evaluation of the landscape management degradation which is often very complicated due to the complexity of landforms in open-pit areas. The results of the research project could then be applied to other similar sites.

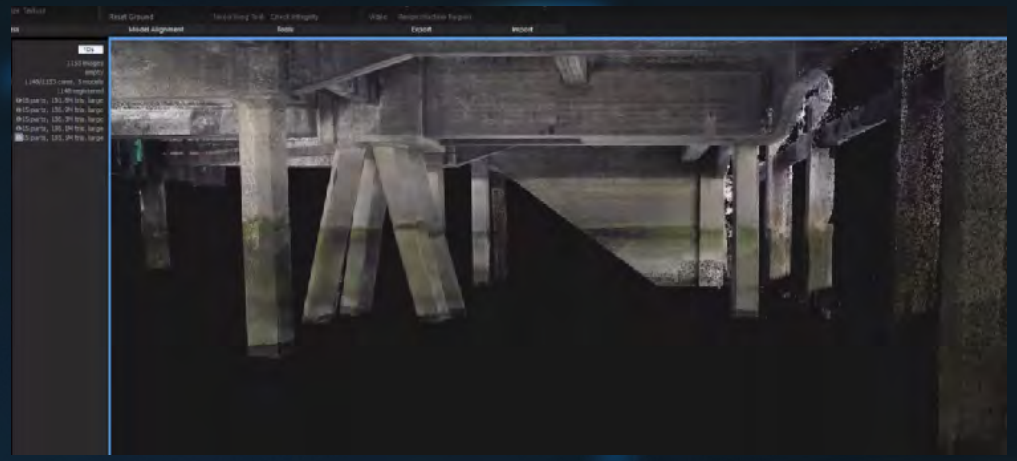


Case Study: Industrial inspection

A Dutch company Ronik Insepctioneering B.V. reduces safety hazard and inspection time with use of drones and RealityCapture

Project: Drone inspection of an industrial jetty

- Use of sailing drone
- 7,000 images have been captured in order to create the 3D model and thus visualize an as-built situation of the jetty.
- Reduction of downtimes



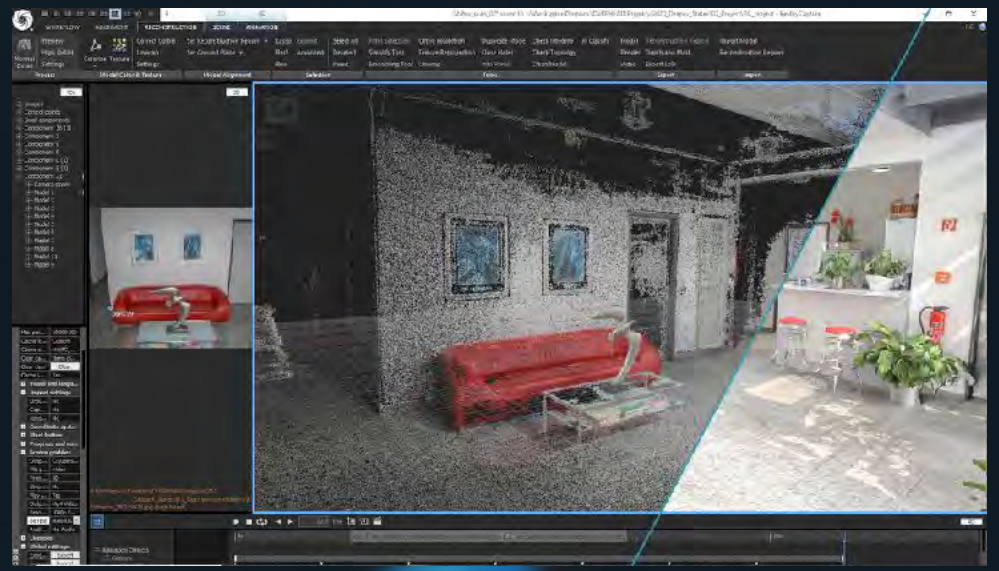
*"*We are big fans of RC. It is fast and it allows us to take many pictures without lots of constraints on where the images have to be taken. It generates fantastic 3D models that we can scale to measured coordinates." Steven Verver, a managing director at Ronik Inspectioneering.

Case Study: Interior Design

Overhead4D is an innovative studio focused on creative photogrammetry. The company uses the technology of photogrammetry, laser scanning and drone surveying to turn a terrain or an object into a 3D model with subcentimeter accuracy and bring into virtual reality.

- Project: Re-designing interior without the need of visiting a location
- The aim of the project was to prepare a 3D visualization of an interior re-design for German company Statex photogrammetry without actually visiting the location. (due to pandemic Covid-19)
- They have provided short online training to the customer on how to capture photos for photogrammetry and all the image capturing was done directly by the client with just a standard camera.

“The great benefit was that even though the photos weren’t captured professionally, RealityCapture created a great model from which we were then able to create the visualization and construction plans. And it was all done without the need to travel. “ Tomas Barnas, CEO at Overhead.



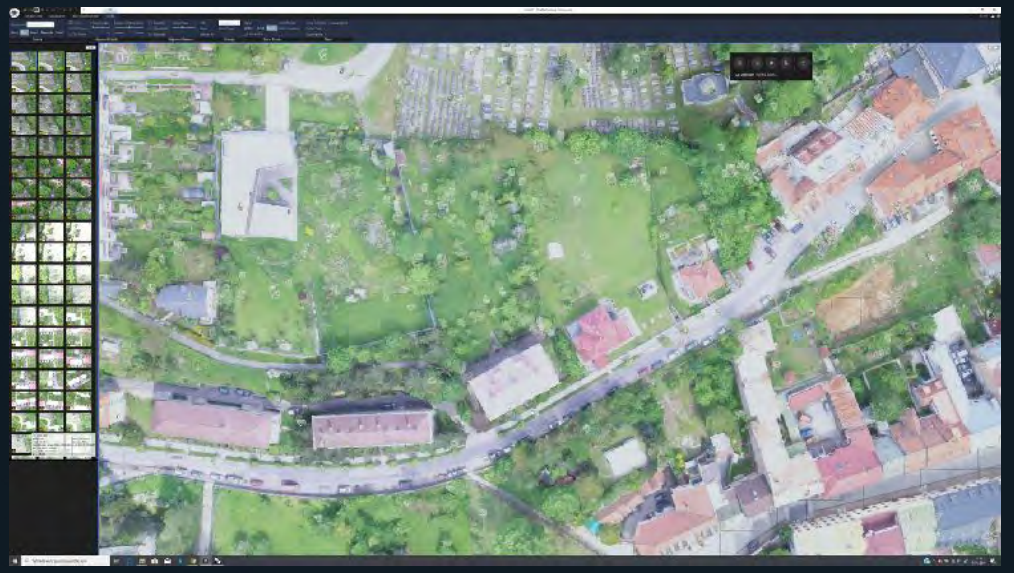
OVERHE4D

Case Study: Architecture

Jakub Moravcik, architect

- Project: Use of photogrammetry in an architectural studio
- Mapping the surrounding with photogrammetry to better understand its terrain and morphology to replace standard more difficult procedure.
- A concept verification in 3D space is becoming almost a necessity.

“We find RealityCapture to be the best program from the field of photogrammetry for application (not just) in architecture, urban design and design so far.”

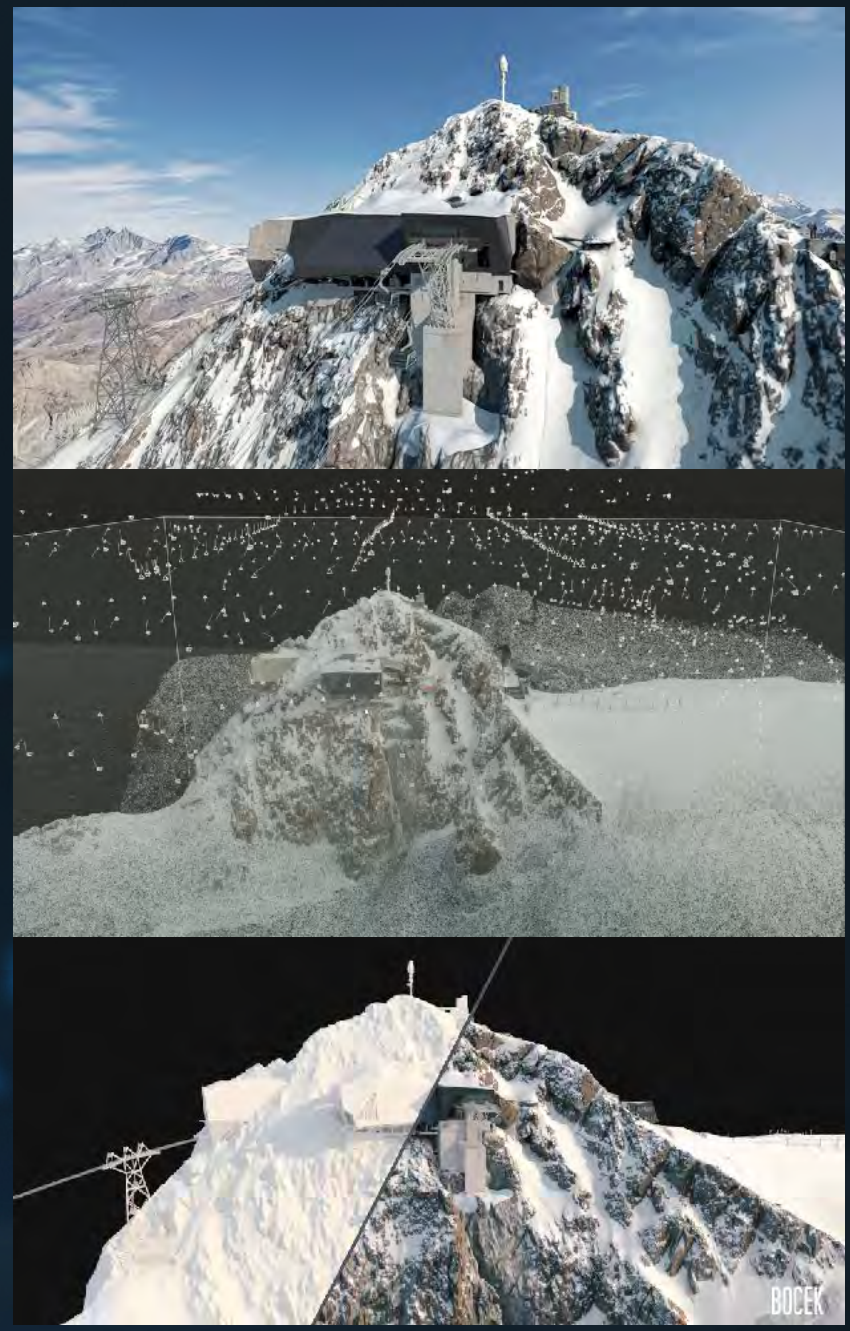


Case Study: 3D Visualization

BOCEK Visual Storytelling is a small studio based in northern Italy (South Tyrol), specializing in product staging. They help clients to explain and showcase the products in order to attain more visibility and to sell better. For this purpose, they are using 3D Visualization, 3D Animation and Film – depending on the needs and goals of the clients.

- Project: Creating 3D visualization of Little Matterhorn ropeway
- Create a visualization of soon to be open ropeway in the Swiss Alps. RealityCapture was used to obtain a realistic 3D model of Klein Matterhorn and Testa Grigia so the project visualization could be set into its real environment.
- Aerial photogrammetry with Dji Inspire 2, equipped with the X5s camera
- This project was done without any previous experience with photogrammetry

"In the past years we started investing more and more time in experimenting with new technologies. We definitely see an interesting future with photogrammetry." Mirko Bocek, Art Director at BOCEK Visual storytelling.



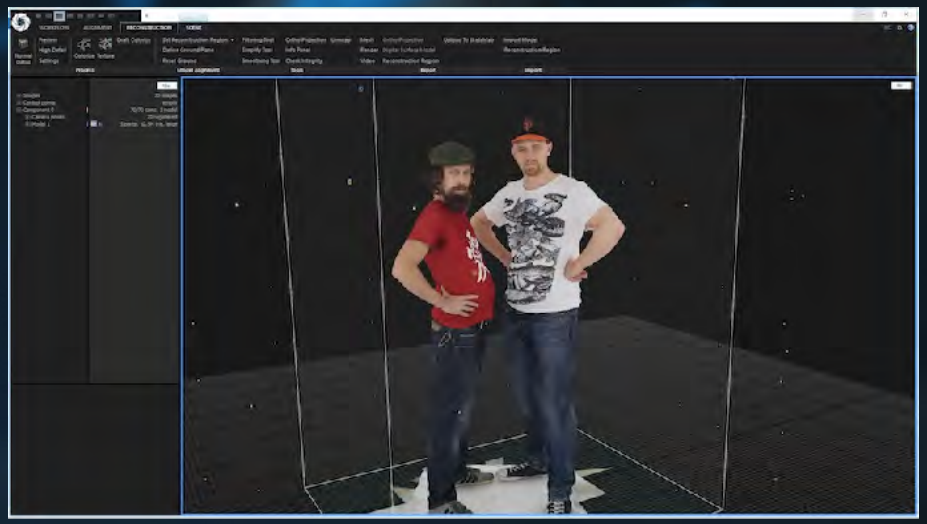
Case Study: Full body Scanning

Botspot is the world leader in photogrammetric 3D technology. Their 3D scanners enable rapid scanning: “One click and 0.01 seconds later you get absolutely precise, standardized 3D data.”

Project: Obtaining photo realistic and accurate digital doubles

- Full body rig with 70 cameras
- Automatization with CLI

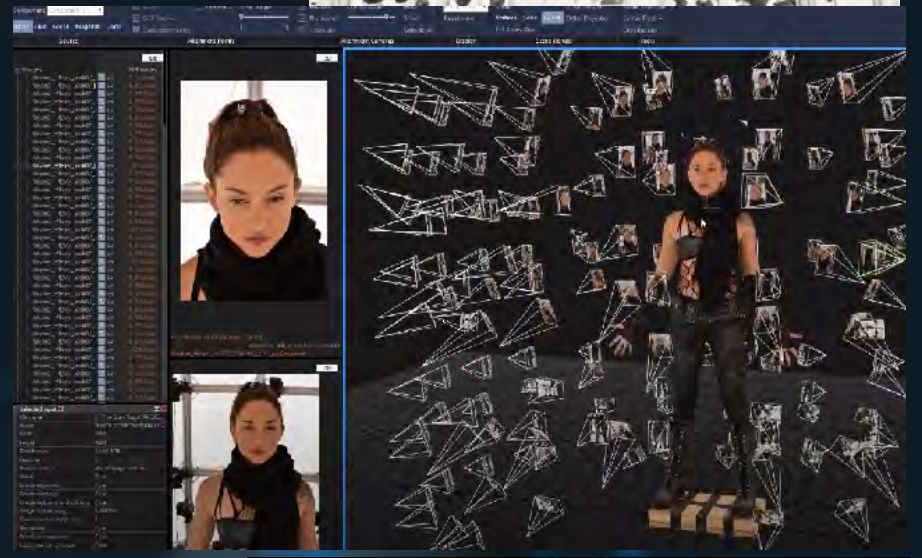
botspot.
3D the world



“RealityCapture is a great tool that allows transforming our scan data into highly precise 3D models. To deal with that big number of 3D scans in our daily business we have applied scripts in RealityCapture to automate the workflow. We really appreciate that! If we would do it like manually it would be very time-consuming.”
Matti Schreyer, Botspot

Case Study: Full body Scanning, Digital Double

The Scan Truck is a mobile photogrammetry studio that offers the most cutting-edge technologies to deliver you the highest quality 3D assets for Films, VR Productions, Video Games, TV, Commercials and more.



Project: Creating digital doubles

- Full body rig with 206 cameras
- The raw scanned data is taken to final retopoligez 3D model that is optimized for game engine and can be used in games, VR and movies.

Licensing & HW requirements

Licensing modes

Pay per use model – PPI

- Price per megapixel of images and per million laser scan points
- Pay for used inputs at the time of exporting the result
- No limit on project size, free trial

Subscription licensing model and perpetual licenses

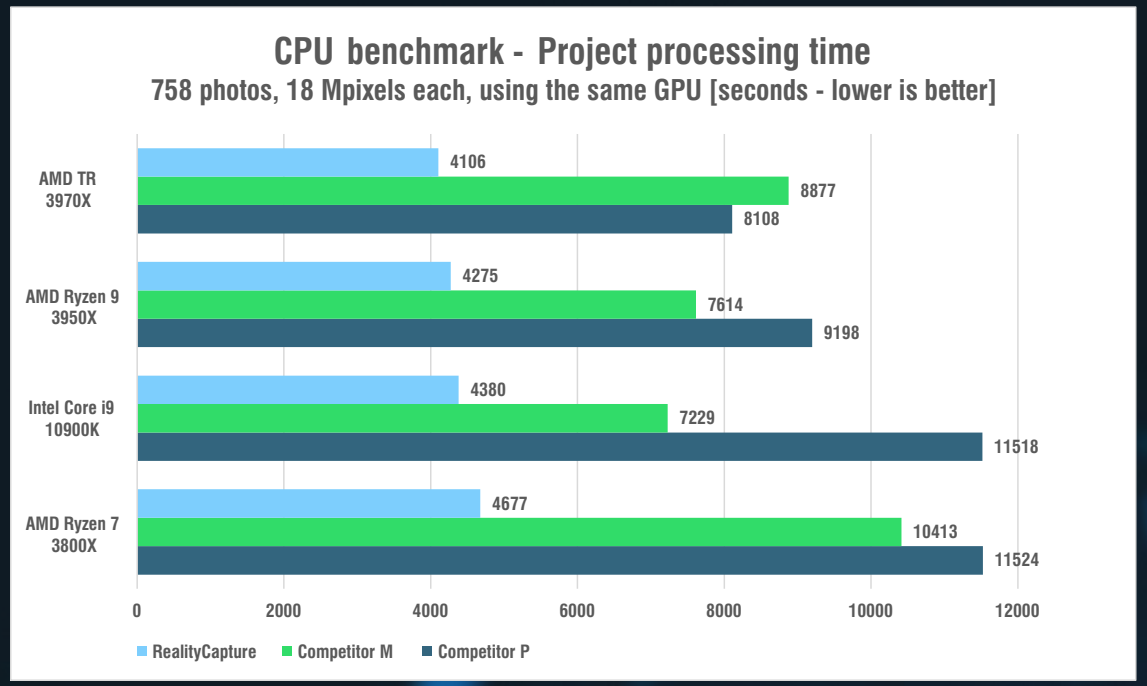
- Monthly and yearly license
- Perpetual license with maintenance program
- Offline activation or license floating in online

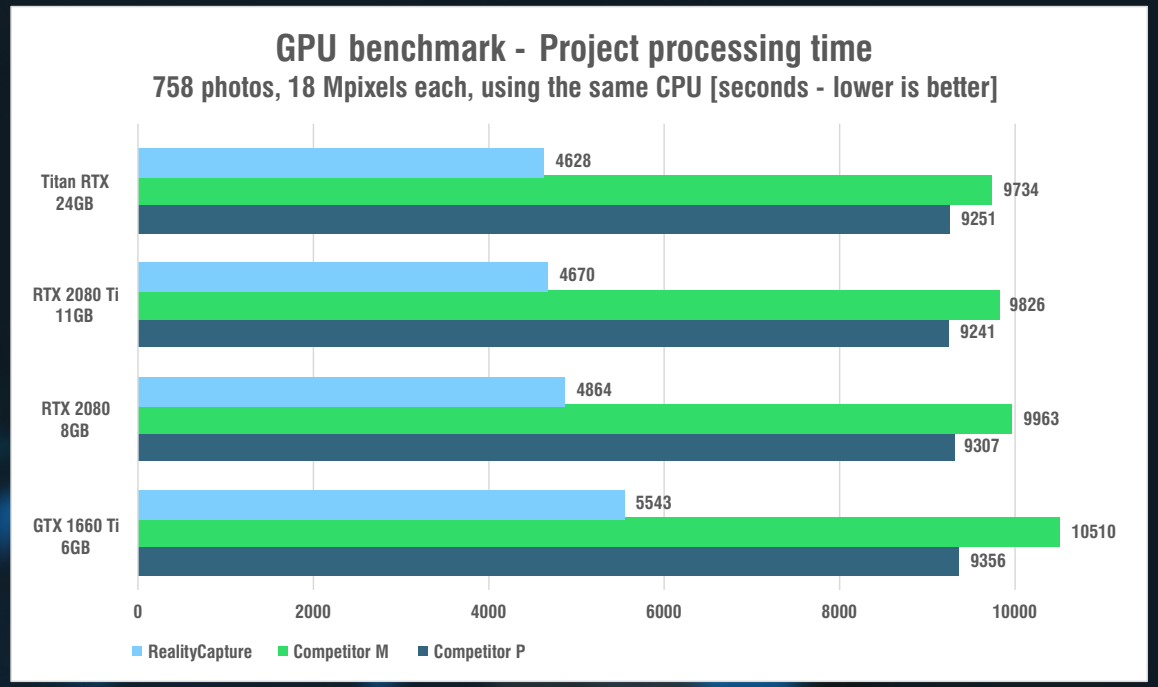
	PGM license	CLI license
Project size	Max 3500 images per project	Not limited
Laser scan processing	Not included	Included
Batch scripting automation	Not included	Included

HW requirements

- Local processing without size limitation, no cloud needed
- 64bit PC with at least 8GB of RAM
- 64bit Microsoft Windows version 7 / 8 / 8.1 / 10 or Windows Server version 2008+
- NVIDIA graphics card with CUDA 2.0+ capabilities and 1GB RAM.
- We recommend using a machine with at least 4 CPU cores, 16GB of RAM and 1024 CUDA cores. If you do not have the NVIDIA card, you will be still able to run the application and register images, you will not be able to create textured mesh.

Benchmarks





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