AS125538-L

ReCap Pro – What's New and Advanced Topics

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Learning Objectives

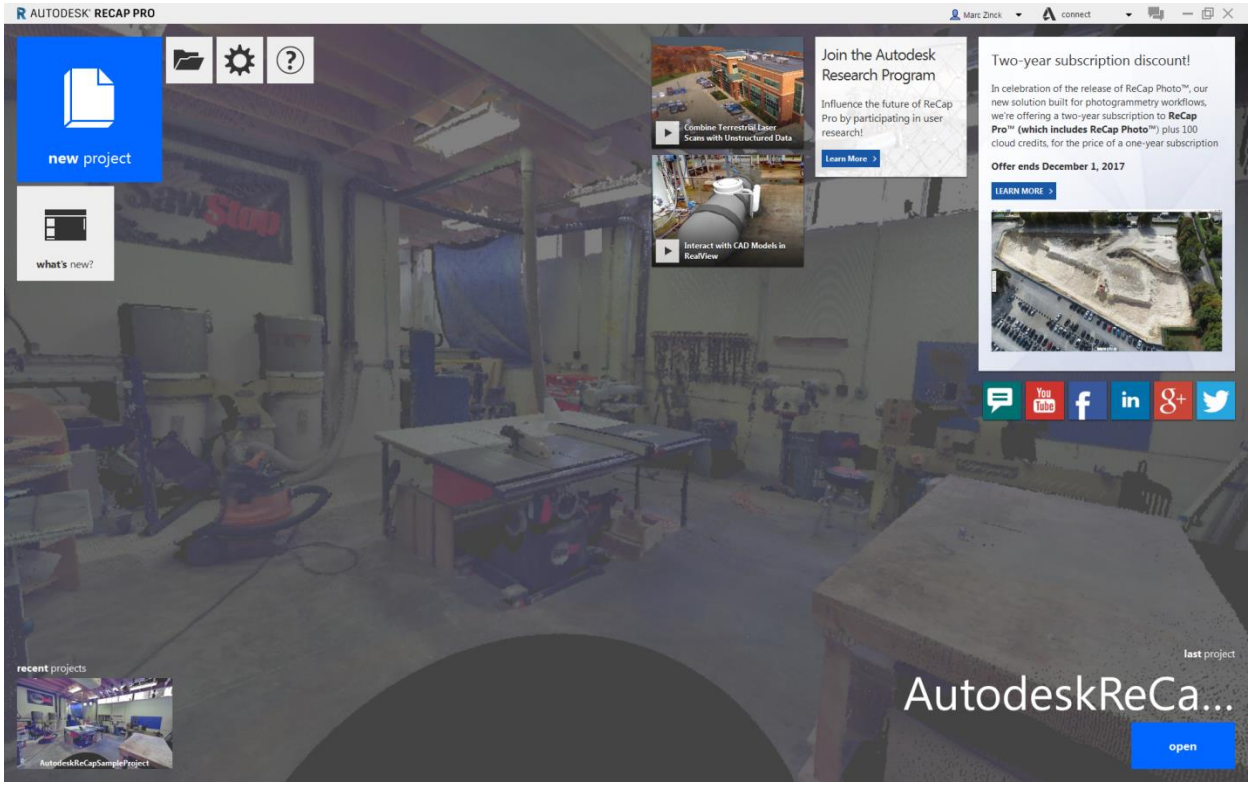
- Understand the new features and existing capabilities of ReCap Pro.
- Learn how to visualize CAD models in photorealistic contexts.
- Learn how to create animations and fly-through movies using ReCap Pro.
- Learn how to become a more efficient and capable user of ReCap Pro

Description

This session will demonstrate the latest developments in ReCap Pro software, focusing on features released since last year (2018 product year). Topics will include attaching Navisworks projects for visualization in RealView, video export, navigation improvements, and collection and processing of scans collected with ReCap Pro for mobile. We will cover new features and workflows in depth and with real-world project data. In addition, we will cover advanced workflow and how-to topics including mesh generation, point cleanup, editing, measurement, visualization modes, regions, and view states.

Speaker

Marc Zinck is a Software Development Manager at Autodesk, Inc. in the Reality Solutions Group leading a team working on the collection, processing, analysis and visualization of captured sensor data. Prior to joining Autodesk, Marc designed, developed and commercialized automated reality capture systems for laser scan workflows. Earlier in his career, as a researcher at the Carnegie Mellon Robotics Institute, he worked on sponsored research projects for DARPA, ARL and NASA building laser based robot navigation and mapping systems for ground and air vehicles. Marc holds a degree in Computer Science from Carnegie Mellon School of Computer Science, has co-authored several peer reviewed publications, is an inventor on patents for geometry synthesis and automated point cloud collection and presents regularly on the topic of reality capture.



RECAP PRO

Exercise #0: Review Data & Backup RCP Files

Review Data Folder Structure

Scan.zip – *Raw Input (not used in Workshop)*
- Scan Files (AU2017000.fls … AU2017016.fls)
- Preview Images

ReCap (Projects Data)
- AU2017.rcp – *Primary Dataset – All Scans (Exercise #1-#11)*
- AU2017 A.rcp – *Sparse Dataset* (0,1,3,5,12,14,7,9) (Exercise #1)
- AU2017 C.rcp – *Small Set for Unified Demo (Exercise #14)*
- AU2017 D.rcp – *Data for Attached Project / Scan to Mesh (Exercise #12 & #13)*
- Support Folders for above
- AU2017 Unified – *Contains a Unified RCS (Exercise #14)*

Targets
- SurveyTargets_A015_A020.txt – *(Exercise #4)*

Models
- Table, Chair, Car (nwd, dwg, …) – *(Exercise #12)*

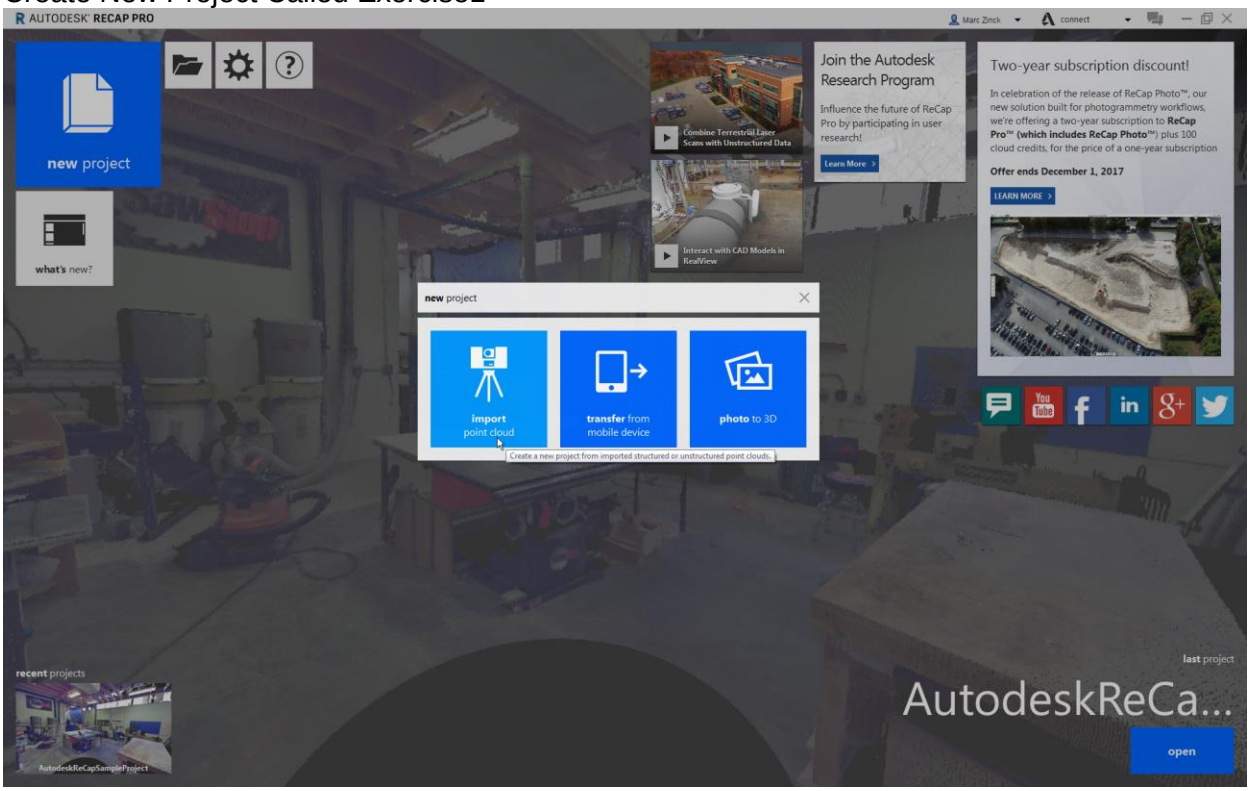
Mesh
- AU2017 D Booth.rcm, obj.zip – *(Exercise #13)*

Back up RCP files

Create a new directory called Backup and copy the RCP files from the ReCap project into that directory. Do not copy the support folders.

Exercise #1: Understanding Registration Metrics

1. Create New Project Called Exercise1



2. Add Scans 10 & 9 from the AU2017 folder by importing the RCS files from the ReCap/AU2017 Support Folder
3. Register Scans 10 and 9 and Review the Registration Metrics
4. Import Scan 8 from ReCap/AU2017 and Register
5. Review Metrics
6. Add Scan 11
7. Review Metrics

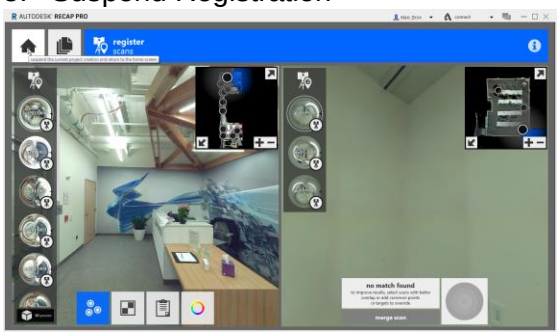
Exercise #2: Confidence in Registration

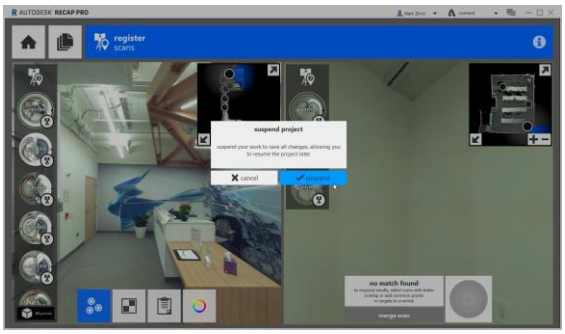
1. Open ReCap/AU2017.rcp
2. Return To Registration
3. Find and Label Targets BXXX
4. Review Target Report

Exercise #3: Resume Registration after Suspend

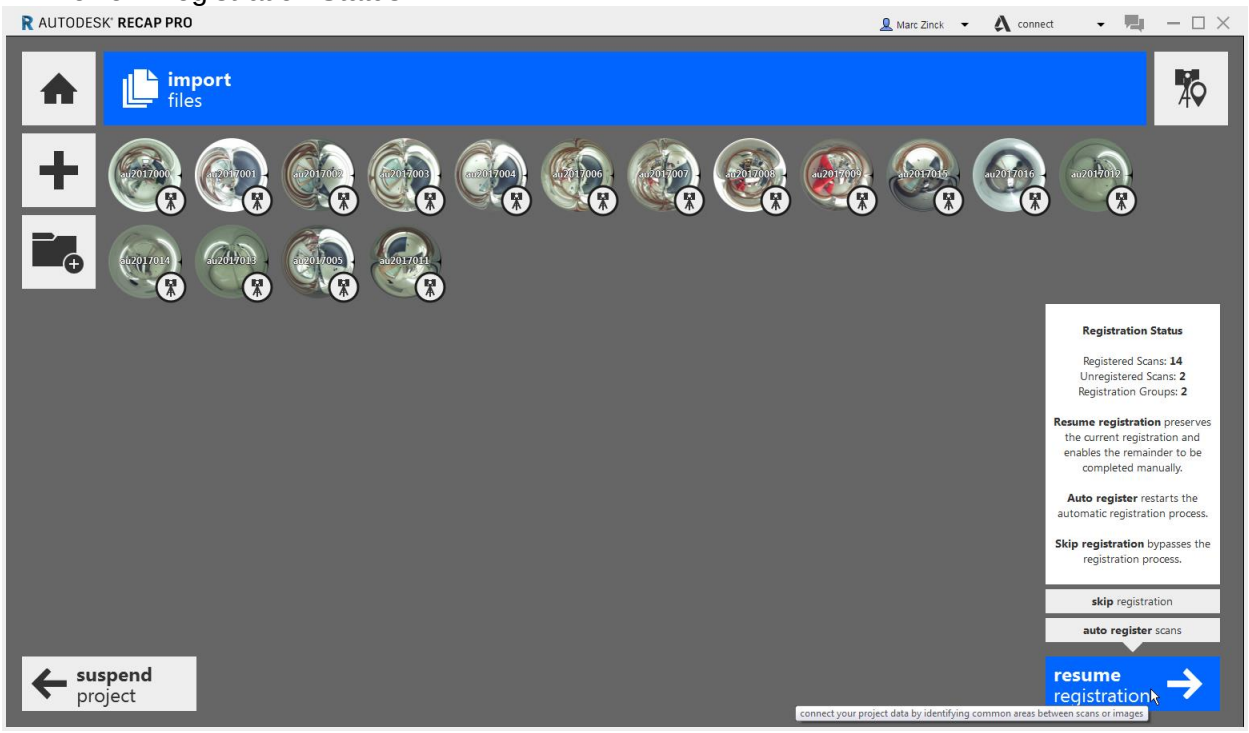
1. Open ReCap/AU2017.rcp
2. Return to Registration
3. Remove Scan 5 from Registration
4. Remove Scan 11 from Registration

5. Suspend Registration

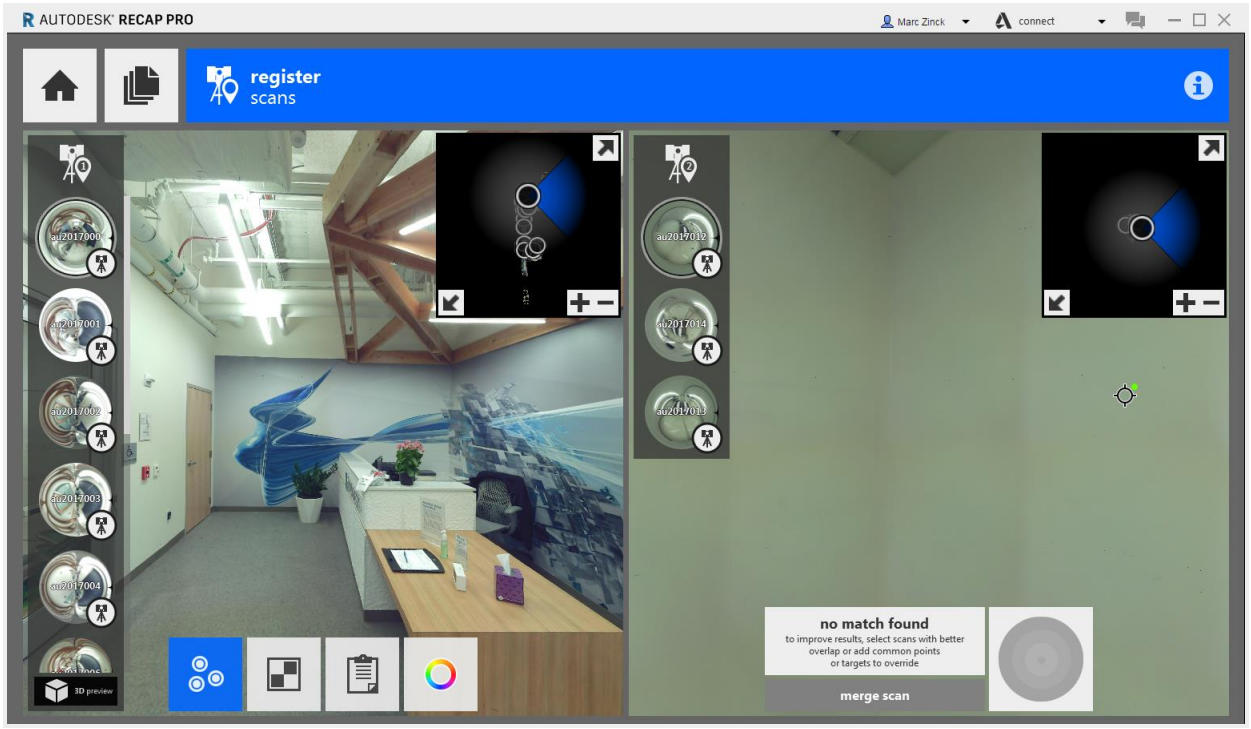




6. Open Project Again
7. Review Registration Status



8. Complete Registration


AUTODESK® RECAP PRO
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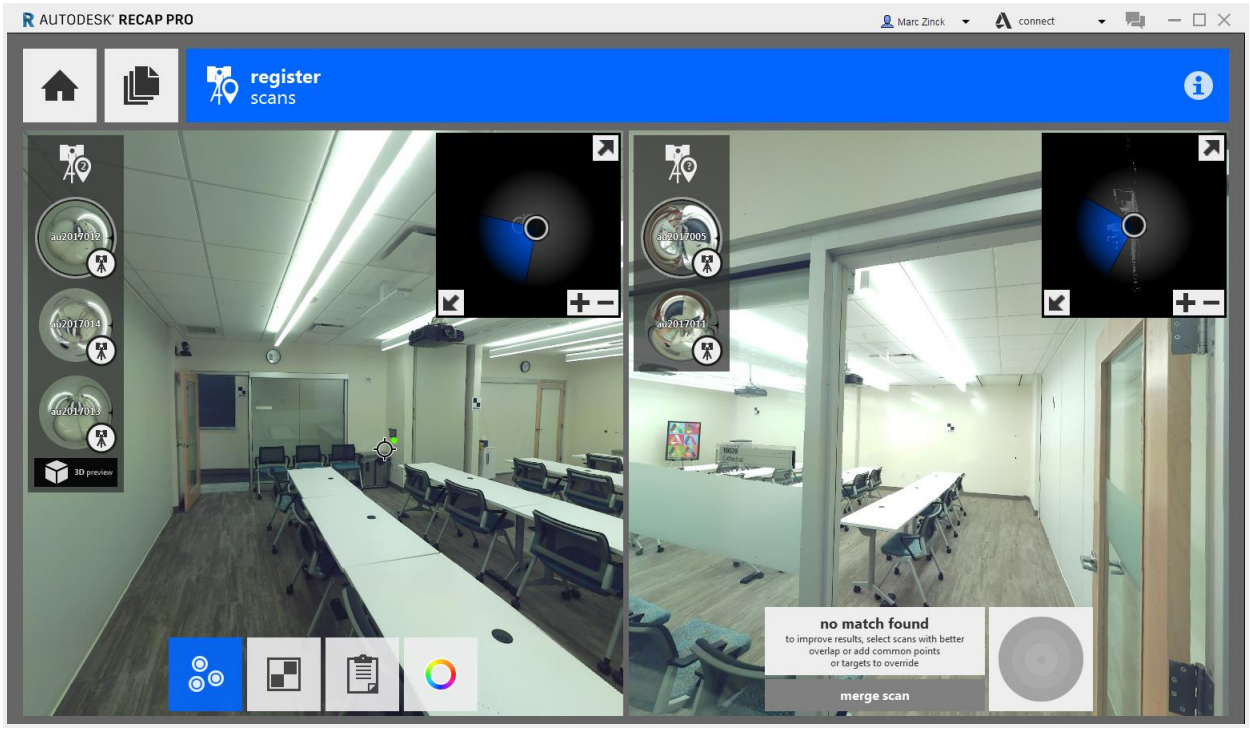
connect
register
scans
au2017000
au2017001
au2017002
au2017003
au2017004
au2017012
au2017014
au2017013
3D preview
no match found
to improve results, select scans with better overlap or add common points or targets to override
merge scan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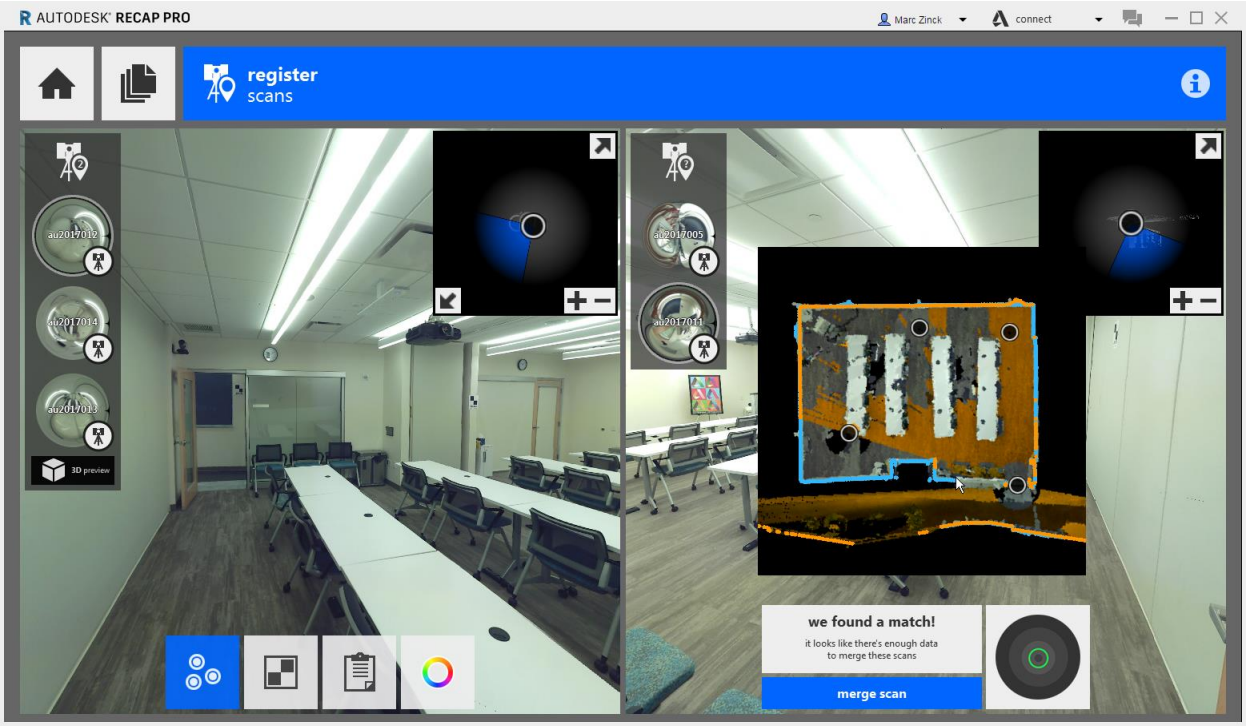
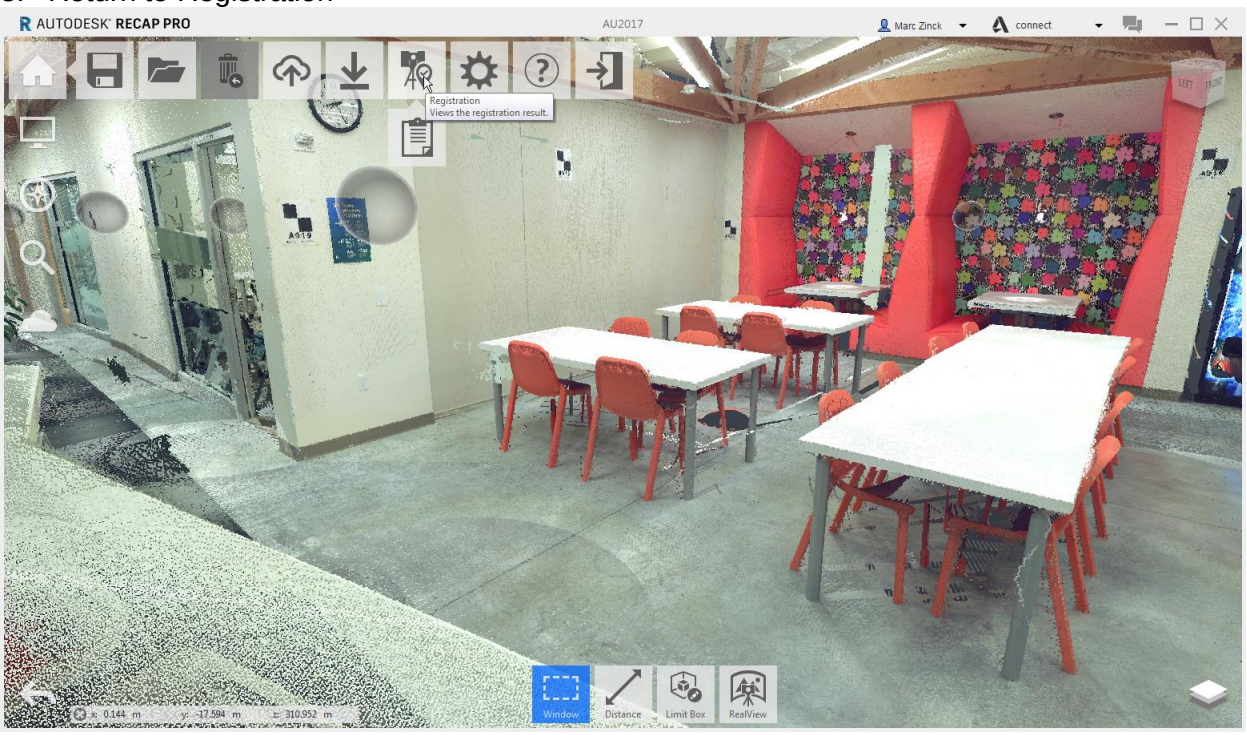
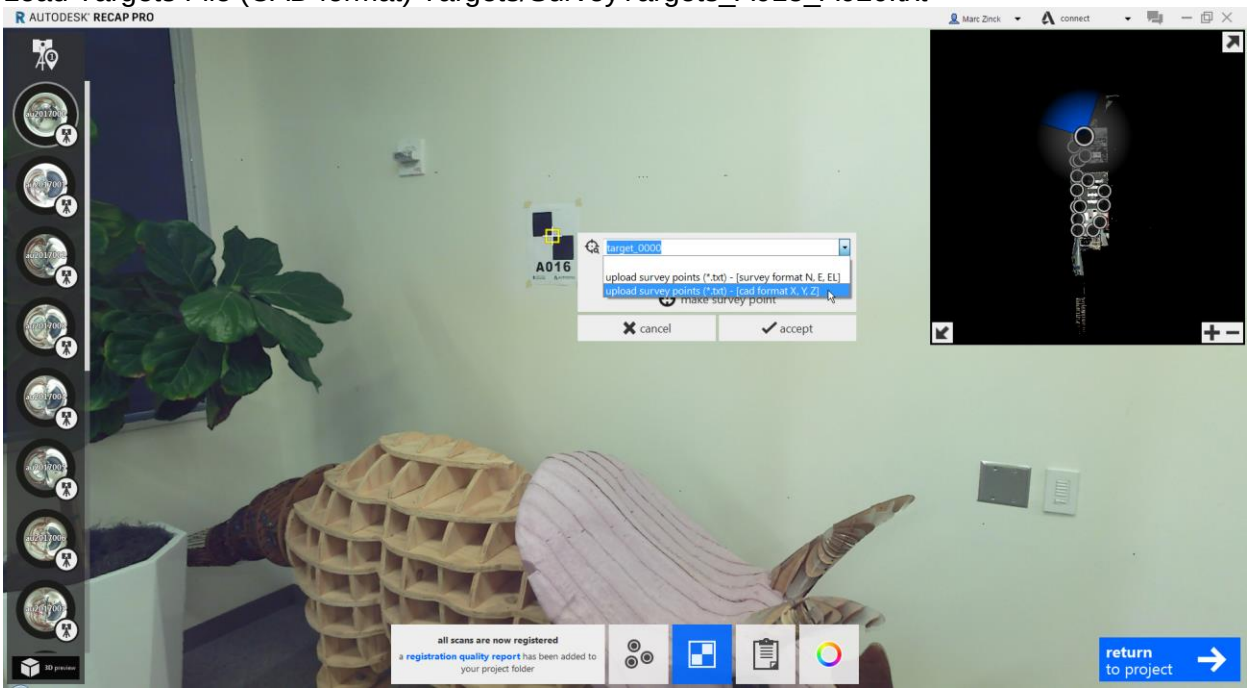


Exercise #4: Survey Alignment With Targets

1. Restore ReCap/AU2017.rcp from Backup folder if needed
2. Open ReCap/AU2017.rcp
3. Return to Registration



4. Load Targets File (CAD format) Targets/SurveyTargets_A015_A020.txt



5. Label AXXX Targets
6. Observe RMS as more targets are labeled
7. Observe how point cloud is now aligned to the survey targets

Exercise #5: Navigation Fundamentals

1. Open ReCap/AU2017.rcp
2. Navigate in 3D
    - Rotate, Pan, Fly
    - Perspective / Ortho
3. Review Project Navigator
4. In 3D Mode Click RealView Button
    - Notice how camera moves to nearest RealView
5. Navigate Between Mirrorballs in RealView
6. Return to 3D by clicking 3D View Button
- Notice how the camera moves to nearest RealView
7. Review Color Modes in 3D
8. Enter RealView
9. Toggle between Intensity and RGB Mode in RealView

Exercise #6: Tools

1. Open ReCap/AU2017.rcp
2. Perform Editing Tasks (Remove a table or other object from scene)
    - Clip
    - Delete
    - Regions (Put an object in a region)

3. Limit Box
    - Pick Mode
    - Resizing with mouse
        Hold Shift to grab back face
    - Resizing with keyboard
        Create a Slice of a Desired Width
    - Rotation
        Hold Ctl key to grab edge.
4. Annotations, Markups & Measure

Exercise #7: Image Export

1. Open ReCap/AU2017.rcp
2. Setup a pleasing view
3. Export an Image (Place it in a newly created directory called Exports)
4. Change the Background
5. Image Export performs high resolution exports with edits, clips, and annotations in 3D and RealView
6. Create annotation
7. Export an Image
8. Export an Image using transparent background

Exercise #8: View States

1. Open ReCap/AU2017.rcp
2. Create several View States
    - 3D, 2D
    - Use LimitBox & Clips, then create a viewstate

2. Organize View States into Folders.
3. Create a Floor Plan ViewState

Note: View States Capture Full Camera Parameters including Ortho and Perspective Mode.

Exercise #9: Basic 3D Flythrough

1. Open ReCap/AU2017.rcp
2. Create 3 ViewStates in 3D
3. Export a Video

Exercise #10: Story Telling

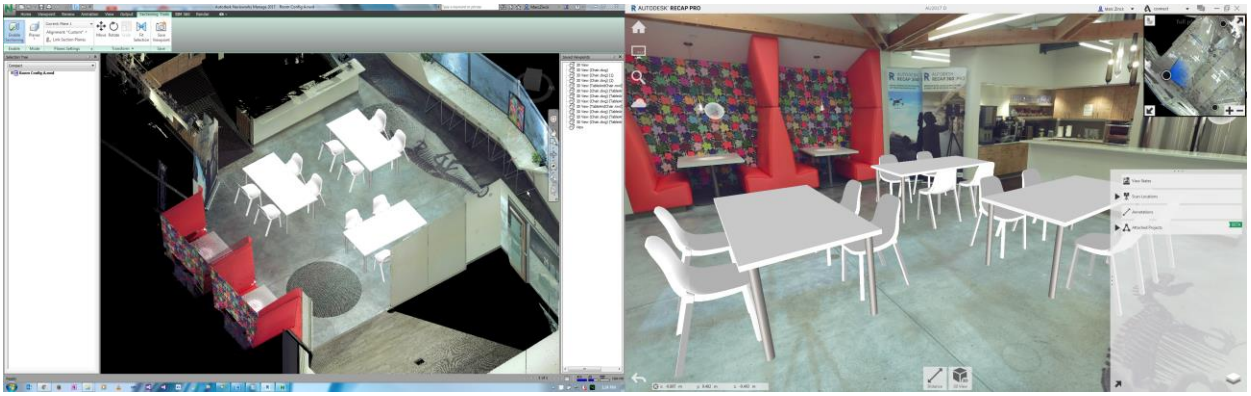
1. Create View states in RealView with markups and annotations
2. Export a video toggling the annotations visibility between view states.

Exercise #11: Smooth Transitions

1. Open ReCap/AU2017.rcp
2. Enter A RealView of your choice
3. Select a Starting View
4. Create a View State

5. Transition to 3D
6. Create a new View State
7. Enter a different RealView
8. Select a desired end state
9. Return to 3D by clicking the 3D View button
10. Create a View State
11. Return to RealView by clicking the RealView button
12. Create a View State
13. Export newly created View States as a Video

Exercise #12: Render CAD in Photo Real Context

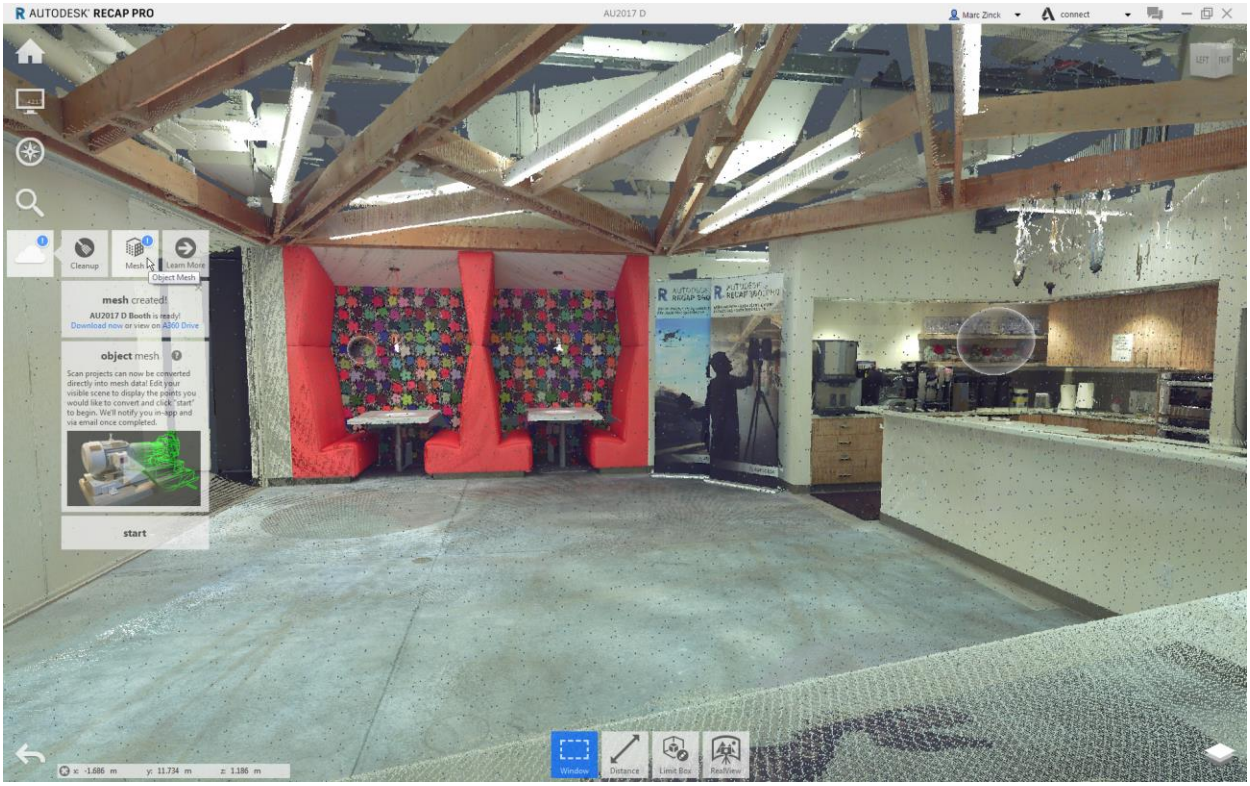


1. Open ReCap/AU2017 D.rcp
2. Launch Navisworks Manage
3. Create an NWD and attach ReCap\AU2017.rcp along with the desired CAD Models
4. Return to ReCap Pro
5. Attach NWD to ReCap Pro

6. Enter RealView to view model
7. Navigate to different RealViews for new vantage points
8. Return to Navisworks
9. Modify NWD configuration (Rotate, Move, Change Color)
10. Return to ReCap Pro
11. Refresh Attached Project in Project Navigator
12. Attach a second NWD
    a. Notice that visibility can be toggled to view different configurations
13. Create View State
14. (Optional) Export a Video from a set of View States

Exercise #13: Create a Textured Mesh From Scans

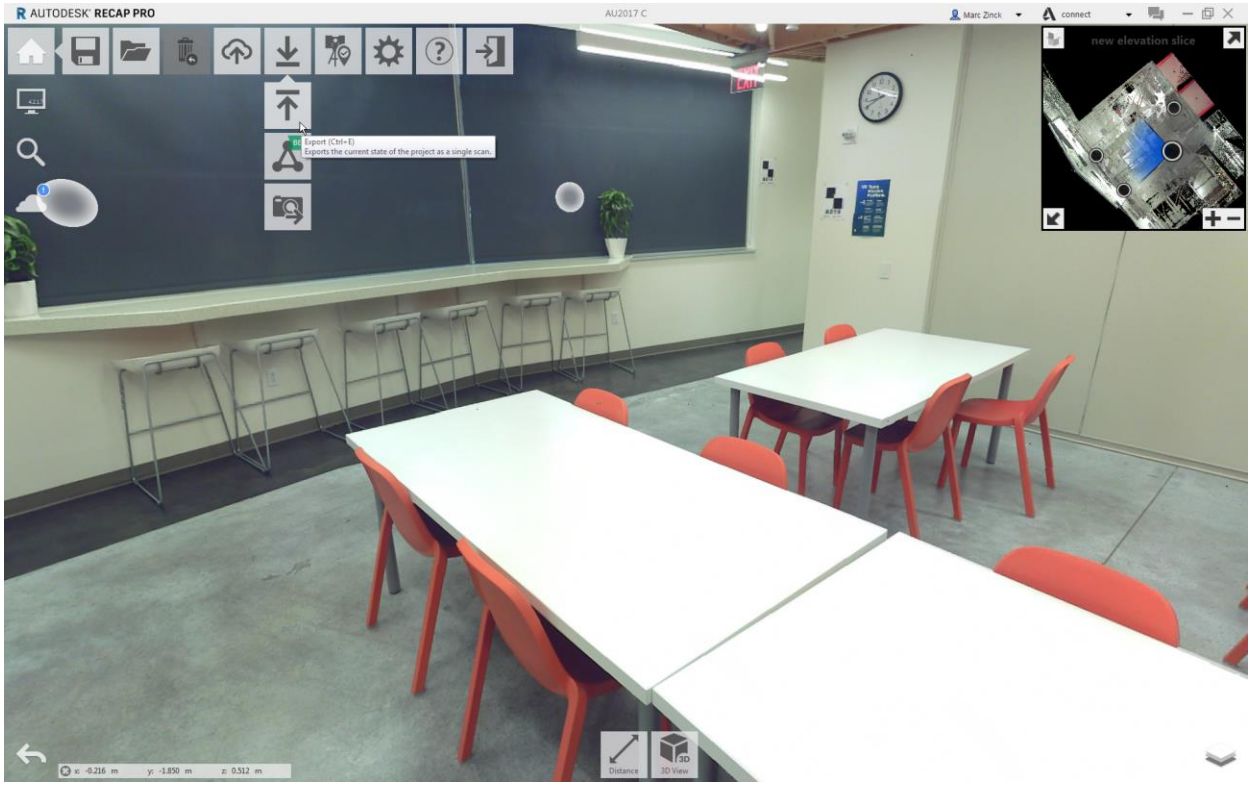
1. Open ReCap/AU2017 D.rcp
2. Attempts to run Scan to Mesh on the entire project should result in a warning.



3. Use the Limit Box Tool to select a portion of the point cloud
4. In Windows Explorer, Browse to the Mesh Directory and open AU2017 D Booth.rcm in ReCap Photo to see an example of the output produced by the cloud service.

Exercise #14: Unified Point Cloud with RealViews

1. Open ReCap/AU2017 C.rcp
2. Create a unified point cloud using export point cloud (one has been provided for you in the directory AU2017 Unified)


AUTODESK RECAP PRO
AU2017 C
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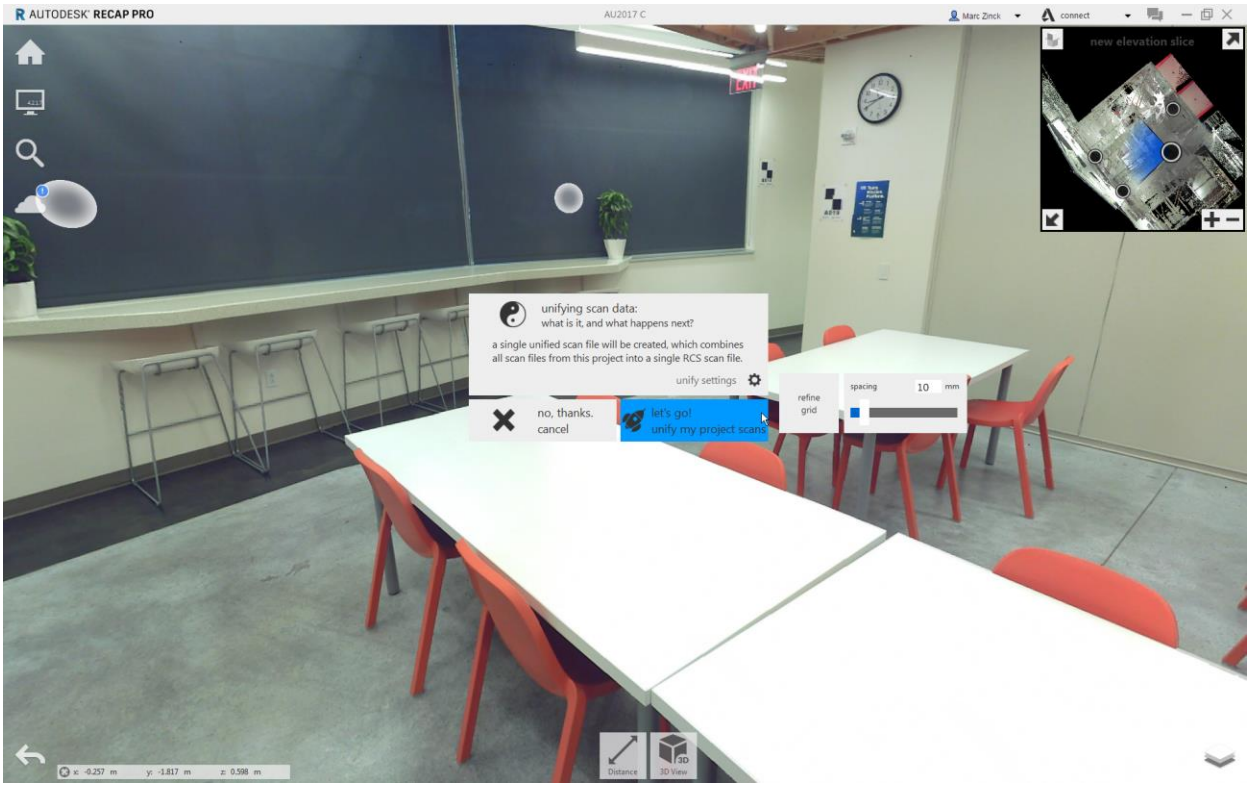
connect
new elevation slice
Export (Ctrl+E)
Exports the current state of the project as a single scan.
Distance
3D View


AUTODESK RECAP PRO
AU2017 C
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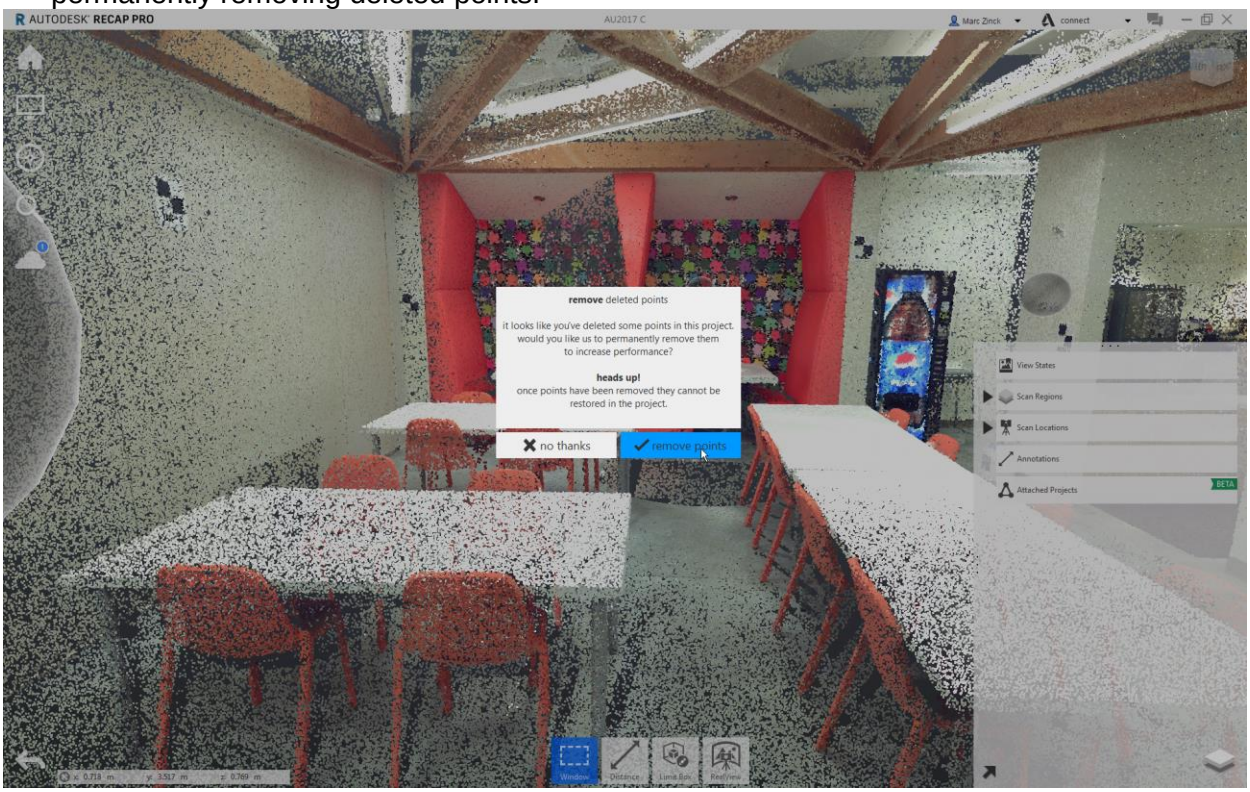
connect
new elevation slice
unifying scan data:
what is it, and what happens next?
a single unified scan file will be created, which combines all scan files from this project into a single RCS scan file.
unify settings
no, thanks.
cancel
let's go!
unify my project scans
refine grid
spacing
10
mm
Distance
3D View

3. Make sure that clips are off and the limit box is reset.
4. In 3DView, select all the points using a fence filter and delete them.
5. Import the previously stored unified RCS
6. Save the project and select yes to optimization
7. Run Save As… and select a location to store the new project – Chose yes to permanently removing deleted points.



8. Inspect the new project directory. The total project size should be reduced and both 3D points and RealViews will be available

More Resources

Product Page: www.autodesk.com/recap
Youtube Channel: https://www.youtube.com/user/autodeskrecap
User Forums: https://forums.autodesk.com/t5/recap-forum/bd-p/451

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