

Diamond Sponsors



AMD



AUGIWorld

The Official Publication of Autodesk User Group International

October 2018

Creative Customizing

Also in this issue:

- Save Time on Uninstalls
- CAD Managers: Develop a Thick Skin
- The AUGI Wish List



THE NEW Z WORKSTATIONS

HP's most powerful PCs



HP Z4

HP's bestselling performance workstation

Perfect for advanced 3D CAD and BIM, the Z4 delivers mainstream performance for a range of applications. With a broad set of features, you get all you need, nothing more.

hp.com/go/Zdesktops

HP Z6

A future-proof powerhouse

No matter what the future holds, you have the performance you need. The Z6 offers a range of processing power and the flexibility to expand components.

HP Z8

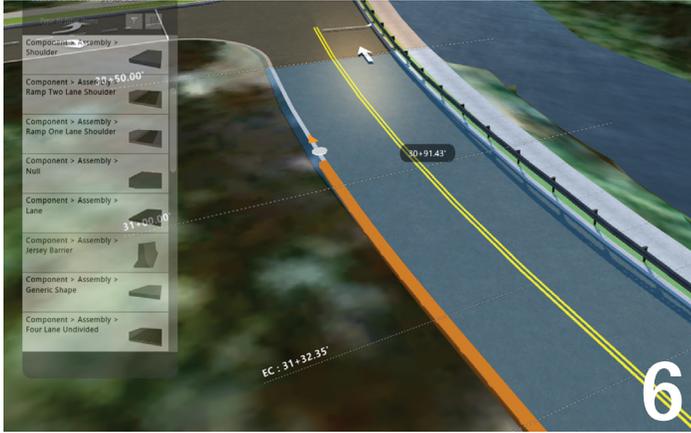
The world's most powerful workstation*

From rendering to VR to machine learning, the Z8 with NVIDIA Quadro® graphics can enable companies to break through in every form.

* Based on workstations as of September 25, 2017 and power based on processor, graphics, memory, and power supply.



contents

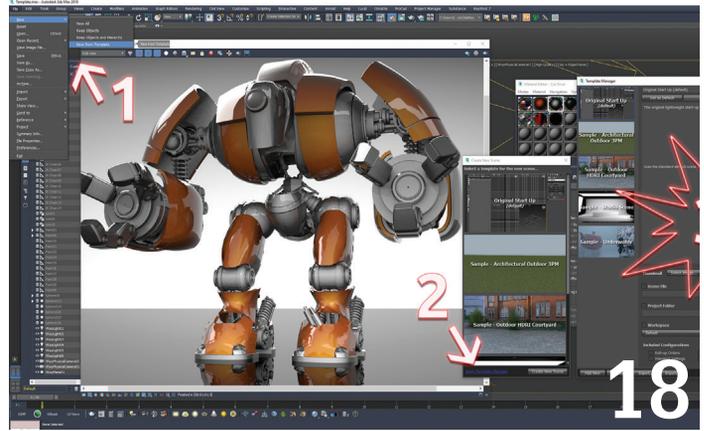


6 **InfraWorks** Component Road Customization

16 **Revit Structure** To Customize or Not

18 **3ds Max** Customization with 3ds Max

22 **AutoCAD** Destination Customization:
Customized Solutions for AutoCAD



28 **Revit MEP** Risers and One-Line Diagrams:
Not Just a One-Way Street

34 **Project Management** Uninstalling Autodesk
Software? Let's Save You Some Time!



columns

4 Letter from the President

10 CAD Manager

12 Wish List

39 Inside Track



*Looking south at the N Clark Street bridge,
Chicago, IL, USA*

Copyright © 2018 Tatjana Dzambazova

Letter from the President



AUGI



This month's *AUGIWorld* is about customization, which means we've all got programming on our minds... but honestly, I really can't blame that on the magazine theme. I've been thinking a lot about how we interact with software—specifically, how we assign “responsibility” to the programs we use.

It's very easy to fall into the habit of using passive language to describe software actions, or of assigning the action to the software itself. “I would have been here on time, but my maps app sent me the wrong way.” “My alarm didn't go off this morning.” “That Revit schedule isn't showing the right information.”

But is that really the best—or the safest—way to think about it? Any program is only as good as its input and its algorithm. A flaw or failure in either component can lead to suboptimal output. Did your maps app really send you “the wrong way” or did you miss a turn? When your alarm “doesn't go off,” did its internal clock break or did you forget to set it? If your Revit schedule doesn't look right, is it really broken behind the scenes or did you choose the wrong fields—or model the wrong elements? (Is it a coincidence that these examples also have to do with assigning blame?)

Most of us who aren't programmers tend to view software as a “black box.” We don't have the training or the expertise to fully understand the source code, so the output is all we have to go by. That's why it's our responsibility to thoroughly test any program or piece of code we intend to use in our workflow—whether it's a complicated Dynamo script you wrote yourself or a LISP snippet you downloaded from the AUGI forums.

How do we do this? It's pretty easy: feed the program input with known solutions and see if you agree with its conclusions. Start small and work your way up to more complicated problems. If the results coming from the program match up with your own solutions—based either on your own calculations or personal experience—you can start to trust the answers to problems with previously unknown solutions. (Remember the value of estimations, too. If you're expecting a number output, you should know beforehand whether that number is about 10, about 100, or about 1,000. It's a quick gauge of reliability.)

For more complex software, the output by itself isn't enough to completely earn our trust. We want to know how it works, preferably in as much plain language as possible.

This leads me to my second point, and what I'm beginning to think of as the three most important things in programming: Documentation, documentation, and documentation. All right, maybe that's a slight exaggeration. But I've encountered a few professionally released programs lately that have, at best, bare-bones help files. Getting started in these programs has been a challenge, to say the least. Without documentation, it's practically trial-and-error to understand what will work as input and what we should expect as output. Yes, good interface design can alleviate some of that work. But it makes it that much harder to trust the program's results.

If you're writing your own code, please, for the sake of those of us who will use your program in the future (including you, six months from now), include notes everywhere. Describe everything that's going on, and what the result of each step should be. It may seem like overkill, but your colleagues—or customers—will thank you for it. It goes back to our habit of assigning responsibility to software. Since it's unlikely that we'll stop saying “the program says...” we need to be that much more aware of how the software “thinks.”

In the end, just remember that every bit of software we use today was, at some point, written by a human being. (This statement may not be true once robots have taken over... but for now, I think it stands.) The output is based on human interpretation of data. Fortunately, software won't get offended when you question its results. Keep checking, keep verifying, and you'll be able to celebrate the things that technology enables you to accomplish instead of wondering what went wrong!

Kate Morrill
AUGI President

AUGIWorld

www.augiworld.com

Editors

Editor-in-Chief

David Harrington - david.harrington@augi.com

Copy Editor

Marilyn Law - marilyn.law@augi.com

Layout Editor

Tim Varnau - tim.varnau@augi.com

Content Managers

3ds Max - Brian Chapman

AutoCAD - Jim Fisher

AutoCAD Architecture - Melinda Heavrin

AutoCAD Civil 3D - Shawn Herring

AutoCAD MEP - William Campbell

BIM Construction - Kenny Eastman

CAD Manager - Mark Kiker

Inside Track - Brian Andresen

Inventor

Revit Architecture - Jay Zallan

Revit MEP - Nathan Mulder

Revit Structure - Jason Lush

Advertising / Reprint Sales

Kevin Merritt - salesmanager@augi.com

AUGI Executive Team

President

Kate Morrill

Vice-President

Scott Wilcox

Treasurer

Chris Lindner

Secretary

Kimberly Fuhman

AUGI Management Team

Kevin Merritt - Director of Communications

July Ratley - Director of Finance

David Harrington - Director of Operations

AUGI Board of Directors

Brian Andresen Frank Mayfield

Kimberly Fuhrman Todd Rogers

Chris Lindner Scott Wilcox

Publication Information

AUGIWorld magazine is a benefit of specific AUGI membership plans. Direct magazine subscriptions are not available. Please visit www.augi.com/account/register to join or upgrade your membership to receive *AUGIWorld* magazine in print. To manage your AUGI membership and address, please visit www.augi.com/account. For all other magazine inquiries please contact augiworld@augi.com

Published by:

AUGIWorld is published by Autodesk User Group International, Inc. AUGI makes no warranty for the use of its products and assumes no responsibility for any errors which may appear in this publication nor does it make a commitment to update the information contained herein.

AUGIWorld is Copyright ©2018 AUGI. No information in this magazine may be reproduced without expressed written permission from AUGI.

All registered trademarks and trademarks included in this magazine are held by their respective companies. Every attempt was made to include all trademarks and registered trademarks where indicated by their companies.

AUGIWorld (San Francisco, Calif.)
ISSN 2163-7547





subscribe here

ARCATECT

ARCATECT™ is the new e-newsletter from ARCAT. Get all the latest industry news from all over the world delivered to you each day, week or month. We let you choose how often. To subscribe, go to www.arcat.com/arcatect. As a bonus, we won't sell your name to anyone!



NEWSLETTER

Component Road Customization



Figure 1: Component placement along a road

Roads are one of the most powerful tools in InfraWorks®. Component roads, to be exact. Why? Because component roads allow you to design based on AASHTO and DMRB design standards, manipulate vertical curves using a live profile editor, and generate cut/fill calculations based on their associated grading styles. But the

real power of component roads lies in their ability to be highly customized to create just about any roadway style, intersection, or configuration imaginable.

From Autodesk InfraWorks Help: “Component roads are assemblies of different parts, such as lanes, curbs, gutters, medians, shoulders, and sidewalks. You can add, split, delete, or modify EVERY component



Figure 2: Road Assembly > Add To Library

Simply put, you can easily piece together a roadway using any number of components, placing them at any location along a road, and for any length, and giving them the ability to transition in and out smoothly (for example, to create a bus drop-off area) to give your road the right look and feel for your project.

You can also add decorations along the road such as guard rails, barriers, light poles, etc. And when your roadway is complete, you can then save that assembly for later use in your project. Or, as you'll see toward the end of this article, how you can save the assembly and use it in any project.

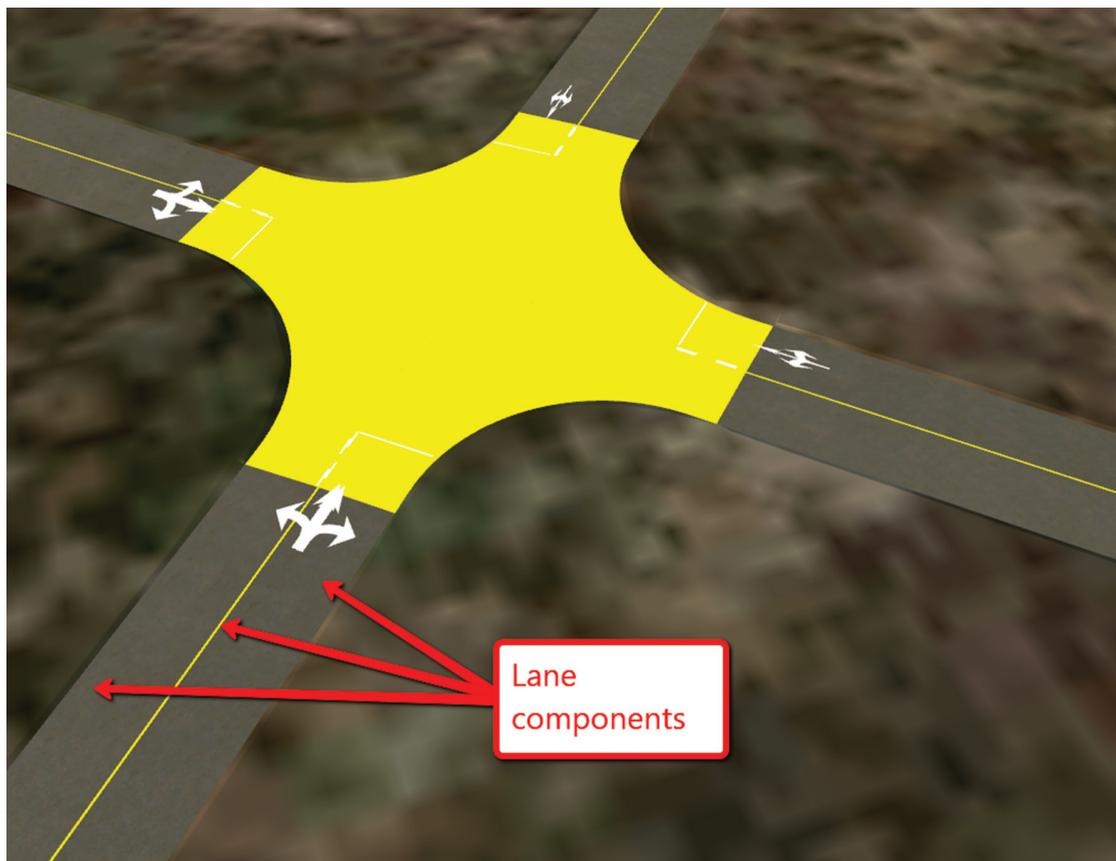


Figure 3: Incorrect use of components

When working with component roads, it's important to understand that the individual components you choose perform specific functions and may react unexpectedly when used in a situation they aren't designed for. Figure 3 shows an example of a component road that was built using three lane components; one lane component to represent the single yellow stripe and two-lane components for the actual drive lanes on either side of the yellow stripe. When the road is by itself it looks fine, but when it crosses another road, things go awry.

Because there are three lanes in use, InfraWorks assumes the yellow stripe is actually a drive lane (which technically it is, in this example) and therefore uses

and assembly in your roadway project, and save custom road assembly configurations to your Library so you can use them again." See Figure 2.

that center lane's material to fill the intersection. Also notice the turn arrows on the bottom and left side extend over the yellow line. Again, this is because a lane component was used.

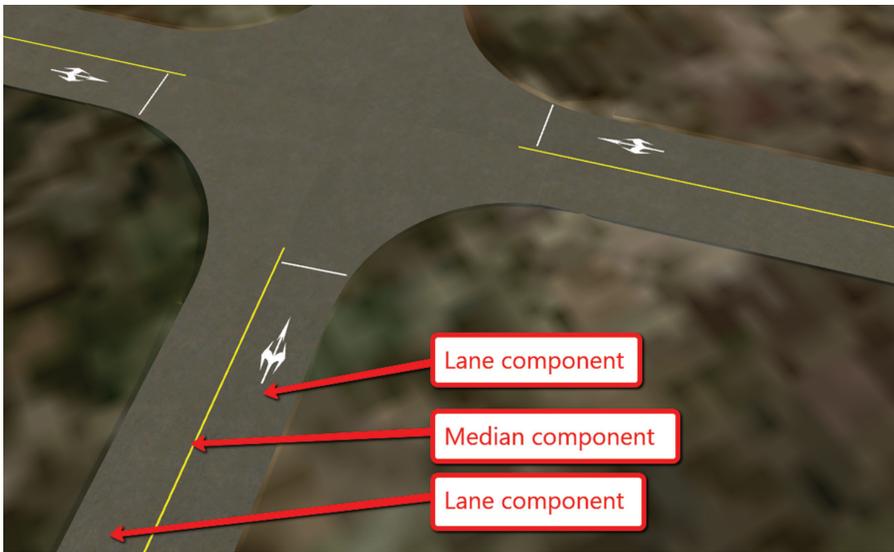


Figure 4: Correct use of components

The proper way to create this particular component road style is to use a median component for the yellow stripe and lane components on either side. This time the turn arrows clean up better and do not extend past the yellow line because a median component was used (Figure 4).

I mentioned earlier that you can save the roadway assembly and use it in any project, and here's how. When you save a custom component road assembly, its definition and preview image are saved to the project directory in a folder labeled "Custom." In that folder are two files associated with your custom roadway style: a .PNG (the thumbnail preview of the road) and a .ACITEM file (this is the actual roadway definition and tells InfraWorks which components to use). To find these files, browse to the following location:



Figure 5: Image credit to Matt Wunch

```
C:\Users\\
Documents\Autodesk InfraWorks
Models\Autodesk 360\\.files\
unver\Content\Styles\
Component\Custom
```

Then copy them to C:\ProgramData\Autodesk\InfraWorks\LocalLibrary\Styles\Component\Assembly and every project (new and existing) will be able to use your custom roadway style.

If you've never used component roads before, the examples in Figures 5 and 6 will hopefully inspire you to give them a shot.



Figure 6: Image credit to Daniel Iliyn, PE, David Evans and Associates, Inc.



Matt Wunch is the BIM Manager for ARCAT.com in Fairfield, CT. He is an Autodesk Expert Elite member, Revit Certified Professional in Structure, Architecture, MEP – Mechanical and MEP – Electrical, a member of the planning committee of the Construction Institute's BIM Council, and owner & FAA licensed sUAS pilot at SkyViz.io. He can be reached for comments or questions at matt.wunch@gmail.com or on Twitter @MattWunch.



AUGI Members Reach Higher with Expanded Benefits

AUGI is introducing three new Membership levels that will bring you more benefits than ever before. Each level will bring you more content and expertise to share with fellow members, plus provide an expanded, more interactive website, publication access, and much more!



Basic members have access to:

- Forums
- *HotNews* (last 12 months)
- *AUGIWorld* (last 12 months)

DUES: Free



Premier members have access to:

- Forums
- *HotNews* (last 24 months)
- *AUGIWorld* (last 24 months)

DUES: \$25



Professional members have access to:

- Forums
- *HotNews* (full access)
- *AUGIWorld* (full access and in print)
- ADN 2013 Standard Membership Offer

DUES: \$100

**Are you ready to upgrade yourself and your membership?
Access additional benefits and upgrade at www.augi.com**



Developing a Thick Skin



Getting frustrated by technology happens all the time. Everyone has troubles, but not every trouble is related to the technology we use. But tech sometimes gets blamed for problems and delays. It is so easy to blame technology that everyone does it. If you are late for a meeting, "My calendar did not remind me." If you are uninformed on the progress of a project, "I did not get the email." If you fail to submit on time, "My system crashed and lost the file." While all of these may be legit, many times I hear people blame technology for their woes. The system is not working. The files are corrupt. The menus are not created right. The standards are getting in our way. The thing is just not working. I can't log in. My network drive is not mapped. I cannot print. On and on...

As a tech manager when you hear these things, you tend to take it as an affront. The underlying sentiment behind many of these

statements seems to say that "YOU" are not doing your job right, or maybe not doing it at all. Or at least you feel like it is about you. You feel the weight of the comments and you are frustrated by them. But you are doing your job, usually with limited time and resources to make great impacts. How can they blame you, or blame the machines, or the configs, or the setup, or the customization? The comments and critique goes on forever.

You feel bad. You feel frustrated. You feel angry. You feel defeated. You want to do the best you can and be appreciated. You are doing so much for the firm. They never see what you bring to the table. Your mind is racing down the road of anger and bitterness (if this has been happening for a while).

You need to have thicker skin. Having thick skin means you are not easily insulted, hurt, or upset. It means that you don't easily anger. You are not easily offended by the comments of others.

JUST PUSH PAUSE

As your inner temperature rises at these comments, you need to push pause. Slow it down. Take it in stride. This is not easy for some. You may need to verbally ask others to slow down. Don't let the comments just keep rolling on or just keep quiet until they are done. You may need to step away from the situation. If your blood is starting to boil, then exit the scene. Just tell them you will be right back. Tell them you need to go check on something related to the issue. Just get out of the area any way you can. Better to bail out than to boil over.

THINK IT THROUGH

First – don't take things personally. Most likely no one is out to get you. It might feel like it, but it probably is not true. Their comments are generated by frustration with things going wrong. They just want things to work. They have pressures and deadlines that cannot slip. They need things to go as planned and when they don't, they look for something (or someone) to shift that pressure. As they shift some of the pressure, look at it with the perspective that you are assisting to relieve that pressure and avoid piling on more. Say something like, "Things may not be going as we planned, but I think we can get past this if we look at it together." Purposely take a team attitude and use "we" and "together" in your response.

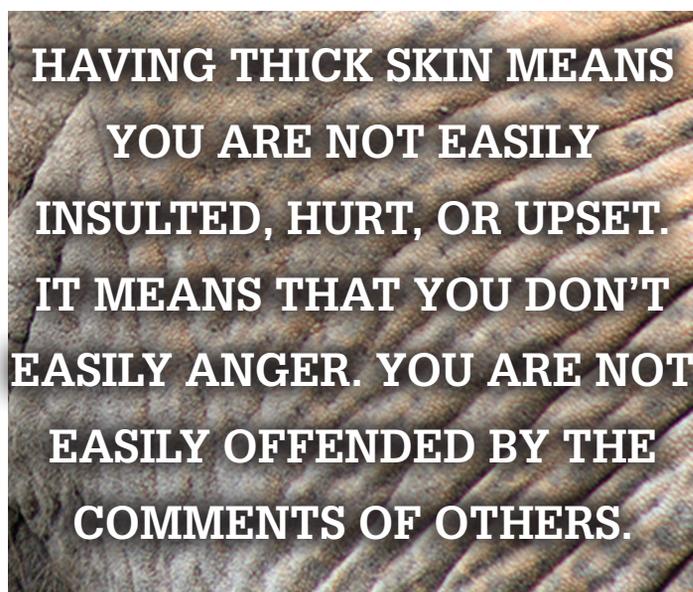
If the person really is attacking you personally, like hinting at or saying "You do not know how to do your job," then you should still try to manage your attitude. Don't fight back—that escalates the problems. Saying something akin to "It may not be working well right now, but others have not seen this trouble. Things successfully worked in the past, there must be something new going on."

Second – see it through their eyes. You may not know the whole story. There may be unseen pressures and compounded failures that are making the current situation even more stressful. They may be having a bad day in the office or have come to work to escape the pressures at home. They may be exhausted, fearful, overworked, stretched to the limit, or just need to get past this issue so they can move on to bigger ones. Think about others first. They actually need help. You should be there to help.

Third – move past it, at least in your head. Don't stew on it. Having thick skin means things can bounce off of you. Don't let it fester. Don't go into the "fix it" mode with snarling teeth. You don't want to grumble during the repair phase, either. Even after you weather the storm of troubles, don't keep thinking about it or making snide comments about the person. Change the subject in your head. Move on to another topic. Don't keep replaying the incident and ratcheting up your bitterness toward the person. Talk to someone outside the organization if you need to vent.

MOVE TOWARD A SOLUTION

Ready to make progress? Remember: people are not perfect—you or them. When criticism comes your way, admit when you are wrong. Just say, "Well, that did not work like I thought it would." Do not force blame onto them. They may have done some crazy wrong stuff, but they thought it would work. They may not know how to use a specific tool the right way, but they just need more



guidance or training. Ask them if they might be open to suggestions on how to try another method.

AFTER THE STORM PASSES

Don't worry about how you look. You have a track record of success—one or two negative comments will not derail your career. People on staff know that you get things done. They know you make good decisions. They are convinced by your past record of wins that you are the "go to" person. A few bumps can be forgiven. Don't worry too much about complaints. It's not a big deal.

Take away the gold nuggets. Try to address the items of truth mixed in with the rants. Hints at troubles come under the breath. Listen to murmuring and you can avoid the shouting. There is always some area to improve on. Some area to review again. Some tech that has languished too long. Look at the choppy water as an opportunity to tune your navigation skills. Learn from it. Get stronger. Thicken your skin.



Mark Kiker has more than 25 years of hands-on experience with technology. He is fully versed in every area of management from deployment planning, installation, and configuration to training and strategic planning. As an internationally known speaker and writer, he is a returning speaker at Autodesk University since 1996. Mark is currently serving as Director of IT for SIATech, a non-profit public charter high school focused on dropout recovery. He maintains two blog sites, www.caddmanager.com and www.bimmanager.com.

Influence Autodesk's Tomorrow



*“Wouldn’t it be nice if...”
“Here’s an idea...”*

Statements like these, borne out of inspiration (or frustration), are the seeds of innovation and progress. Sometimes, we can take matters into our own hands, inspired to create or driven to find a solution of our own. Other times, we are limited to just accepting, complaining, or suggesting.

In our professional lives as Autodesk product users, how do we get from “Wouldn’t it be nice if...” to “That’s a great feature!”? Enter the AUGI Wish List, your proverbial megaphone to let Autodesk know what you want.



THE BACK STORY

The AUGI Wish List (www.augi.com/wish-list) predates AUGI itself, having its roots in the mid-1990s, back when the organization was known as NAAUG, the North American Autodesk User Group. At that time, the Wish List served as one of the few channels through which users could make their desires known to Autodesk. It received a major overhaul back in 2011 and continues to evolve as one of AUGI’s primary member benefits.

Technology has since enabled Autodesk to shorten the distance to users, creating additional paths to engage, interact, and hear from its customer base through programs such as the Feedback

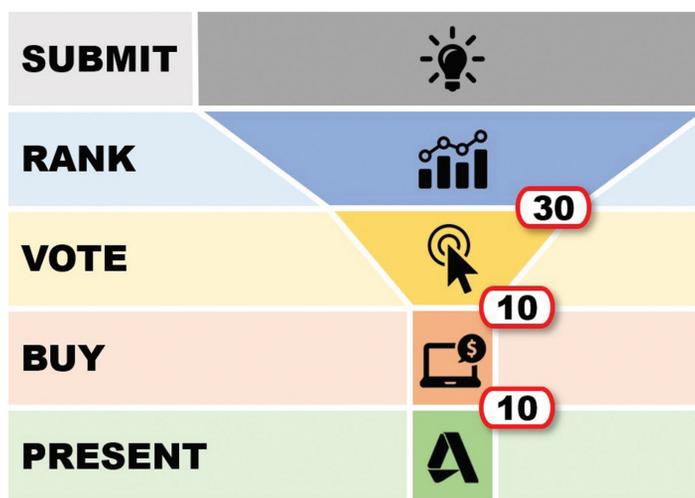
Community (beta.autodesk.com), the Autodesk Product Feedback page (autodesk.com/company/contact-us/product-feedback), and various product-specific IdeaStations (forums.autodesk.com). Autodesk also connects with customers more directly via surveys, customer interviews, site visits, as well as group and one-on-one feedback sessions at Autodesk University.

Even with all these other venues, Autodesk still proudly cites the AUGI Wishes “granted” in their new product marketing. And there have been quite a few granted! According to AUGI’s Hall of Fame (augi.com/wish-list/hall-of-fame), there have been more than 800 wishes that have made their way into Autodesk products. As far as I can tell, AutoCAD 2009 has the distinction of being shipped with the most granted wishes in one release: 17!

OUR COLLECTIVE VOICE

At each step in the Wish List process, AUGI and Autodesk rely on our members, and their customers, to move wishes through their lifecycle, from inspiration to implementation. Let’s take a deeper look at each of the steps shown in this overview diagram:

Submit – The next time you have one of those “It would be cool if...” thoughts, jump on over to augi.com/wish-list and click the “Make A Wish” link. Select the desired product (Note: the list of products you see is determined by the “Products I Use” list in your profile). Before submitting your wish, enter a search term related to your idea to see if a related wish already exists in the system, thus preventing duplicate wishes. If the search returns a wish that looks similar, you can throw your support behind it by ranking it (we’ll explain that next) or see what has been discussed about it in the related forum thread. If your wish is unique, you can proceed using the “Submit Your Idea” link. Be sure to enhance the description of your wish by using examples and adding hyperlinks. Unfortunately, it’s not possible (at this time) to add images, but you could always create a Screencast and place the link in your description if that would be helpful.



Once this initial step has been taken, it’s now time for the membership to get involved and add value to the remaining steps.

Rank – The purpose of ranking is to whittle the magnitude of wishes down to your “top 30.” Ranking is done via the sliding scale shown below:



In addition, three other options are available:



- Engage with other members in the wish’s forum thread to:
 - Discuss the wish to clarify or expand on the requested feature.
 - Share and brainstorm workarounds (hopefully temporary ones!) to be used while waiting for the wish to be granted.
 - Share solutions that are available from other users or developers.
- Mark wishes that may already exist in the product.
- Flag wishes for removal from the Wish List.

I’m not gonna lie—ranking wishes is addictive! Since wishes are presented randomly, it’s fun to see what will show up next. During your next break, why not influence the productivity software of tomorrow rather than mindlessly scrolling Instagram?

Vote – The Vote page presents you with the currently ranked top 30 list and asks you to select your ten favs! Just picking the top ten, however, still doesn’t give Autodesk quite enough information because they’re not in any particular order. Yet.

Buy – It’s time to “put your money where your mouth is,” as the saying goes. Buying is the final and crucial step. Each AUGI member has \$500 in “wish cash” that they can distribute among the ten wishes. The allocation of funds prioritizes the top ten into their order of importance.

Present – Autodesk product developers have year-round access to the Wish List and can, at their discretion, take action on any wish. The official hand-off, though, occurs at the AUGI General Meeting held in conjunction with Autodesk University each year. During the AGM, an Autodesk product representative is presented with their respective Top Ten list.

WISH LIST PLAYOFFS

Too many steps, you say? Frankly, I thought so too at first. Amazing what a little research (writing this article) does to changing one’s perspective. It might help if you think of these steps as rounds in a sports playoff system: quarter-finals (ranking), semi-finals (voting), and the final (buying). Unlike a playoff system, the Top



Wish List

Ten is dynamic; it is recalculated each week based on the “buys” of the AUGI community. So, if a few wishes you had previously put money on have been “voted off the island” so to speak, the funds you had spent on those wishes is now free to be reallocated among the new Top Ten. AUGI will let you know this via a “You have new wish dollars to spend...” email. Additionally, you can always reallocate your wish cash at any time.

MAKING THE CUT

So, now that the AUGI community has done its part and handed everything over to Autodesk, what’s next? Well, there are no guarantees that your wish will make the cut, but the 800+ wishes granted is promising! Ultimately, though, Autodesk gets the last say.

Timing also plays a part in when, and which, wishes are implemented. A wish submitted later in the year, even with lots of buys, is very unlikely to appear in the very next release of a product. Autodesk is already working on future product releases, so wishes may have to wait a release cycle or two before they can appear in product.

How, then, does Autodesk decide? How are the wishes weighted? I had the privilege to speak with Autodesk’s Brad Holden, Product Manager for AutoCAD platform. He mentioned a number of factors that Autodesk takes into consideration when processing feature requests.

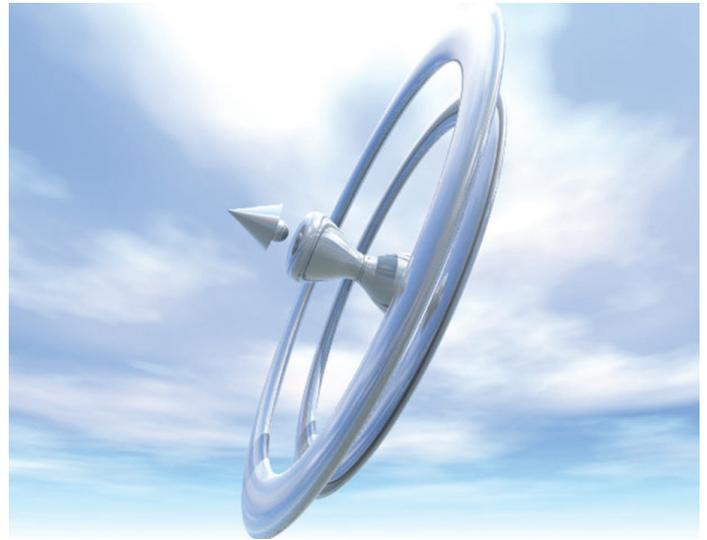
- Pervasiveness – What percentage of users are affected by this issue?
- Frequency – How often do users run into this issue?
- Severity – How big of a problem is this issue?
- Strategy – How does this request fit into Autodesk’s overall strategy for the product?
- Feasibility – From an engineering perspective, is it even possible?

For the most part, strategy and feasibility are outside the direct influence of the Wish List. The other three factors—pervasiveness, frequency, and severity—are much more directly linked to it. The Rank/Vote/Buy process is a very effective way for Autodesk to determine these factors. Pervasiveness is inferred by the number of members that buy each wish. And, as Holden also noted, “The ‘Buy’ feature helps Autodesk because each individual user is going to optimize how they spend their money based on the severity and frequency of the problems they face.”



GET INVOLVED

The Wish List system is only as effective as the participation of the AUGI membership. The system doesn’t operate autonomously. In addition to participating in the Rank/Vote/Buy process, AUGI needs volunteers to help review and vet wishes as well. According to Wish List Manager, Rick McNeil, “We receive about 30 wishes per day, so having a handful of reliable volunteers is extremely beneficial.” Sometimes wishes that are submitted from our international members may have language translation issues



to address. Additionally, a wish submitted in an industry-specific “language” may require a volunteer with experience in that industry to translate it into more general language. If you consider yourself an SME (subject matter expert) in one of the seven different product Wish Lists (AutoCAD, Civil 3D, Inventor, Revit, Revit Architecture, Revit Structure, and Revit MEP) and are willing to give back to AUGI an hour or two a week, it would be a huge help. Just send an email to volunteering@augi.com to get plugged in.

CONCLUSION

A number of AUGI’s programs are designed to provide value primarily to the members. The Wish List, however, has the unique characteristic of having value not only for our members, but also for Autodesk and their product development teams.

It is AUGI’s desire that the Wish List continues to be relevant to all parties. We are committed to doing our part by growing and improving the Wish List system. As a result, we hope it continues to be an “idea super highway” linking the innovative ideas of the users with the development resources within Autodesk.



Chris Lindner is a 30+ year AutoCAD user, working primarily in the architecture industry. He has worked as a drafter, IT manager, trainer, programmer, and Autodesk consultant for notable companies such as Kroger, L Brands, and Huntington Bank. He currently serves as Treasurer on the AUGI Board of Directors, was a member of Autodesk’s AutoCAD Mentor team, and is a returning speaker at Autodesk University. Chris is the CAD Manager for Shremshock Architects & Engineers in central Ohio. He can be reached via email at chris.lindner@augi.com.



BILT Europe
11-13 October, 2018
GR - Exhibition & Convention Centre
Ljubljana, Slovenia

Register Now!
www.rtcevents.com/bilt/eur18

Get a glimpse into the future of BIM in AEC

BILT is a global BIM technology conference series dedicated to a sustainable built environment to **cater to the needs of those who design, build, operate and maintain our built environment.**

Our sessions focus on the use of **BIM tools, BIM processes and workflows**, as well as **project and practice strategies and leadership skills**. **Pick and choose your program** from classes covering architecture, engineering, construction, infrastructure, computational design, procurement, project management and business strategy to name a few!





To Customize or Not


 Customization can be helpful, but it can also be detrimental to a workflow. Instead of looking at actual cases of customization, let's consider this argument: to customize or not.

WHAT IS CUSTOMIZATION?

As I often like to do when looking into these types of topics, I list the definition. Customization is the action of modifying something to suit a particular individual or task. Obviously in this case, the something in this conversation is going to be the software and the people using it.

There are many different types of customization that can be applied to Autodesk software. If you do a Google search for Autodesk customization, you will get a few (hundred thousand) returns on the search. Autodesk does their own customization,

companies specialize in doing customization, users can create their own customization, and so on.

IS CUSTOMIZATION A GOOD THING OR A BAD THING?

There are good and bad uses of customization. Early in my career I worked for a company that had purchased a customized toolbar that ran in AutoCAD® to apply all company standards and layers as well as typically used blocks. This tool was very helpful for the speed of the workflow, but when it broke, it destroyed the workflow. The problem was the CAD users had grown so accustomed to using only that toolbar to set their layers that they forgot how to do it natively in AutoCAD.

Customization is good when it helps improve the workflow and the time to deliver the client a finished project. It can be helpful on a repetitive task that takes a tremendous amount of time.

It can be bad when it “dumbs down” the person using the software, much like at that job from years ago. If the person can’t utilize the native software without the customization, then we are doing a huge disservice to the user. If the customization doesn’t work, and the user can’t work without it, then nothing gets done and it will definitely impede the workflow and the deliverable for the client. We are always looking for ways to speed up the process, because time is money and we want to get the project out the door on time or early, but at what cost?

IS THERE A DIFFERENCE BETWEEN PERSONALIZATION AND CUSTOMIZATION?

The simple answer is: absolutely. Most software users customize their toolbars, ribbons, and tool palettes to work in the most efficient way *for them*. Who amongst us hasn’t changed the keyboard shortcuts to work in a way that makes sense to us? Who amongst us hasn’t panicked when we upgraded and our shortcuts don’t work anymore?

Can there be over-personalization? Again, the simple answer is: absolutely. As a CAD/BIM Manager, I can attest that working on someone’s machine that has been over-personalized can be frustrating, especially if the user isn’t available to walk you through it. Sometimes over-personalization can cause programs to not work properly or even crash.

Am I against personalization? Simple answer: absolutely not. I do it with my software, but I still want people to be able to use my software if they need to. Remember when the ribbons were updated in Autodesk software and many people immediately reverted to the old style? Over-personalization can make the software unfamiliar to other users, much like the ribbons did when they appeared on that new install.

IS AUTOMATION A FORM OF CUSTOMIZATION?

Where does automation fall into this? Writing routines and scripts, using programs like Dynamo? Is this customization or is this a tool that helps the workflow? Utilizing automation to make your workflow more efficient is a good thing. Taking the mundane and assigning automation to it is beneficial as well. These tools were designed with the intent of helping the processes we have in place, not replacing them and eliminating the important part—the person behind the computer.

CONTENT CUSTOMIZATION?

When I think of content customization, I think of all the vendors in the market that supply content for use in models. I think of all the companies that produce lights, HVAC equipment, plumbing fixtures, and the like. I think of the disappointment when I can’t find anything but a 2D CAD or PDF of a family!

This customization is super beneficial to a project and really gives an owner a great expectation of what the completed project will look like. It also aids in the coordination of projects, when you



have devices that are graphically and dimensionally accurate so you know how tight you can make an area. Also, when the connections of these families are accurate, you know where your supplies and returns are coming and going. We need more customization of families and the like to be incorporated into a model.

CONCLUSION

This is a short article and just grazes the surface of customization. So what is the answer “to customize or not”? The answer is yes, to the extent that it benefits your process, your workflow, your client’s expectations, and your overall deliverable of a project.

To customize for the sake of customization isn’t a good reason. I believe that you must reap a benefit from the customization that has been sown in a tangible way so as to benefit the overall project and client. Remember, you could get run over by a bus and someone else is going to work on your computer, with your software on your project—make it so all can jump in and run with it. Think of the overall team and the process of the project so all parties can play well together. Until next time, happy customizing and collaborating!



Joshua Geimecke is the Technical Director of the Mid-Atlantic Region for EDGE-GTS, headquartered in Rochester, New York. He leads a group that specializes in BIM, IPD, VDC, and all facets of design technology. Joshua has been involved in the AEC industry, working in many different disciplines and sectors, for more than 18 years. He can be reached for comments and questions at jgeimecke@edge-gts.com.

Customization with 3ds Max

It is helpful to understand ways we can customize 3ds Max® where it makes sense to customize it for our needs. This article focuses on some of the ways that are helpful, regardless of the product we provide. I'll focus on templates, startup files, toolbars, and end on a note concerning content.

we collect and create. Additionally, with repetition, our abilities grow and we can improve and refine these templates. Over time, we collect a library of templates for a variety of scenes and settings that allows us to produce the highest quality content we can in a shorter amount of time.

Refer to Figure 1 where you'll see I set up a file for mechanical rendering that shares my favorite materials, render settings, some kitbash elements, and an environment for a presentation that includes lights, a surface plane, and camera. Now I'm able to start a

TEMPLATES

Preparing scenes with the proper environments and render settings is time consuming. With customized templates, we can store those

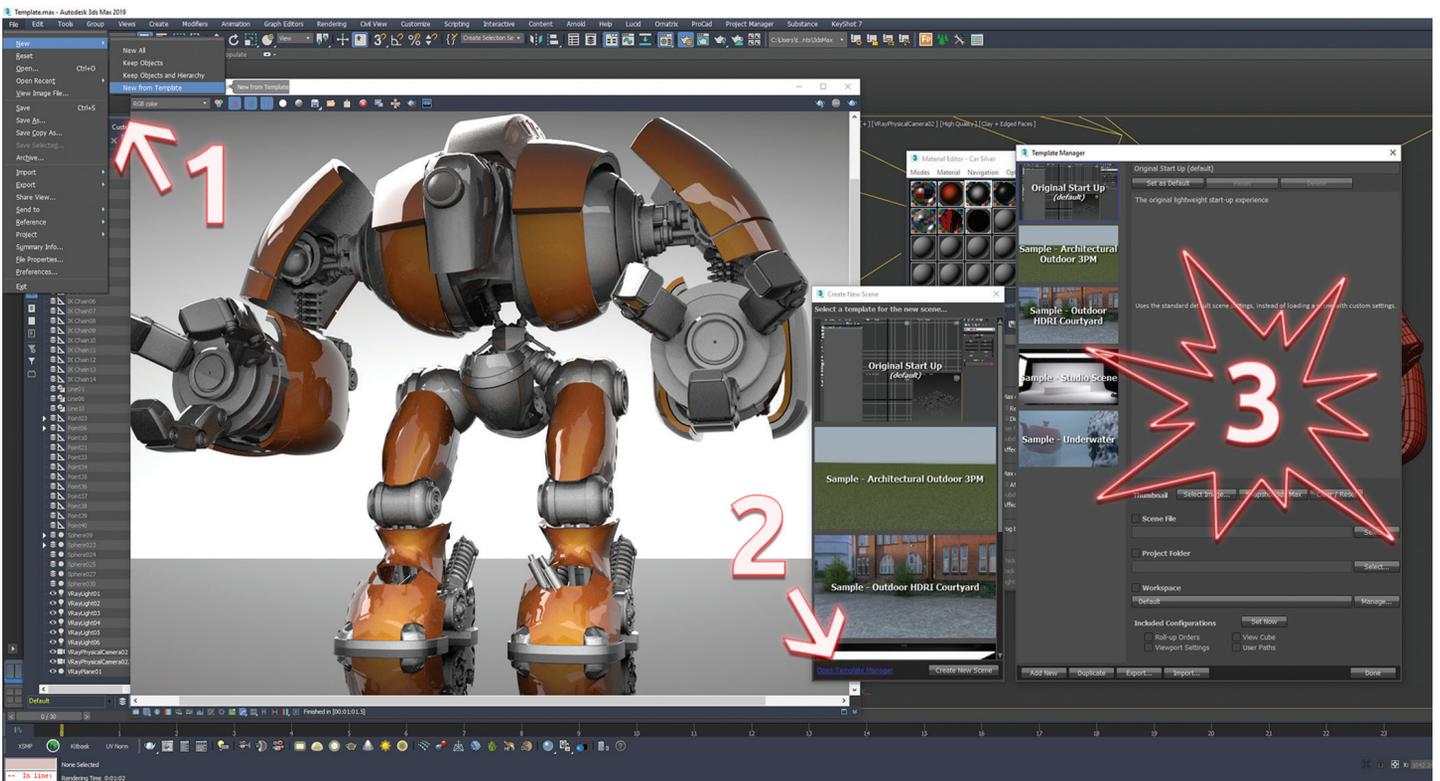


Figure 1: Add Template



Figure 2: Template examples

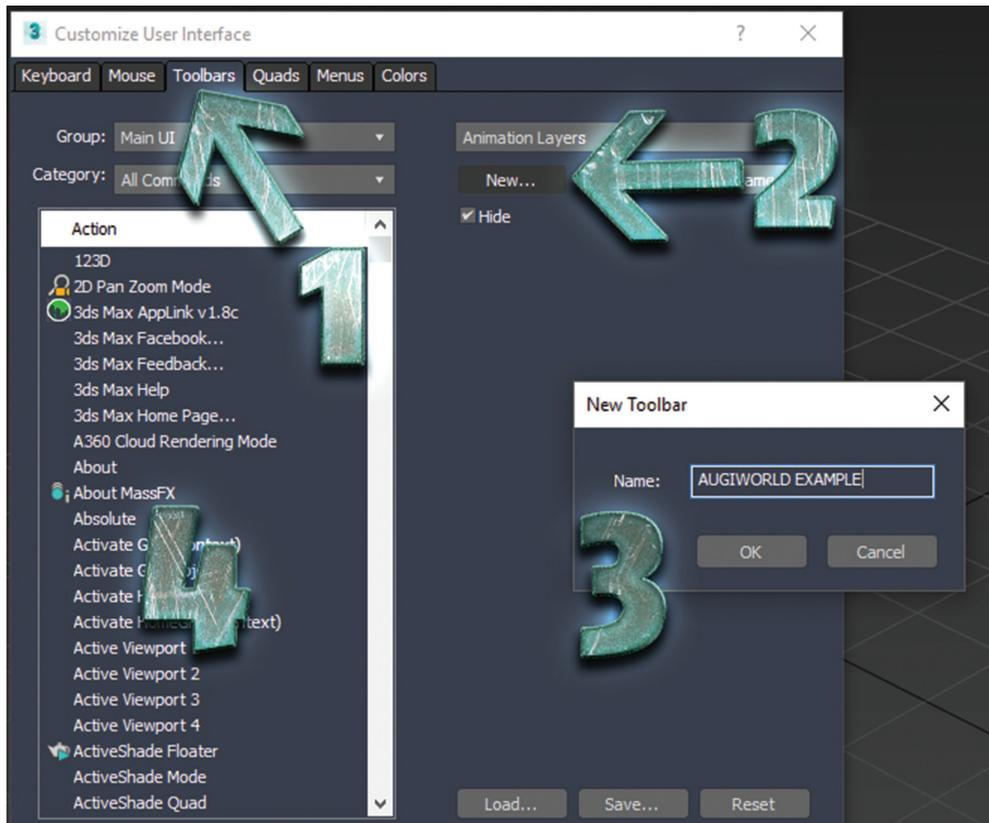


Figure 3: Creating a custom toolbar

project using this file at any time. The steps to generate a template are simple and marked in Figure 1. First, select the File Menu, then choose New From Template. Second, choose Open Template Manager on the Create New Scene palette. The third and final step is to fill out the information about the file you have open and then select Add New.

See Figure 2 for a few examples of templates I use to assist with the development.

CUSTOMIZE THE STARTUP

Customizing the startup file allows us to begin our 3ds Max sessions with preferred settings. For example, let's say we work primarily with Vray and wish to open 3ds Max to see our material editor already slotted with default Vray materials. We can do this by opening or setting up a file the way we prefer, then saving it in the MaxStart folder called "maxstart.max." You can locate the MaxStart folder by navigating to the Configure User Paths option in the menus under File > I/O Panel.

CUSTOM TOOLBARS

Creating custom toolbars in 3ds Max is an excellent alternative to access tools we use most often. Toolbar creation is simple. First, select Customize User Interface in the Customize menu. You can now create your toolbar following the steps in Figure 3.

Step 1, select the toolbar panel. Step 2, select the New button. Step 3, type the name of your toolbar. Finally, in Step 4, drag commands from the action panel into your toolbar. When done adding commands to the toolbar, select the save option at the bottom.

CUSTOMIZE CONTENT

Prepacked solutions gave us the ability to generate content quickly and efficiently. Advances in technology such as RT rendering in 3ds Max and Datasmith for Unreal Engine leave us only a few short years from real-time rendering solutions. The geniuses at companies such as Autodesk, Chaos, Pixologic, NVIDIA, Intel, and more have evolved the industry so far that in a few short years generating realistic content becomes as simple as playing a game of Sim City, leading to savings for clients and helping teams to be more efficient.

With all of this, there is potentially a downside to the automation that we've already started to experience. Generally speaking, content looks the same. While this is extremely efficient, many of us wish to avoid this. A powerful way to do that is to create custom textures and materials. Refer to Figure 4 for an example of some custom textures.

3ds Max 2019



Figure 4: Custom textures

Thankfully, there are programs built to help us generate these textures for 3ds Max. For this article, I'll present PixPlant. PixPlant allows us to select a picture (or existing texture file) and uses various algorithms to extract a color (diffuse),

displacement, normal, specular, and ambient occlusion map. Perfect for building materials in 3ds Max. See Figure 5 for example.

PixPlant gives us options to help manipulate the image so that it's seamless and repeatable and adjust each of the individual maps to suit our needs. As you dive into the texture-development world, you'll want to study more on the removal of lighting sources and shadows, the types of images to use, quality, and more, but for most cases, this software is a powerful way to help us generate unique and personalized content that satisfies our creative drive.

Ending on this note: remember that customizing our experience and tools in 3ds Max is useless if it's not leading to improvements.



Brian Chapman is an Autodesk Authorized Developer, creator of Pro-Cad.Net and a Senior Designer for an engineering firm located in Las Vegas, Nevada. Brian can be reached at procadman@pro-cad.net.

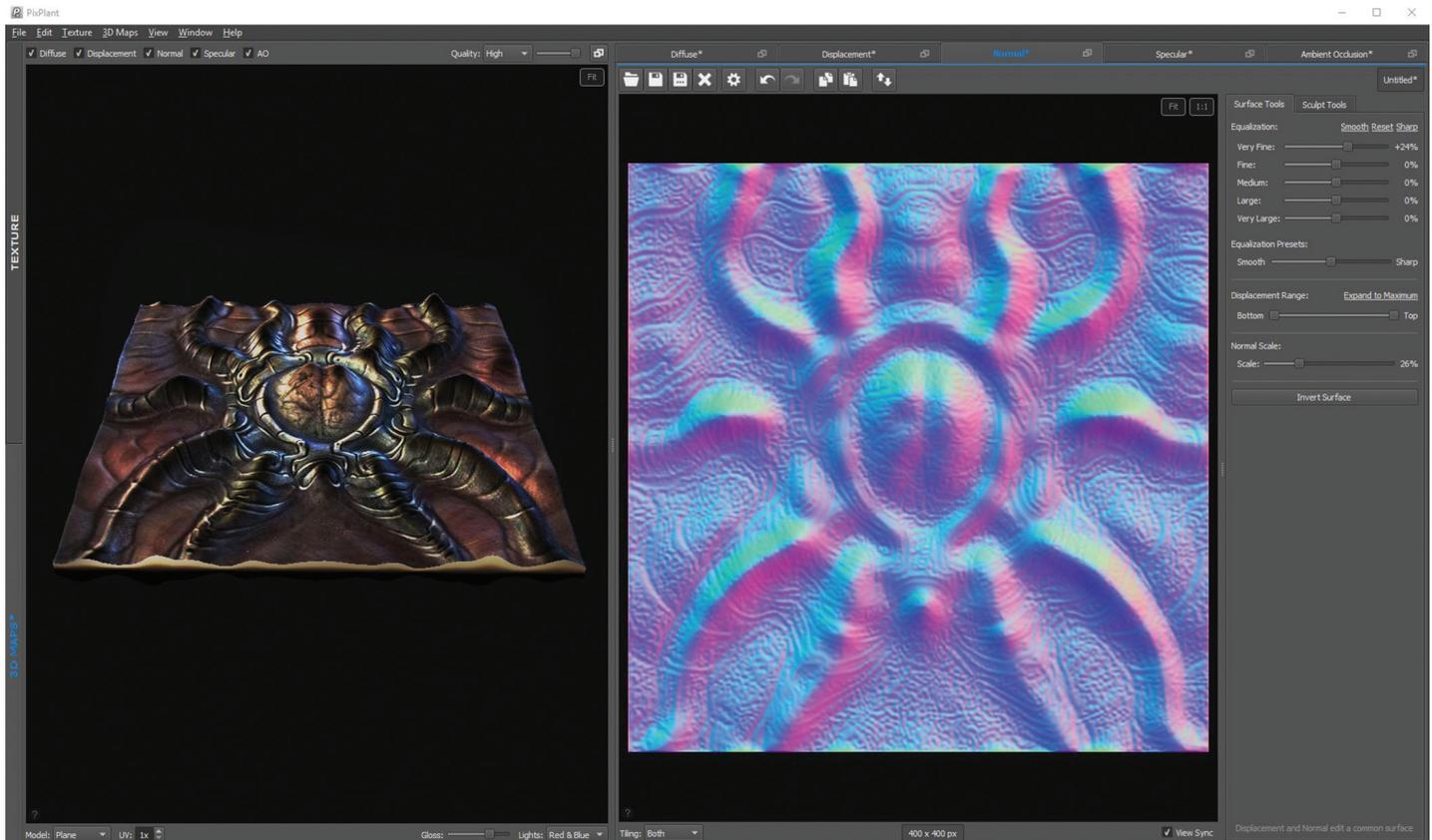


Figure 5: PixPlant texture creation

5.0GHz i7-8086K & QUADRO® BASED LAPTOPS



MTower™ 2P64X & MTower™ CX

The CX "*Blew Away*" the competition by nearly 100% on the AutoCAD® Render Test -Desktop Engineering. Now available with XEON® Scalable processors up to 22-Cores per CPU and with NVIDIA® Quadro® P2000/4000/5000/6000, GP100 & GV100.

PowerGo™

The PowerGo XT w/NVIDIA® Quadro® P3200/4200 & Intel® anniversary edition i7-8086K @5.0GHz TB, is the **fastest** and most cost effective CAD VR-Ready laptop in the market. Aggressively priced, the Slim & Light Xi® PowerGo laptop line starts at just **\$1049**.



WebRAIDER™ & NetRAIDER™ 64X

The most cost effective building blocks for converged storage, AI, simulation, machine learning computing solutions. 1U/2U/4U & 6U Rackmount with unsurpassed Scalability to 88 cores XEON, 2TB ECC and up to 8 NVIDIA® Tesla® V100 (Volta) PCIe or SXM2 NvLink®.



MTower PCIe

Award winning CAD desktop workstation designed to streamline the most demanding workflow. Quiet, powerful, compact, cost effective, now with the anniversary edition Intel i7-8086K, the **fastest 6-Core in the market clocked at 5.1GHz all cores & 5.3GHz top core speed**. Proudly USA built.

@Xi certified for 3ds Max, Adobe CC, AutoCAD, CATIA, Cinema 4D, Inventor, Creo, Revit, and SOLIDWORKS.



Our expert IT Architects will customize the **fastest workflow solution** for your application and budget.



www.xicomputer.com
800-432-0486

Destination Customization: Customized Solutions for AutoCAD



For a CAD manager, customizing software to better suit designers' needs can be such an exciting task. I am often asked for creative solutions to get the product we manufacture to function properly in software so our customers can easily specify it and use it in hydronic heating and plumbing designs.

One of the customized solutions I configured in recent years for my company's design team was an AutoCAD® MEP tool palette with pop-up menus. To do that, I learned how the Customize User Interface (CUI) Editor worked within AutoCAD. This article will show what I learned and, hopefully, inspire you to come up with

your own customized solutions for your design team no matter what AutoCAD product you use.

The first thing to understand is that the CUI Editor is a very powerful tool within AutoCAD. There are many components within it that help make up the end user experience. Knowing this, you can roll out your company standards within this end user experience.

The CUI Editor can create and manage the following customization file types: Main, Enterprise, and Partial. For the purpose of this article, I will focus mainly on editing an Enterprise customization

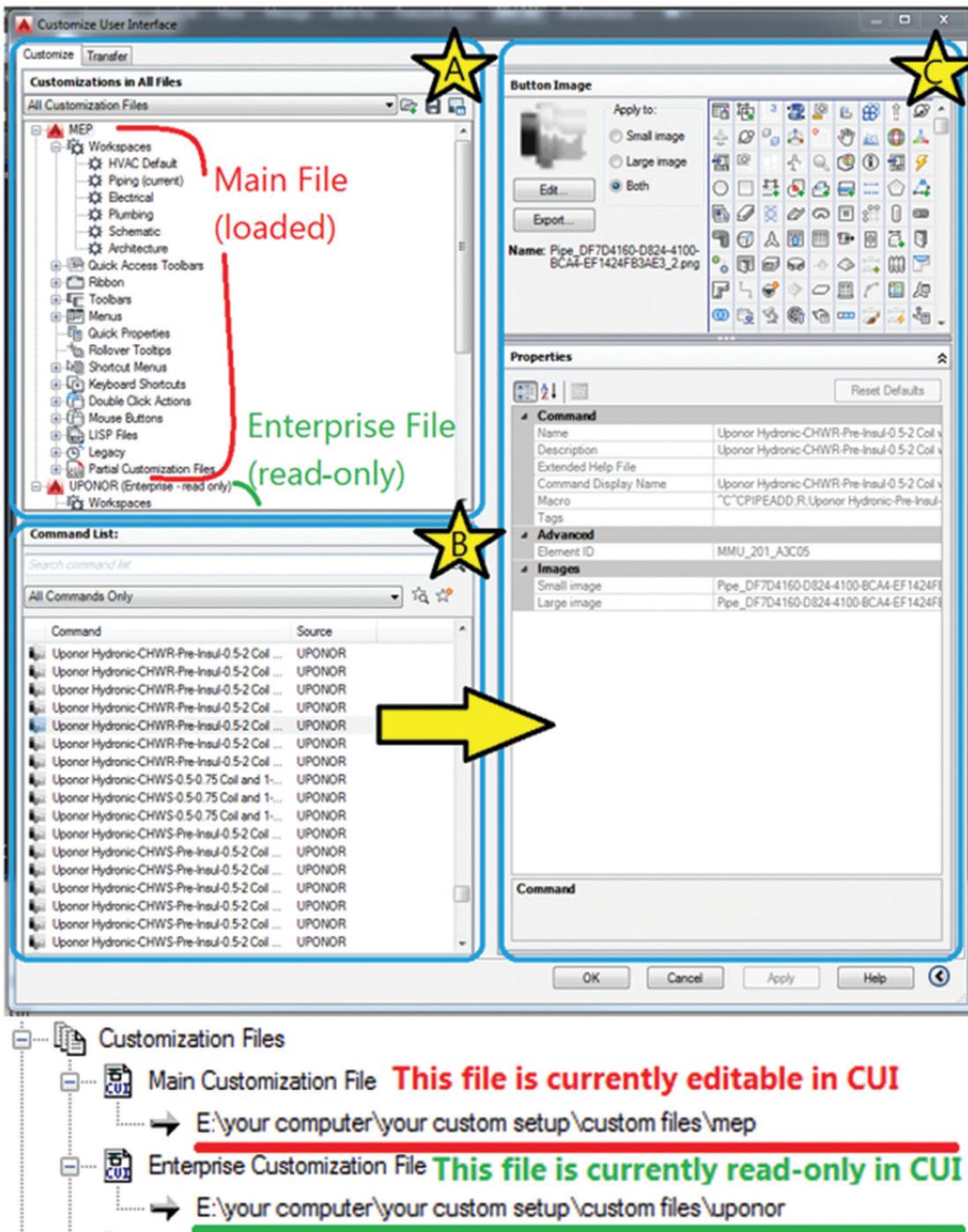


Figure 1: CUI Editor overview

file that will roll out the customizations. To access the CUI Editor, simply type CUI in the command line (see Figure 1).

A. This section displays CUIx files as well as a tree of all areas to customize. Figure 1 shows a Main CUIx file and an Enterprise read-only CUIx file loaded. If I want to edit the Enterprise file where all my customizations are, I need to designate it as the main CUIx in AutoCAD Options > Files > Customization Files as shown in Figure 1. In other words, I just browse out to the file in AutoCAD Options, so it becomes editable in the CUI Editor.

B. This section lists all the commands. It allows out-of-box commands as well as custom commands. You can drag and drop these commands into all sorts of menus, toolbars, etc. as well as tool palettes outside of the CUI Editor. Note that you can only drag and drop the commands in the CUIx file that is currently editable.

C. This section includes all the properties associated with any given command in your command list. They may appear grayed out if they were created while your Enterprise file was being edited (which is the case in Figure 1). However, when the fields are not grayed out and that CUIx is editable, they can be edited. When I create a “custom” command, I specify the following:

- + Name
- + Description
- + Command Display Name
- + Macro (what you want this command to do)
- + Image (you can pick existing ones or specify your own)

Now that we have an overview of the CUI Editor and its components, let’s look at how it affects the end user experience. See Figure 2 for an example of how the components in the CUI Editor make up the

Build panel on the Home tab within the Piping workspace that is set as current in the Main MEP CUIx file. Note that the example shown is within AutoCAD MEP, but the same concepts still apply.

Understanding the CUI Editor will help you recognize patterns so you can create your own ribbon panels, menus, toolbars, or anything else to suit your designers’ needs. Recognizing patterns of what is already built will help you provide customized solutions much faster than starting from scratch.

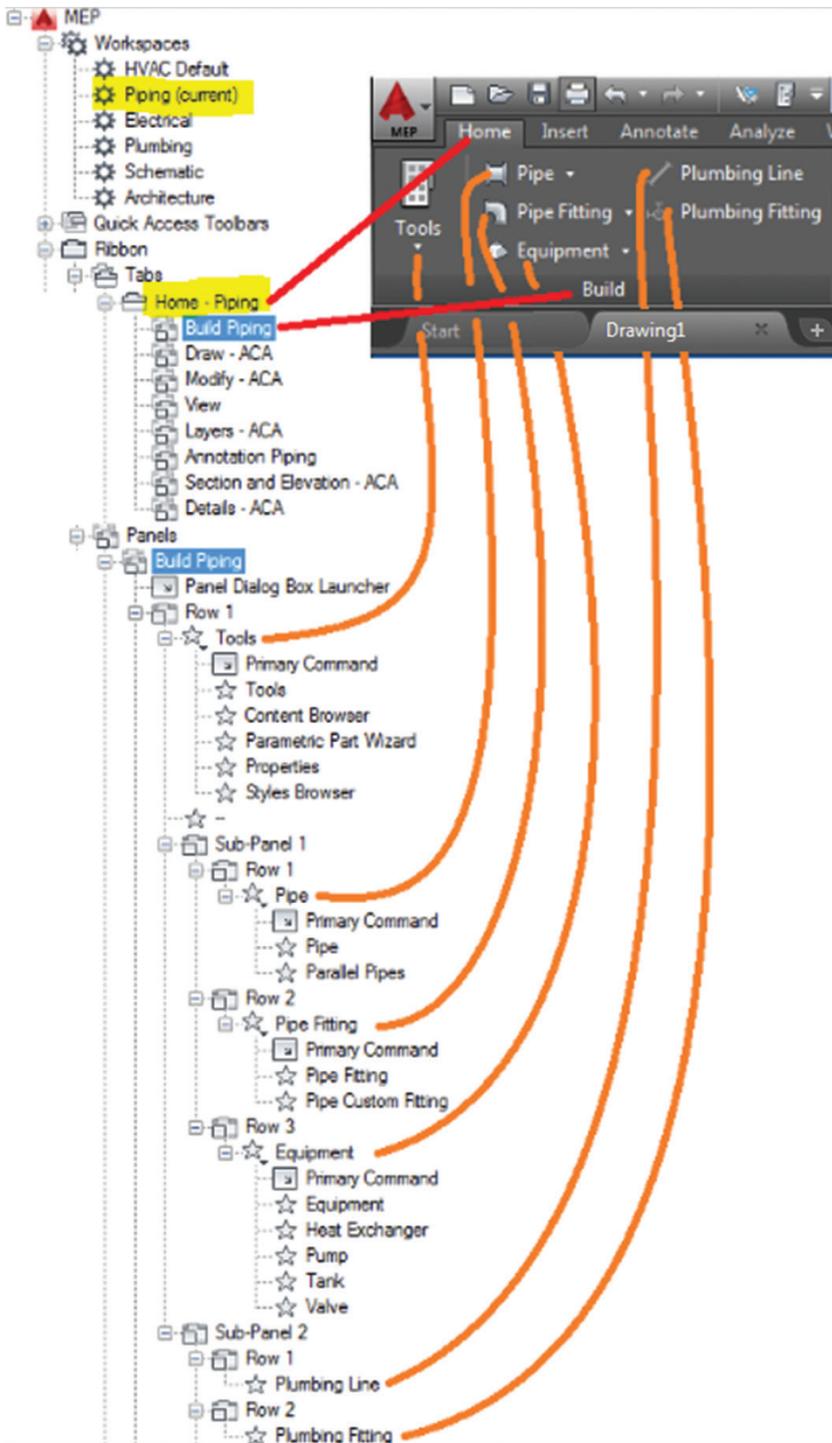


Figure 2: CUI editing example

Figure 2 shows how each tool or command is organized and grouped in the CUI Editor to appear a certain way in the ribbon. Commands are listed as stars; you can drag and drop from Section B to Section A and establish hierarchies of tools by right-clicking within Section A for different options (refer to Figure 1).

Sub-panels, rows, and line separators are just some of the tools that can organize the commands. Please keep in mind that your custom edits do not need to be this complex. This is simply an example of the power behind the CUI Editor.

Let's take it a step further and look at another way to customize the end user experience using the CUI Editor and a tool palette. Tool palettes are influenced by multiple file types to properly display. While there are various file types that can influence the look and feel of a tool palette, I will focus on a few types to get the ball rolling.

The first type of file is for the tool palette itself (.atc). All created tool palettes generate an .atc file in your AutoCAD Support Files > Palettes location, likely on your local drive. The second type of file is the tool palette group profile (.aws) that remembers all the tool palettes and the order of the tools within them. This is located in your AutoCAD Support Files > Profiles location.

The final major type of file is the master ATC file (.atc) that remembers all the tool palettes and all the tool palette groups. This file, which can vary by name depending on the AutoCAD product you are using, is located in the AutoCAD Support Files just outside of the actual Tool Palettes folder.

I don't modify this file in any way, but I wanted to mention it as part of the hierarchy. Other file types such as images (.bmp, .png), block drawings (.dwg), and more can all be used within tool palettes once you establish those first few tool palette files.

Refer to AutoCAD Options > Files > Support File Search Path for a general path to these previously mentioned support files. Depending on your AutoCAD product, the exact folder names for tool palettes and other items may vary slightly after that point. When in doubt, refer to AutoCAD Options > Files to verify Tool Palette File Locations and more.

To create a tool palette for the first time, you must first go into AutoCAD Options to create a New Profile to set as current. This might seem like an extra step, but I do this because I want to make sure the file locations that are specified in AutoCAD Options for these new tool palettes are correct and that the files are generating properly as I go.

I've spent many hours wondering why my new tool palettes weren't generating the .atc and .aws files, only to find out the file location I specified for these tool palettes didn't have writing permissions to be able to automatically write there. I'm mentioning this to save you some of the potential frustration if you decide to change the Tool Palette File Locations in AutoCAD Options > Files to be something other than the out-of-box location.

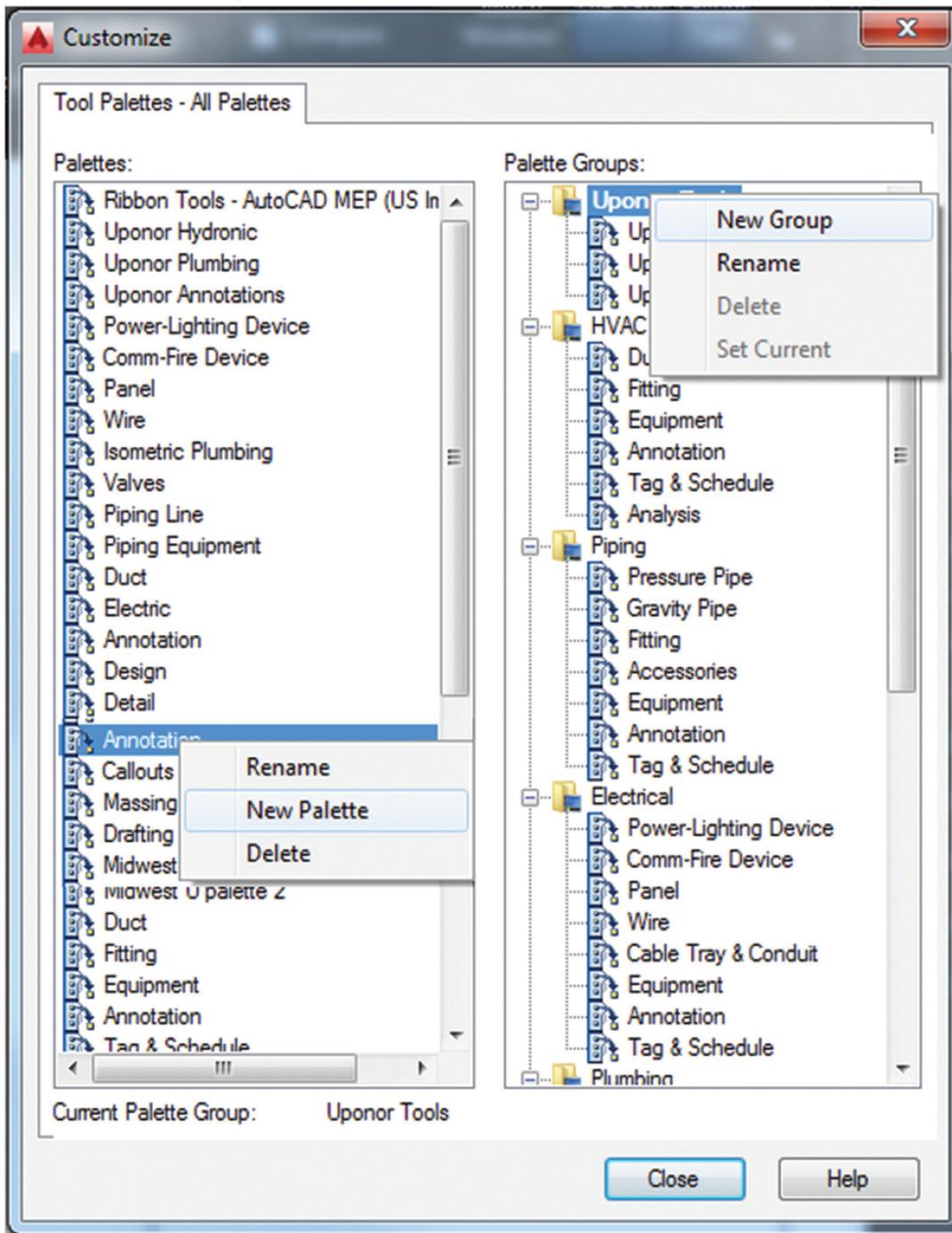


Figure 3: New tool palette

Once you confirm your Tool Palette File Locations in AutoCAD Options, type `TOOLPALETTES` in the command line and right-click on the current palette to go to Customize Palettes where you can create a New Group and a New Palette (see Figure 3).

It's important to name them right away because these tool palette files should now be generating in your AutoCAD Support files. Confirm that they are showing up in the locations you specified in the Tool Palette File Locations in AutoCAD Options. If you ultimately see `.atc` files and `.aws` folders named the way you intended in those locations, you are golden. Then the fun begins.

At this point you may set this new tool palette group as current within the Customize Tool Palette window. From there you will have a blank slate where you can do any of the following:

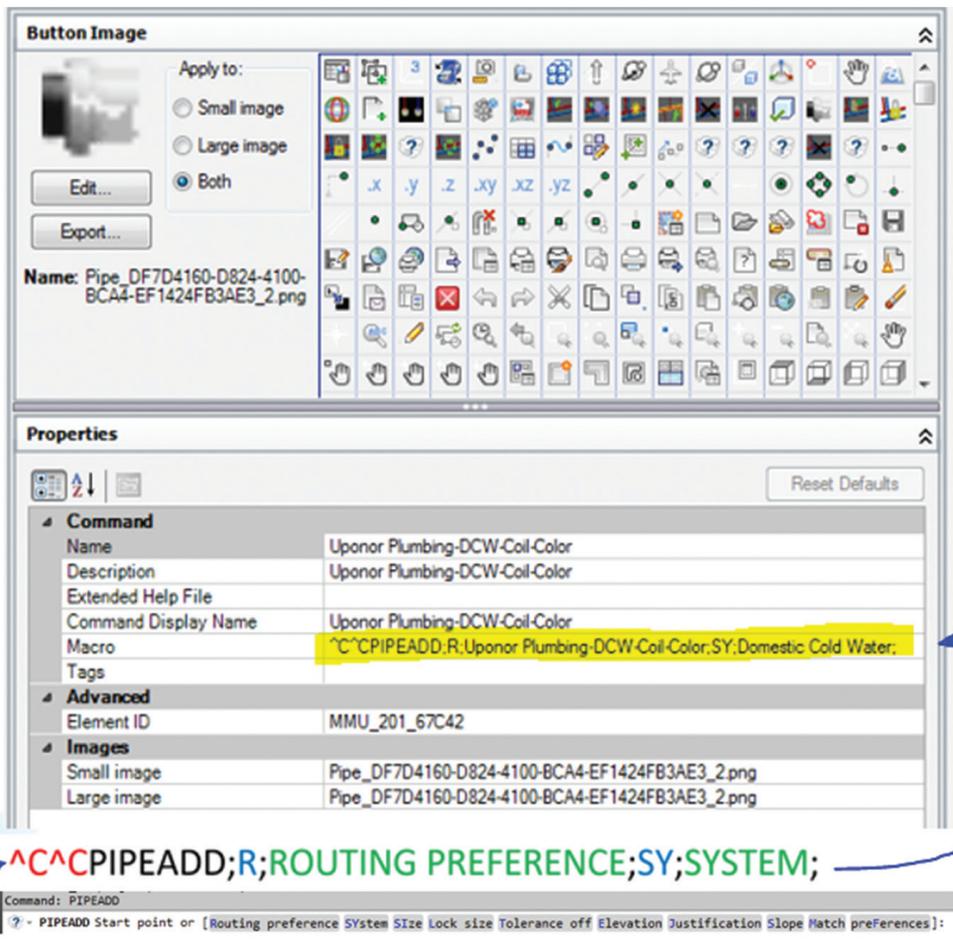
- a. Drag/drop drawing blocks to your tool palette.
- b. Drag/drop commands from CUI,CONTENTBROWSER, or current drawing into your tool palette.
- c. Configure macros in commands and add to your tool palette.
- d. Add documents to buttons in your tool palette (i.e., User Manual or Company Standards) via the tool palette button properties.
- e. Create custom images for your tool palette buttons.

For the purpose of this article, I will focus on command macros that ultimately create a pop-up menu within the tool palette. I did this for my company's designers because we were utilizing many different routing preferences and systems for pipe drawing with our product within AutoCAD MEP. Even though this article will show that specific example, you can create macros and pop-up menus for any selection of commands you'd like to neatly organize in a tool palette.

One way to create a command macro is to hardcode one in within the CUI Editor. Be sure to use proper syntax and pay attention to the different options you already specified when using commands. You can find a table of proper syntax for macros when looking up the help files (F1) within AutoCAD itself.

See Figure 4 for an example of a command macro I created based on what I saw in the command line. I essentially specified that I wanted the `PIPEADD` command to engage, and then I specified the routing preference and the system I wanted the command to draw with.

AutoCAD 2019



These things I specified show up in the command line as highlighted letters, just like any other command that has options for you. The whole purpose of macros is to help automate commands, so you don't have to keep specifying and typing those commands out each time.

Once you have written some macros in newly created commands within the CUI Editor, you can then drag and drop them from Section B to Section A under the Menus area (see Figure 5). You can use line separators to create a cleaner and more organized look within the menu as well.

Right-click to see your options. Once you build your menu, look at Section C to assign an alias for it. This alias will be used to call the menu in a DIESEL expression to ultimately make all those command macros pop up in the properties of a tool palette button.

Figure 4: Creating a macro

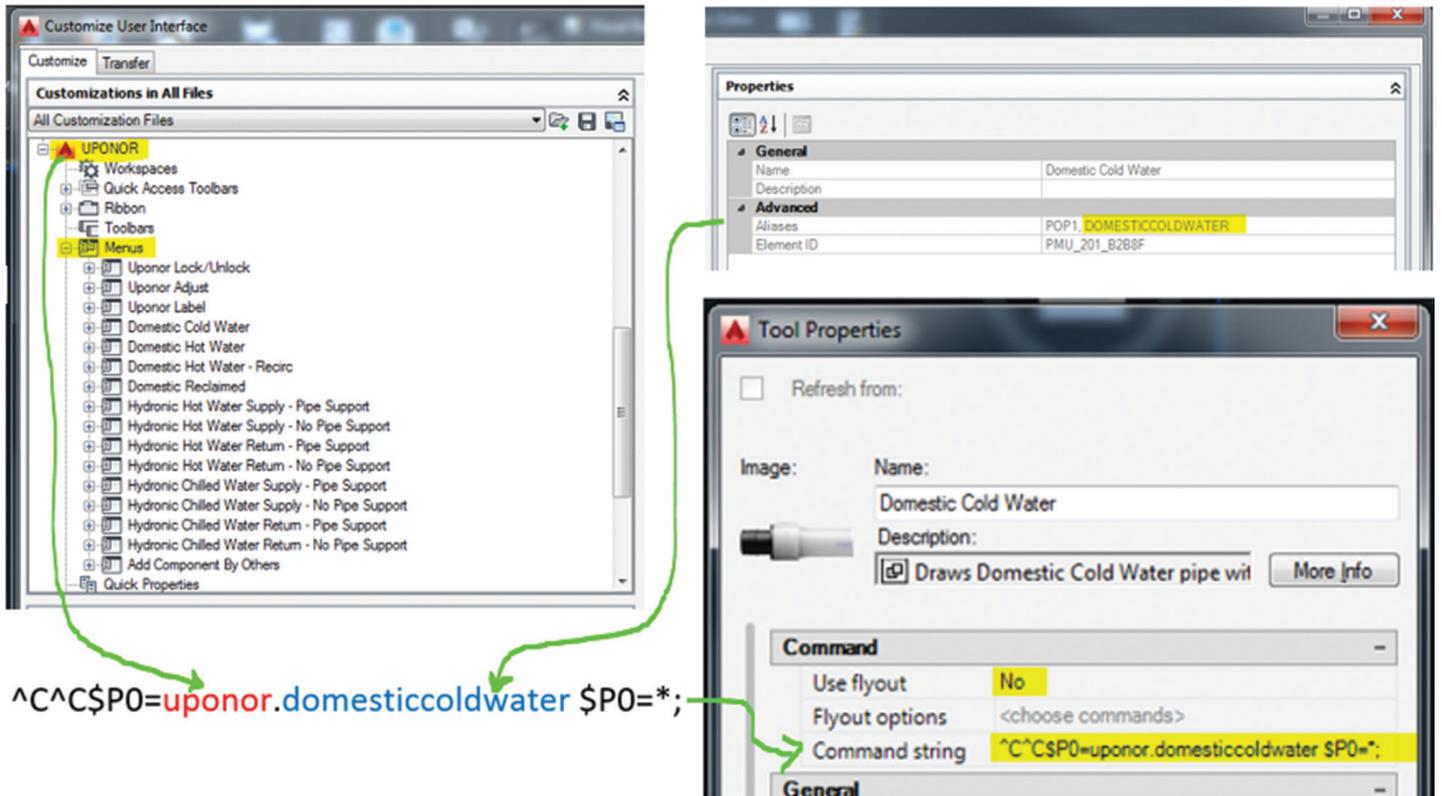


Figure 5: Building a menu

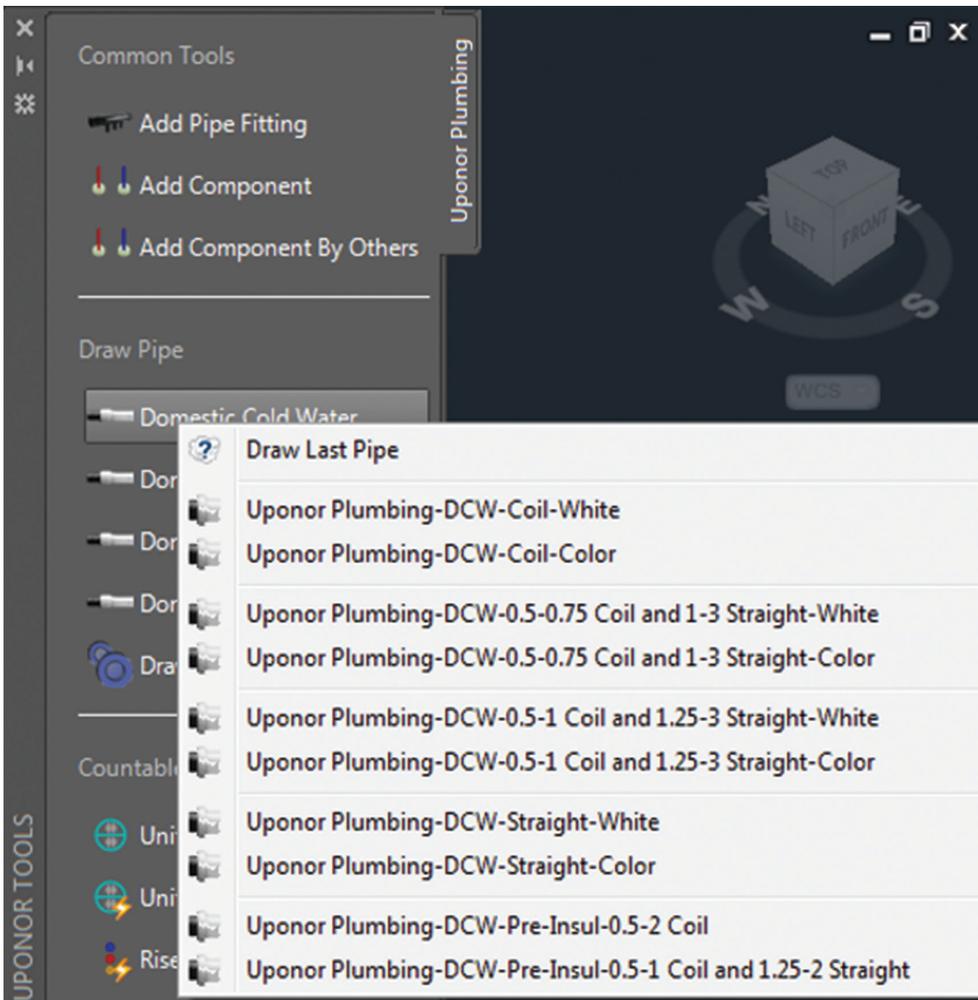


Figure 6: Pop-up menu in the tool palette

Now it's time to put it all together. To review, we created commands using macro syntax and placed them under a menu in the tree of customizable options in the CUI Editor. We then spelled out the alias of that menu so we could eventually put it in the tool palette to make that menu pop up with all those commands.

For the last step, we'll specify the DIESEL expression that calls this menu in the tool palette. Go to a tool palette button on the tool palette itself and right-click to get into the Properties. Specify the highlighted settings in Figure 5 (and modify to suit your needs).

While DIESEL itself is a big topic all on its own, the point is that it is specifying a menu listed under a certain CUIx file. For my example in Figure 5, "Uponor" is an Enterprise CUIx file I made editable and "domesticcoldwater" is a menu I created in the CUI Editor with several different commands within it.

Type out the expression with characters and spaces as shown, and you will then have a pop-up menu in the properties of one tool palette button. See Figure 6 for a final result of building a tool palette, creating some command macros in the CUI Editor, putting those commands in a menu under an editable Enterprise CUIx file, and lastly, making that menu pop up in just one of the tool palette buttons.



As I mentioned in the beginning, customizing software to suit designer needs can be very exciting. Creating solutions for our designers has been very rewarding for me as a CAD administrator. My hope is that these brief examples will help you expand your horizons and inspire you to come up with ways to address the needs of your designers.

Before I wrap this up, I do want to mention that multiple files need to be carefully deployed so everyone can see these new tool palettes and other customizations. Please check out my article "Seven Songs about Scripts" in the July 2017 issue of AUGIWorld magazine to read about ways to deploy all these different files and customizations to your designers. Happy customizing!



Jisell Howe, CDT, is the CAD Administrator for Uponor, a PEX pipe system manufacturing company located in Apple Valley, Minnesota. As an AutoCAD certified professional, she manages several internal and external product/content databases and supports the software needs for 40 designers in the company's Design Services department. Jisell holds a Bachelor of Science degree in Applied Management as well as an Associate of Applied Science in Architectural Drafting & Estimating from Dunwoody College of Technology. She is a returning speaker for Midwest University, a regional professional development conference featuring Autodesk® software. Jisell can be reached for questions and comments at jisell.howe@uponor.com.

Risers and One-Line Diagrams: Not Just a One-Way Street



The theme for this month’s issue is customization. This can mean different things to different people. It could be as straightforward as reviewing the options and features provided with the software to flex to your way of working. For example, things such as modifying the user interface, keyboard shortcuts, quick access toolbar, etc; a sort of tips and tricks.

Another common form of customization is extending the functionality of Autodesk® Revit® via the API. This is perhaps what most people think of when the topic is customizing Revit. There is no shortage of great add-ins, macros, and Dynamo scripts to customize Revit—achieving things the software can’t do out of the box, but using the information already contained in the model. If you can’t find what you need freely available or for purchase, there is an active community that can help you build your own.

A third type of customization is the infamous Revit “workaround.” These are the contrived workflows to achieve a desired result that the software either doesn’t support at all or not well enough. These usually involve either taking advantage of a bug or anomaly in Revit or using a built-in feature in a way that wasn’t exactly its intended purpose.

In the September 2018 issue of *AUGIWorld*, we discussed a specific type of workaround for legends—an often overlooked but essential tool when creating construction documents. We covered the basic purpose of a legend, looked at the built-in functionality provided with Revit to create legends, and discussed alternatives when the provided tools may not meet your needs.

Building on that article I want to review another contentious issue for those on the engineering side of the fence: risers, one-line diagrams, and single-line diagrams, etc. They have many names and slightly different goals, but the basic idea is the same: they are a 2D schematic or diagrammatic depiction of a system’s design. By definition this differentiates them from plan drawings because routing information is not included and not all connections are necessarily shown. Or, in some cases, more information is included that is not shown on the plans.

I think most would argue that risers and one-line diagrams are technically different. A riser is used to indicate connections of a system as it travels vertically through a building, perhaps only displaying the major components. In an HVAC riser, for example, while showing connections between equipment across levels, the more numerous connections to air terminals are usually not included.

A single-line diagram, by comparison, is most commonly used by electrical trades to indicate connections between equipment and various components. They graphically depict the flow and electrical data of the system without necessarily indicating the location of the components.

Plumbing also has its version of risers or isometric drawings indicating connections to fixtures. These typically provide and show information that is difficult to indicate in plan view. With careful planning and implementation, a 3D view or views can be used to achieve an isometric directly from the model.

As with our previous discussion of legends, fundamental questions should be asked when thinking about risers and line diagrams. Does the diagram need to use information from the model, reducing duplicate work and data entry? Or can the diagrams be more “typical,” not necessarily having to stay coordinated with changing information in the model? Having answered these questions, this article will investigate some of the options available in Revit for engineering designers.

At this point it is also worth asking an even more basic question: what role do these diagrams play in designing engineering services for a building? Should the riser or one line summarize what is in the model or should it drive what is input into the model? In other words, what comes first, the diagram or the model?

In my opinion, Revit is more of a modeling and construction document tool than an engineering tool. It does not natively allow for driving the model from diagrams. But that doesn’t mean it isn’t possible. Via the API or even Dynamo, a lot of data and automation can be pushed around. There are also third-party solutions that both extend the engineering design using information from the model or are able to drive the model from the information and layouts performed in their software first.

Electrical (28 systems)			
Communication			
AMP1	AV/STORAGE	1014	
1			700'-4 219/256"
2			511'-2 23/128"
3			578'-7 105/256"
4			695'-6 13/16"
AMP2	AV/STORAGE	1014	
AMP3	AV/STORAGE	1014	
AMP4	IDF	2042	
AMP5	IDF	2073	
AMP6	LARGE CONF	3042	
AMP7	SM CONF	3075	

Figure 1

Revit 2019 – MEP

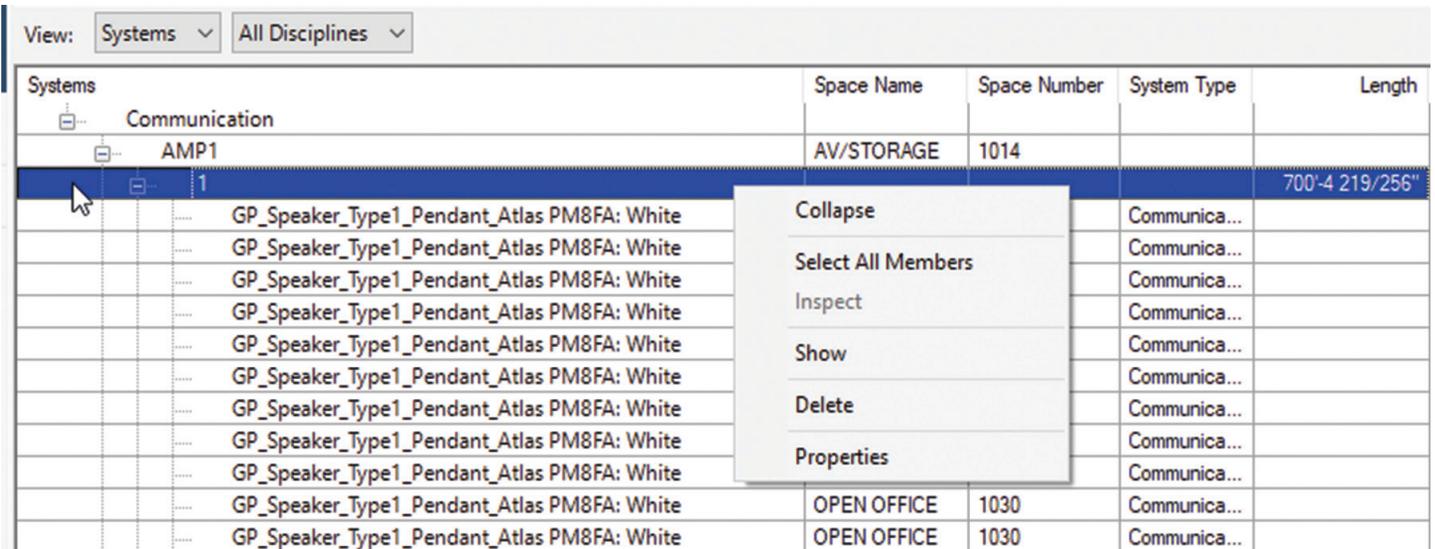


Figure 2

Still a summarization of what has already been modeled and assigned to a system, Revit has what is called the system browser (and system or circuit schedules to a certain degree – Figure 1).

The system browser is helpful for basic tasks like seeing a tree view of connected items, isolating and editing elements on a system, and finding elements not assigned to a system (Figure 2).

Sadly, its usefulness stops there. All that information available for assisting in creating diagrams! Understandably, risers and diagrams quickly get complicated when considering the myriad standards and requirements each company, discipline, and permitting agency may have. However, I believe it can be framed another way as well. Revit itself provides the technology and tools to create models and construction documents, but leaves many of the “last mile” decisions such as symbols, appearance, etc, up to the user. The same approach can be used on the system browser with risers and line diagrams. The underlying technology and information is already there in the system browser—we just need a few more tools to assist the user in going the “last mile.” This is an area I hope to see explored.

So we’ve concluded that Revit doesn’t provide a way to start with a diagram and drive the model from there. We’ve also concluded that the system browser won’t help us much in summarizing what is in the model by creating risers or line diagrams. Where do we go from here?

One approach is or was to continue drawing the riser or line diagram in AutoCAD® or other software. This information was then linked in as a DWG to a Revit drafting view. All the standard symbols were already built and it was a tried-and-true process. Why reinvent the wheel?

I see the above approach as a stepping stone to the next option: creating the diagram in a drafting view in Revit. After all, Revit can draw lines, text, and symbols just like AutoCAD, so why not keep

it all in Revit? True—detail items, tags, and generic annotations need to be created, but once complete there is a lot to gain from this approach as opposed to continuing to link in DWGs. Parameters, tagging, and even schedule-specific views or elements are a few examples, not to mention eliminating the hassle of opening and modifying the information in another piece of software and then having to reload, all just to see a change.

It should come as no surprise that the above options are not using actual model information. All that parameter and system information from those model elements, but no way to get to it for a diagram. What a shame! Remember those fundamental questions we raised earlier? If your riser or diagram is more typical in nature—not indicating actual element properties or system information from the model—then a drafting view is a good choice.

However, what if you do want model information to be coordinated with the diagram(s) in your drafting view? Obviously, you can do it manually. Had to renumber your chillers or air handlers? Don’t forget to do it on your riser. That’s no fun. This is where customization is required.

Still making use of drafting views there is an approach that can help automate this process. With the API or Dynamo, it is possible to create parameter relationships between elements. I personally use a paid add-in for such purposes. Once the relationship is established, any change in parameter values in either the model or the drafting view updates the other.

If you are fortunate enough to have an in-house person or department capable of programming this functionality into an add-in, macro, or script, the features can be even more automated and customized to your company’s workflows. This approach perhaps requires the most time to implement, but the returns can be fantastic. I’m a big fan of preservation of data and minimizing duplicate data entry. Just think, once in place, no more chasing your tail around trying to remember where to update information.

This gets us to our last “type” of customization: workarounds. The dilemma here most often boils down to these two points: 1) All the information needed for the riser or diagram is in the model; and 2) The technological know-how to coordinate this in a drafting view is beyond your abilities and time limits.

The first workaround option is to create the riser or diagram in the model. Think about it—all the information is in the model. Why go through the effort of getting that information into a drafting view? A drafting view, by definition, is not tied to the model. So rather than bringing the information to the drafting view, we are bringing the graphical elements (lines, tags, detail items) to the model.

This approach has been around for a while and is well covered in previous AUGI publications. As such I will outline the basic steps but not go through the process in detail. The basic premise is that the information is in the model. We just need to display that parameter information suitable for the riser or diagram by using tags. What is needed then are tags created just for this purpose. They will include the parameter information we wish to display as well as the symbols and graphics we need to use.

If a riser is the desired result, an elevation or section is a good choice for the type of view to create for this purpose in the model. This way you can see levels, floors, even ceilings, if desired, as well as spaces or rooms. If level or floor information is not required, technically any model view type should also work.

In order for this approach to work, all model information needed in your riser or diagram must be visible in your view. This means check to make sure your view crops and offsets are not excluding any elements you need.

Because the model elements should not be moved, risking your plan views, the flexibility required to make the riser or diagram relies on tags. Tags can be moved independently of their model

elements. Beginning with version 2017, tags can now be pinned and will not move even if the model element host moves. This enhanced functionality makes this approach much more attractive compared to previous Revit releases.

No riser or diagram is complete without lines to indicate the relationship between elements. Lines can be drawn in model views just like a drafting view. Keep in mind, however, that because the elements are tags we will not have snaps to help us snap the lines to the tags. Further, if these lines need to also “carry” information, perhaps about the system or circuit, line-based detail items can be used. These can hold information in parameters for tagging, can also be used by Revit keynotes, and can even be scheduled.

Lastly, because this is a model view it probably contains information we don’t want to see in our riser or diagram such as links, datum, and family geometry. If we don’t want to see most if not all of the model elements, we will need to control their visibility. Controlling the visibility of links and datum elements is easy. However, turning off visibility for model elements, either by turning off a category or using a filter, also will make the tag for said elements not visible. The solution is to override the color of all elements that need to be not visible, changing their color to white. This keeps the element from printing or plotting but keeps it visible so that the tag(s) also remain visible (Figure 3).

Once all view settings have been changed and configured as desired a view template can be saved for easy re-use.

Don’t forget this is a workaround—using functionality for something other than its intended purpose—so it is not without its drawbacks. First, as I already mentioned, inputting lines between tags does not offer snaps to help with alignment and appearance. The information is preserved at the expense of less graphical consistency.

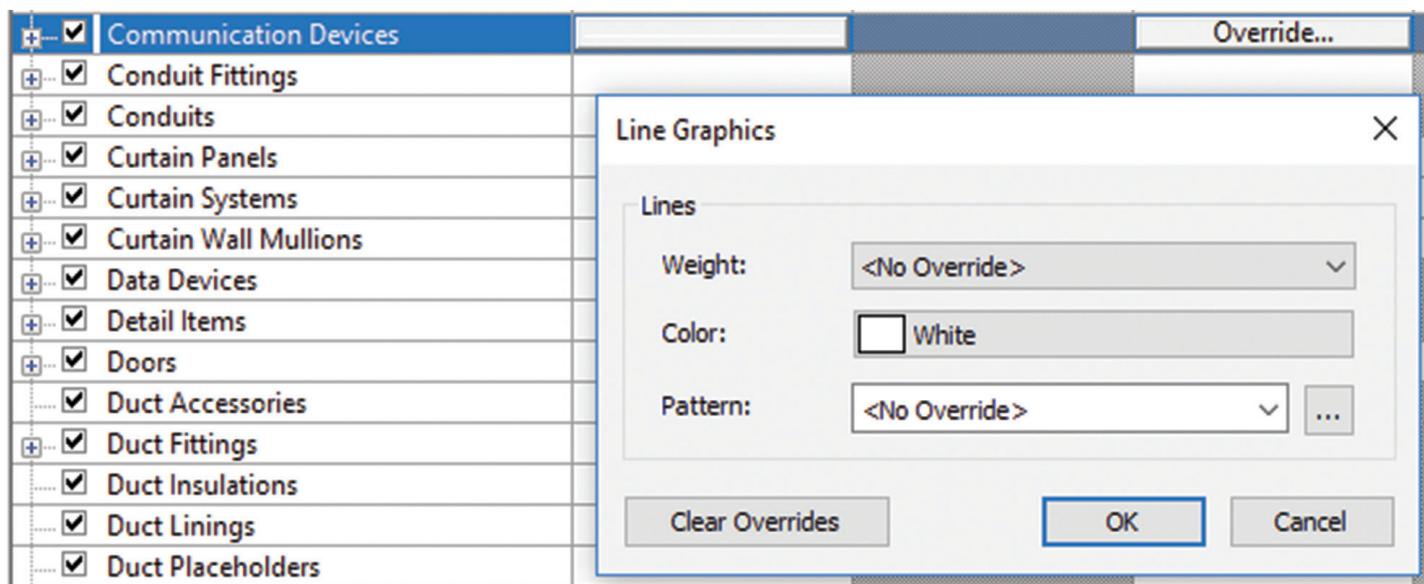


Figure 3

Revit 2019 – MEP

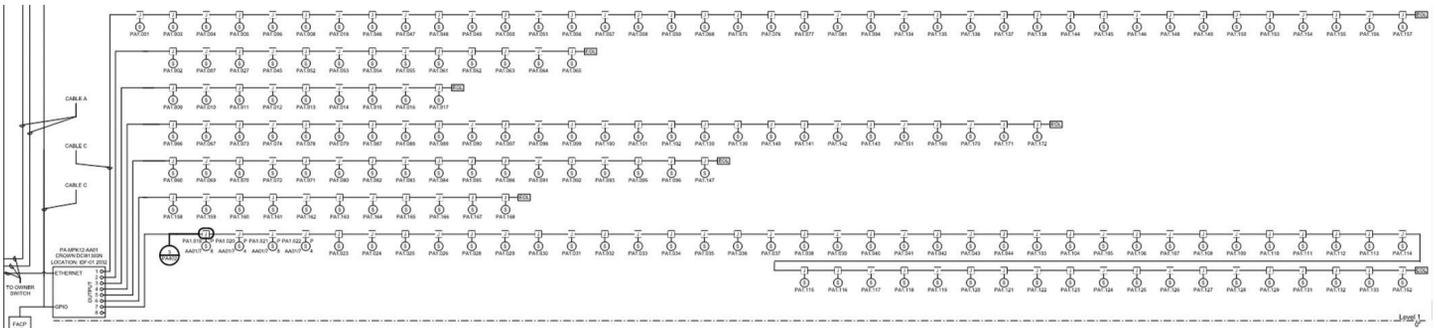


Figure 4

Second, the tags, with their desired parameters and graphics, must be created for just this purpose. The danger that creeps in here is when different symbols are needed for elements of the same Revit category. Nothing is preventing the user from tagging an element with a tag using the wrong symbol. Or, if during the course of design the element changes types, the symbols in plan view also change. The symbol in the tag in the riser or diagram will then be incorrect. This is not a big problem if your tags are not indicating different symbols.

Third, once tagged, all the tags must be manually moved to their desired locations. This can be tedious depending on the number of elements. Once located as desired, don't forget to pin all your tags!

Fourth, the scale of the view must be such that it will fit on a sheet. Decide this sooner rather than later to avoid having to adjust annotative elements if the view scale changes (Figure 4).

Fifth, but probably not last, is that this works well for risers or diagrams depicting major equipment connections of a system. But what if more elements are required than just the major connections? For instance, on a security design project, hundreds of elements are to be included in the riser, indicating device information and panel termination location. You may ask why that is even necessary, considering all that information is most likely already on plan or can be easily displayed in a schedule. To that I would say, "your words, my sentiment." I would completely agree with you. This article would be over. And that's not happening.

The above requirements are daunting. Either way you look at it, whether using a drafting view with parameters linked to model elements or creating a modified model view to serve as your riser or diagram, it is an arduous task. It is a regurgitation of information displayed differently. We needed another solution.

A coworker recently had a brilliant idea that we have now used on several projects. Making device schedules in Revit is as easy as pie, right? We already use schedules with images for our legends. The next natural step then is to make a schedule to be used as the riser!

Under the right conditions, using schedules this way can dramatically improve the riser creation process. Just like tags in modified elevation views or "smart" drafting views, parameter information is always up to date. However, an advantage is that it

removes the need to manually place tags or detail items and order them, sometimes sequentially, as needed. The formatting abilities of schedules assist in standardizing appearance and alignment. Elements can be easily filtered, sorted, and grouped (Figure 5).

Once placed on a sheet, a schedule can be split, now allowing for dynamic column control and arrangement. The columns of the split schedule can be resized as needed to accommodate size restraints of the riser or sheet itself. A single schedule can be used, or another option is to use several schedules filtering by level, for example (Figure 6).

It is not a perfect solution, however. Because schedules can only be placed on sheets, any required lines must be drawn on the sheet directly. If information needs to be added to these lines, you must resort to text or generic annotations.

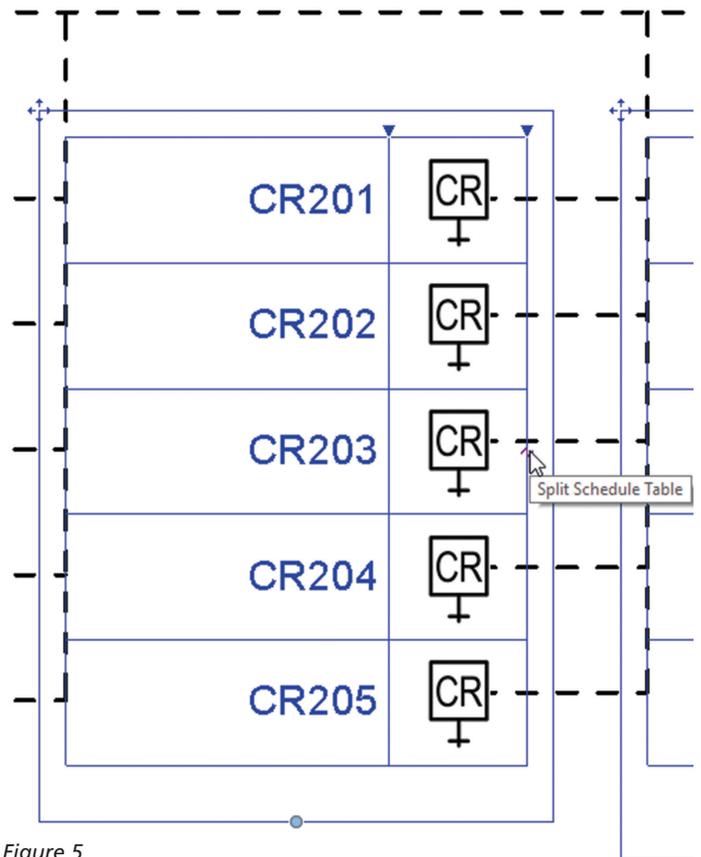


Figure 5

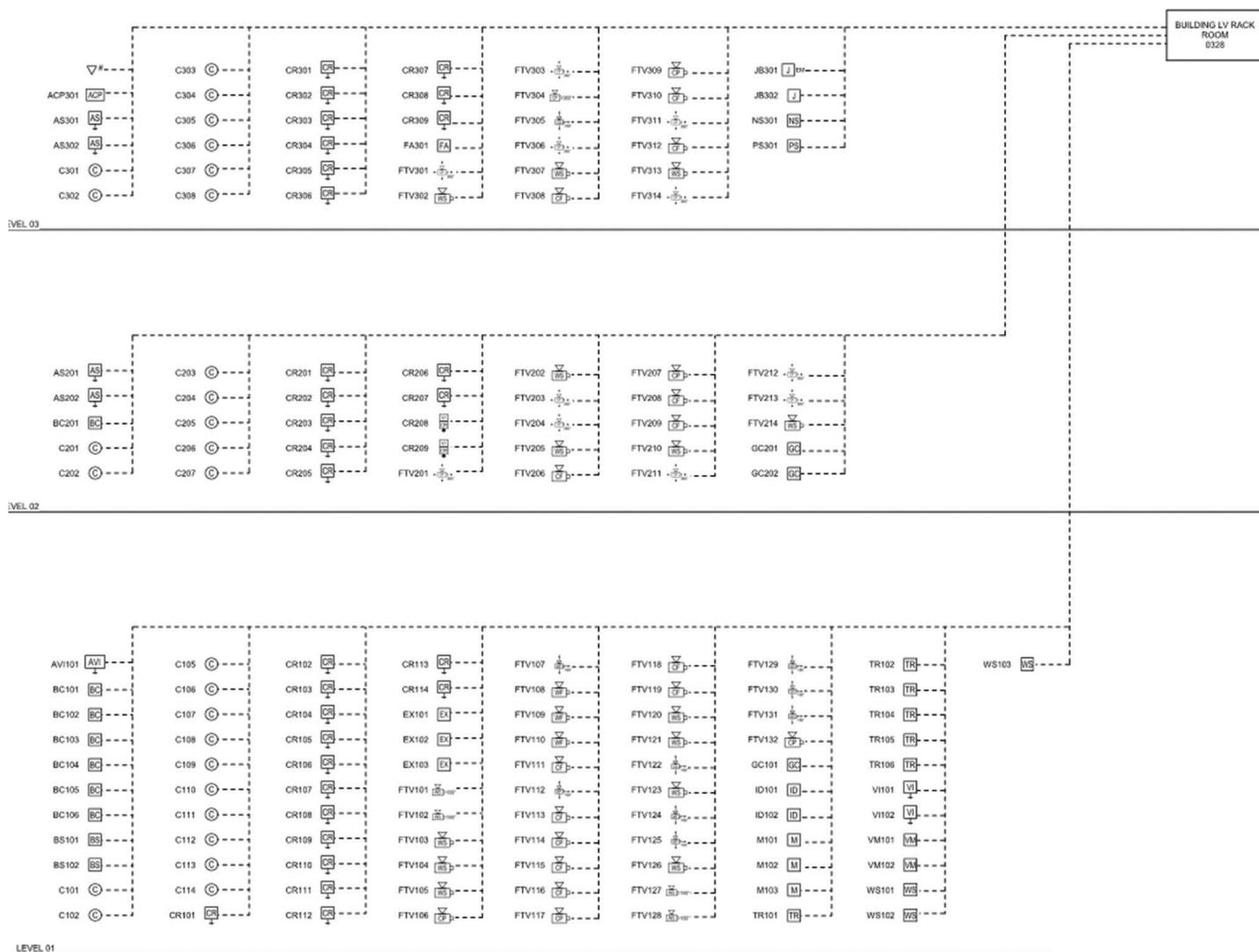


Figure 6

A possible alternative to the limitation of detail lines, one I have not personally tested yet, would be to still create a drafting view where line-based detail items can be input. By placing the drafting view on the sheet, overlaying the schedule, and working through the viewport of the drafting view directly on the sheet, it may be possible to get the benefits of both worlds. This would allow for parameter information, keynoting, and tagging of the lines, but would rely on the schedule for the bulk of the information.

Were schedules intended to be used in this way? Probably not. Does it work? Absolutely. As long as we are producing construction documents, we will most likely have to continue issuing risers and line diagrams to convey information. Furthermore, as long as we continue to utilize software for those purposes, there will be the need for customization. If the tools provided don't meet a need, we improvise by creating our own, adding more functionality to what is already there, or finding workarounds.



Nathan Mulder has more than 10 years of experience in the AEC industry. He is currently the BIM and CAD Manager for Guidepost Solutions, a global leader in investigations, compliance, and security consulting, offering design services for security, telecom, and technology systems. A Revit MEP Electrical Certified Professional, Nathan is always looking for ways to fully leverage software to improve the project design and management process. Contact him at mulder.nathan@gmail.com or on LinkedIn.

Uninstalling Autodesk Software? Let's Save You Some Time!



Increasingly, especially with Autodesk Industry Collections giving users access to 20+ applications, it's not uncommon to have two or three versions of 10 or more Autodesk® products installed on a typical workstation. And each one of those products has language packs, libraries, enablers, add-ons etc. This can result in dozens of installed Autodesk applications.

Installing the software (an article in and of itself, for another time) and eventually uninstalling can be a big task. Even uninstalling one release year of those products, when done manually, could mean running through 30 or more uninstallation wizards.

This article will guide you through making this process much easier and faster, and with less work. Whether you are uninstalling just one Autodesk application, all applications of a release year, or every Autodesk application, this guide will help you through the process.

TYPICAL WINDOWS UNINSTALL

The simplest way to uninstall, and the way you've likely uninstalled programs in the past, is by using the default Windows Uninstaller. This is a quick, simple way to remove a handful of programs, but requires you to pick each application one by one, running through each applications uninstaller steps. This can be a tedious process if you are trying to remove many different software titles and versions.

You can access the Windows Uninstaller by going to Control Panel -> Programs and Features (see Figure 1). If your control panel items are set to "View By: Category" you will find "Uninstall a Program" under the Programs section. Both ways get you to the same place. From the list of applications, find the application you want to uninstall, right-click on it, and select Uninstall. Follow the applications uninstallation steps and wait for it to complete. You cannot uninstall more than one application at a time, so you may have some waiting time between each uninstallation. If you are uninstalling more than a couple, this is not an efficient method!

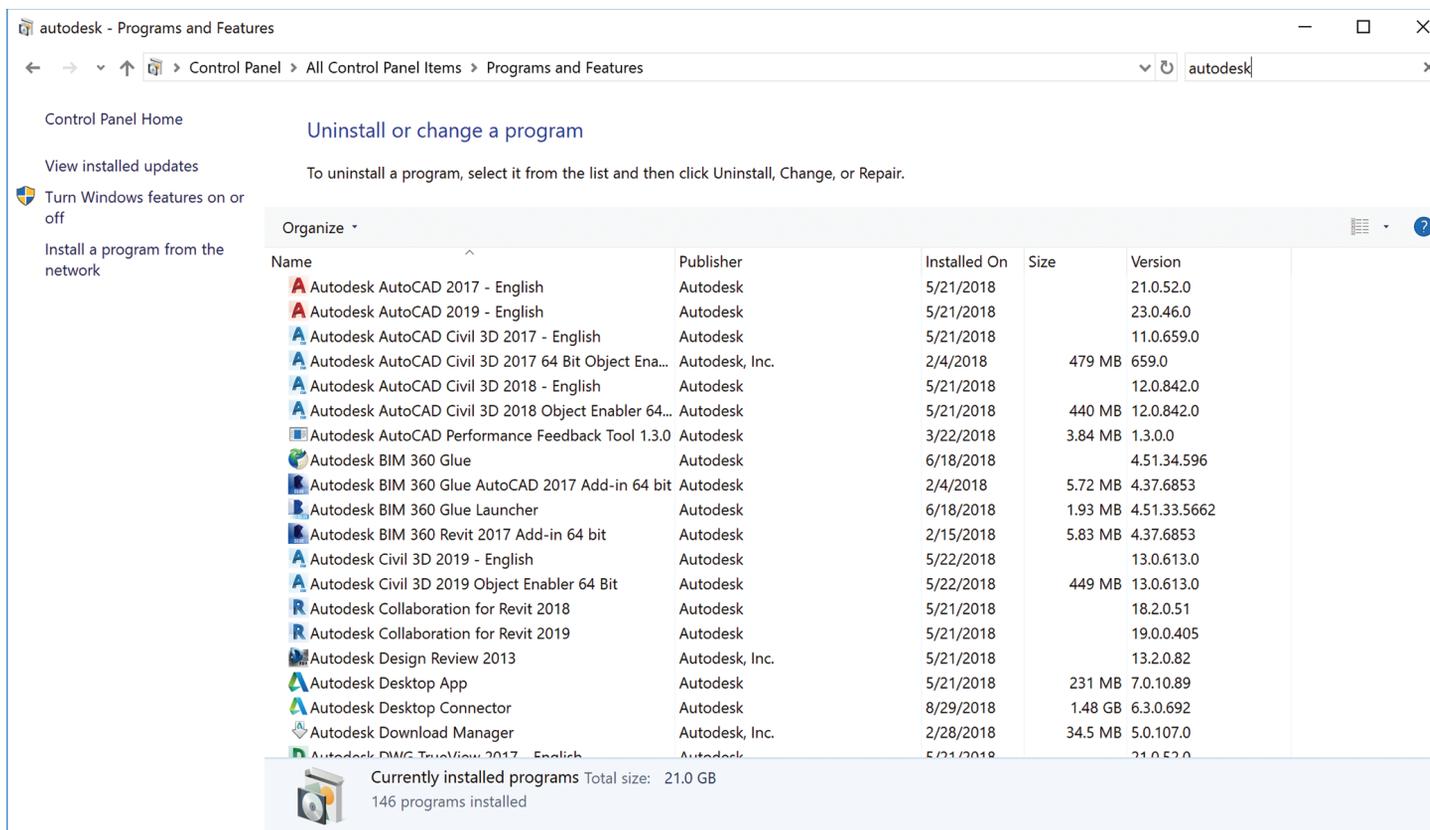


Figure 1

AUTODESK UNINSTALL TOOL

If you have multiple Autodesk applications to uninstall, you can use the Autodesk Uninstall Tool (see Figure 2). This is a very handy tool that lists out each Autodesk application installed on your system, including utilities, enablers, material libraries, etc.

You simply check the box next to each item you want to uninstall and then click Uninstall at the bottom. The tool will then begin an unattended uninstallation of each application. As it moves through each item, the checkbox will change to a flashing red arrow, telling you it is working on that item. As it finishes each item, it will change to a green check mark, to tell you it is successfully uninstalled, or a red X to tell you the uninstall failed.

I have found that it doesn't always list every Autodesk app and that often several uninstalls will fail. But for a quick bulk uninstall that is easy for a user to run, this tool is great.

WMIC UNINSTALL

The most versatile way to uninstall is by using the WMI command-line Windows Management Instrumentation Command (WMIC) utility. This utility can be used for a wide variety of tasks, one of which is uninstalling applications using the CALL command. This command can be customized to uninstall any selection of applications by searching based on two types of criteria: Vendor and Name.

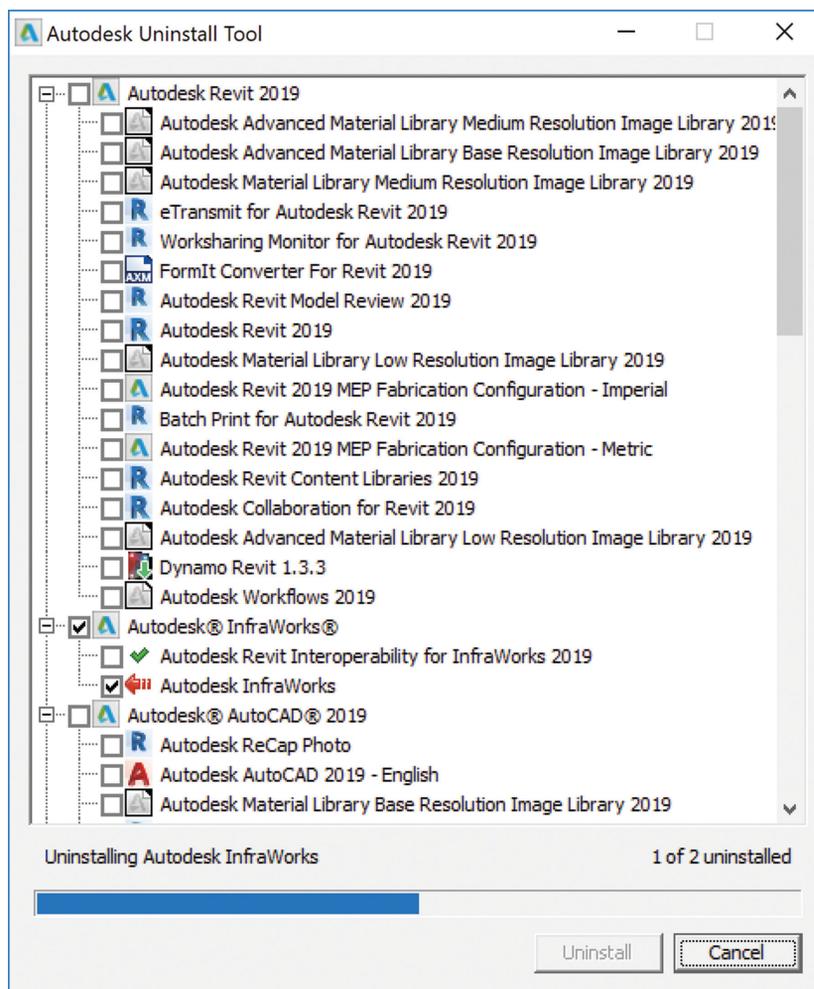


Figure 2

Project Management

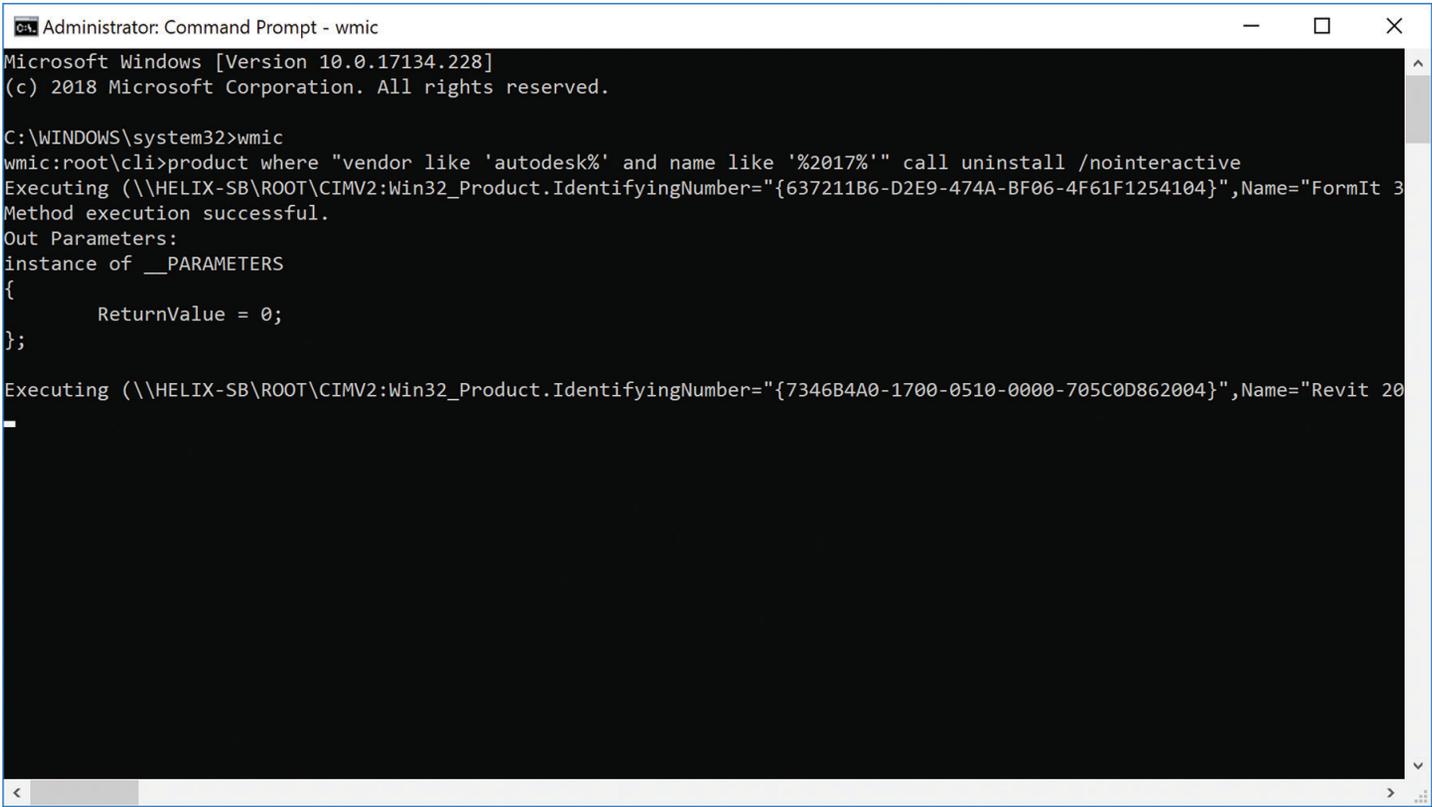


Figure 3

To select Autodesk applications, you can make a call for any applications that has the vendor “Autodesk.” Since every Autodesk application has that in common, it’s a great way to select all Autodesk apps.

Note that some Autodesk applications list the vendor as “Autodesk” and some “Autodesk, Inc.” If you search with ‘Autodesk%’ the wildcard ‘%’ will grab both variations of the vendor name. You can then use other search terms to narrow down what you want to select, like a product year in the application name.

For example, the Vendor ‘Autodesk%’ and ‘%2018%’ in the product name would find all Autodesk applications with 2018 in the name. As in the vendor name search, the ‘%’ on either side of the year is a wildcard, telling the search to find anything with 2018 in the name, regardless of any characters to the left or right of it.

I will show you the syntax for three of the most common scenarios. Uninstalling ALL Autodesk applications, All from a particular release year, or from multiple release years. You can modify these to fit your specific uninstall needs.

To get started, you need to first open CMD with elevated permissions. (You can also use PowerShell if you prefer.) To open CMD, click the Start button and type CMD. You will see the command prompt in the list of applications, right-click on it and select “Run as Administrator.” If you do not run CMD elevated (Run as Administrator), you may get an error when it begins uninstalling.

In the Command prompt, type “WMIC” and hit enter. This will start up the WMIC utility. From here, simply enter the syntax for the command you want to run and hit Enter to run it. As is the case with any utility, syntax is very important. Be sure you don’t miss any spaces, quotations etc. in your command. I typically use the /nointeractive switch, to make each uninstall process happen unattended.

In the list of commands below, don’t include the brackets, { } at the beginning and end—they are just here to encapsulate the command.

Uninstall All Autodesk Applications:

```
{ product where “vendor like ‘autodesk%’” call uninstall /nointeractive }
```

Uninstall 2017 Autodesk Applications:

```
{ product where “vendor like ‘autodesk%’ and name like ‘%2017%’” call uninstall /nointeractive }
```

Uninstall 2017 and 2018 Autodesk Applications:

```
{ product where “(name like ‘%2017%’ or name like ‘%2018%’) and (vendor like ‘autodesk%’)” call uninstall /nointeractive }
```

The WMIC call can be made on your local machine, a remote machine, or a list of remote machines. The above commands will run on your local computer.

To uninstall on a remote computer, prefix the command with { /node:computername } where ‘computername’ is the hostname of the

remote computer. For example: { /node:computername product where "vendor like 'autodesk%" call uninstall /nointeractive }

To uninstall from a list of remote computers, create a text file and save it to your local machine. For this example, I named it 'pc.txt' saved at C:\removal. The text file will contain the hostnames of the computers from which you want to uninstall, one hostname per line. No commas or semicolons, just hostnames, each on their own line. Prefix the uninstall command with { /failfast:on /node:@"c:\pc.txt" }

For Example: { /failfast:on /node:@"c:\removal\pc.txt" product where "vendor like 'autodesk%" call uninstall /nointeractive }

As each application uninstalls, you should get a return value of '0'. This means it successfully uninstalled. If you are getting a return value of 1603, check to make sure that you ran CMD elevated (Run as Administrator).

APPLICATIONS FAIL TO UNINSTALL

There are times when an Autodesk application becomes corrupt to the point it will not uninstall by any of the above means. This typically comes up when an application begins having issues running and requires you to reinstall it. However, trying to uninstall it fails, and when trying to reinstall, it tells you the application is already installed. There are two ways to fix this—by using the Microsoft Fix It tool or by manually deleting its folders and registry keys.

Microsoft Fix It Uninstall

The purpose of the Microsoft Fix It utility is to "Fix problems that block programs from being installed or removed." Basically, it searches to find the issues that are preventing the uninstall and fixing those issues, then removing the application. You can find a link to download this tool by searching the AKN (Autodesk Knowledge Network, <https://knowledge.autodesk.com>) for "Uninstall Using Microsoft Fix it."

Download and Run the utility. On the first screen, click "Next." Then select on the next screen that you are having an issue Uninstalling. From the list of applications, select the one you are trying to remove and click next. Then, select "Yes, Try Uninstall" on the next screen. It will then attempt to repair and uninstall (see Figure 4). If it fails to uninstall or the application you want was not listed, move on to manual removal.

Manual Removal

If all other methods of removal have failed, manually removing folders and registry keys will be necessary. If you are removing a single Autodesk application and leaving others installed, be careful to only delete folders and registry keys for that specific application, and not shared components. In some extreme cases, if shared resources are also corrupt, removing all Autodesk applications may be necessary. Before continuing, a quick warning: changes made to the Windows registry happen immediately and no backup is created automatically. Do not edit the Windows registry unless you are confident about doing so.

The first step in a manual removal is deleting the Product Code key from the registry (see Figure 5). This is what tells Windows that the application is installed and where to find its resources. Open the registry and go to HKEY_CLASSES_ROOT\Installer\Products. From the list of Product Codes, you need to identify the Product Code for the application you are trying to remove. Left-click on the first Product Code in the list and on the right-hand pane of the Registry Editor you will see a list of values. Look for the value ProductName—this will tell you the name of the application for that Product Code. You can arrow down through each Product Code until you find the application you are looking for. You can also right-click on the Products key in the left-hand pane and select "find" to search for the application name.

Don't forget to also remove Product Code keys for sub-applications if they would not uninstall as well. For example, AutoCAD 2018 also has an "AutoCAD 2018 Language Pack" that you would

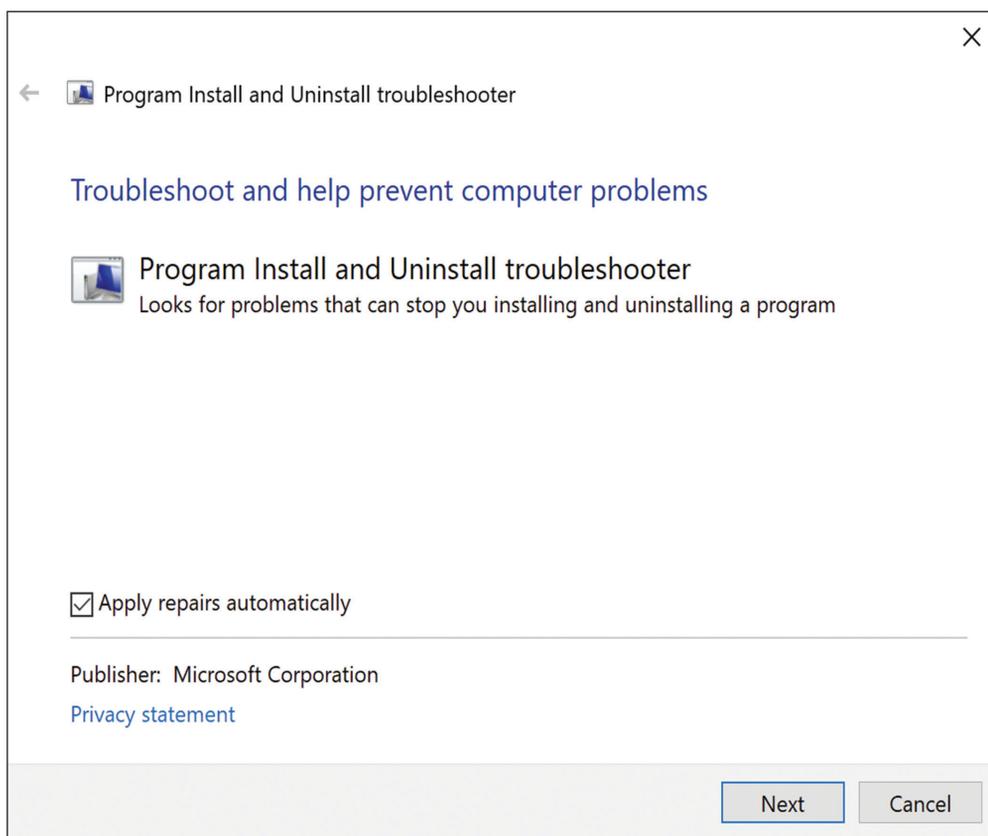


Figure 4

Project Management

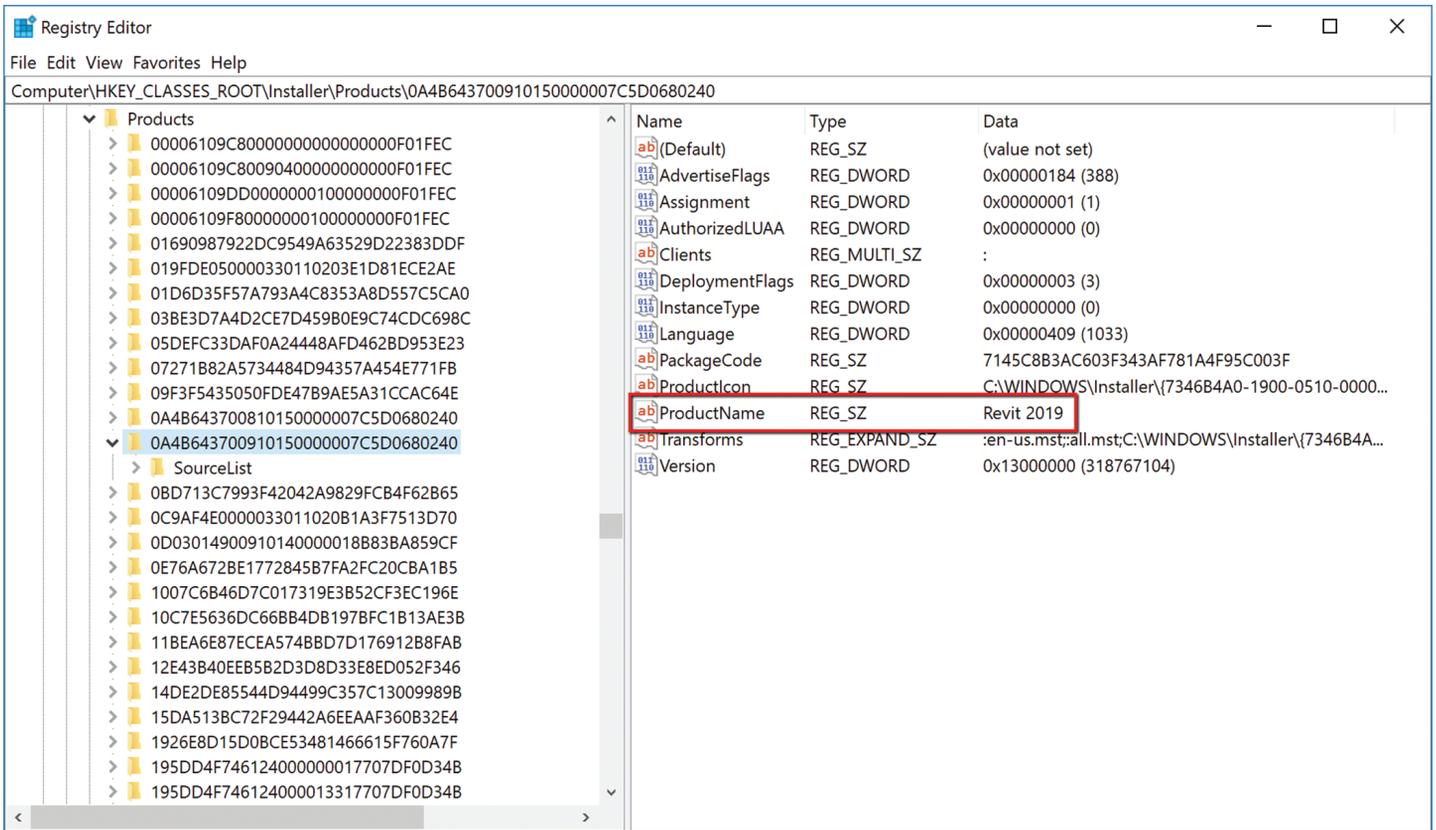


Figure 5

want to remove if you are going to reinstall AutoCAD 2018. Once the Product Code keys have been removed, clean up the remaining files/folders and registry keys for the application. The next section describes that process.

CLEANUP AFTER UNINSTALL

Regardless of the way you uninstall, it's important to do some manual cleanup of leftover files and registry keys, especially if you are uninstalling and reinstalling because of an issue with the application. You can find an Autodesk generic guide for removing everything Autodesk, and application-specific guides that will list out each folder and registry key that needs to be removed for a clean uninstall of that program.

These guides can be found on the AKN (Autodesk Knowledge Network <https://knowledge.autodesk.com>). The simplest way to find the guide you are looking for is to use the Search bar on the AKN website. Just search 'Clean Uninstall product year'. For example, 'Clean Uninstall Revit 2018.'

Follow the guide, deleting each folder and key it lists. When you are done, it's always a good idea to clear the Windows Temp folder before reinstalling.

For the sake of space here, I won't list out each folder and key for any specific application as they are readily available on the AKN.

CONCLUSION

As you can see, there are several ways to go about uninstalling the vast collection of Autodesk software you have installed. This article should help you save time and be more successful when uninstalling software.



Bryson Anderson has worked in the IT industry since 2008. During this time, he has been involved in many aspects of IT including Systems Administration, Networking, Telecom, Hardware, and IT consulting. Bryson has helped large and small companies in a variety of industries including healthcare, software development, engineering, and architecture to plan, implement, upgrade, and maintain their IT infrastructure. At ProSoft, he administers all aspects of the internal IT infrastructure and oversees ProSoft's custom workstation and server division. With his knowledge and experience in IT, Bryson consults with companies worldwide on the planning, implementation, and training of Autodesk data management and collaboration software as well as assisting customers with the licensing, installation, and deployment of Autodesk products.

Welcome to *AUGIWorld* Inside Track! Check out the latest opportunities to advance your skills, processes, and workflows in your firm with the most current AEC-related software and hardware updates available.

AUTODESK SITE DESIGNER EXTENSION FOR REVIT



<https://bit.ly/2jsbpaM>

Autodesk® Site Designer Extension for Autodesk® Revit® software helps architects, designers, and planners convey building site planning concepts to engineers. Site Designer runs inside Revit software and uses native families, components, and toposurfaces, so site designs become part of the overall model. You can model alternatives for mass grading, building pads, streets, sidewalks, parking lots, and retaining walls all within the Revit environment. More easily convert a sketched line into a street, sidewalk, curb and gutter, retaining wall, or parking lot in the model. You can manipulate Site Designer components using editing tools to change their location, elevation, grade, or geometry, and Site Designer automatically updates and maintains the underlying toposurface.

Features include:

- Report and schedule areas, volumes, and cut and fill volumes to better understand the impact of site design changes on requirements to move or add fill.
- Iterate conceptual designs and create more realistic visuals of the building site by incorporating grading features directly into the Revit model.

- Share a site model between Revit and Civil 3D through Land XML files, improving collaboration between architects/engineers working on a project.

Inside
Track

**AUGIWorld
brings
you recent
developments
in Autodesk
and related
software
items**

- More quickly add design elements to your site such as berms and drainage swales, minimizing the time required to mass grade a site and to try alternatives at the design development stage.
- Locate hardscape components such as streets, intersections, sidewalks, curbs, and walls that can follow the existing terrain and have controlled elevations and slopes—all while the toposurface is automatically maintained.

3D PDF EXPORTER FOR AUTODESK AUTOCAD - TRIAL



<https://www.prototecholutions.com/>

3D PDF Exporter For Autodesk® AutoCAD® exports solid and wire bodies to a 3D PDF file.

It has following features:

- Support for face level colors.
- Set a password on the exported PDF file.
- Option to control the file size and quality by specifying precision value.
- There is always a default compression, which helps reduce the file size as much as possible.
- Supports Autodesk AutoCAD 2013-2019.

SPIT I-BIM



<https://bit.ly/2MbOmhH>

SPIT i-BIM Plug-in for Autodesk® Revit® is a smart library with more than 230 objects.

The app is fully integrated into Revit through a simple interface. You can download a full range of fixing solutions (mechanical, chemical, and expansion anchors) into all your Revit projects. The BIM objects have been designed to be easily incorporated into an advanced 3D building model without reducing its performance or reliability.

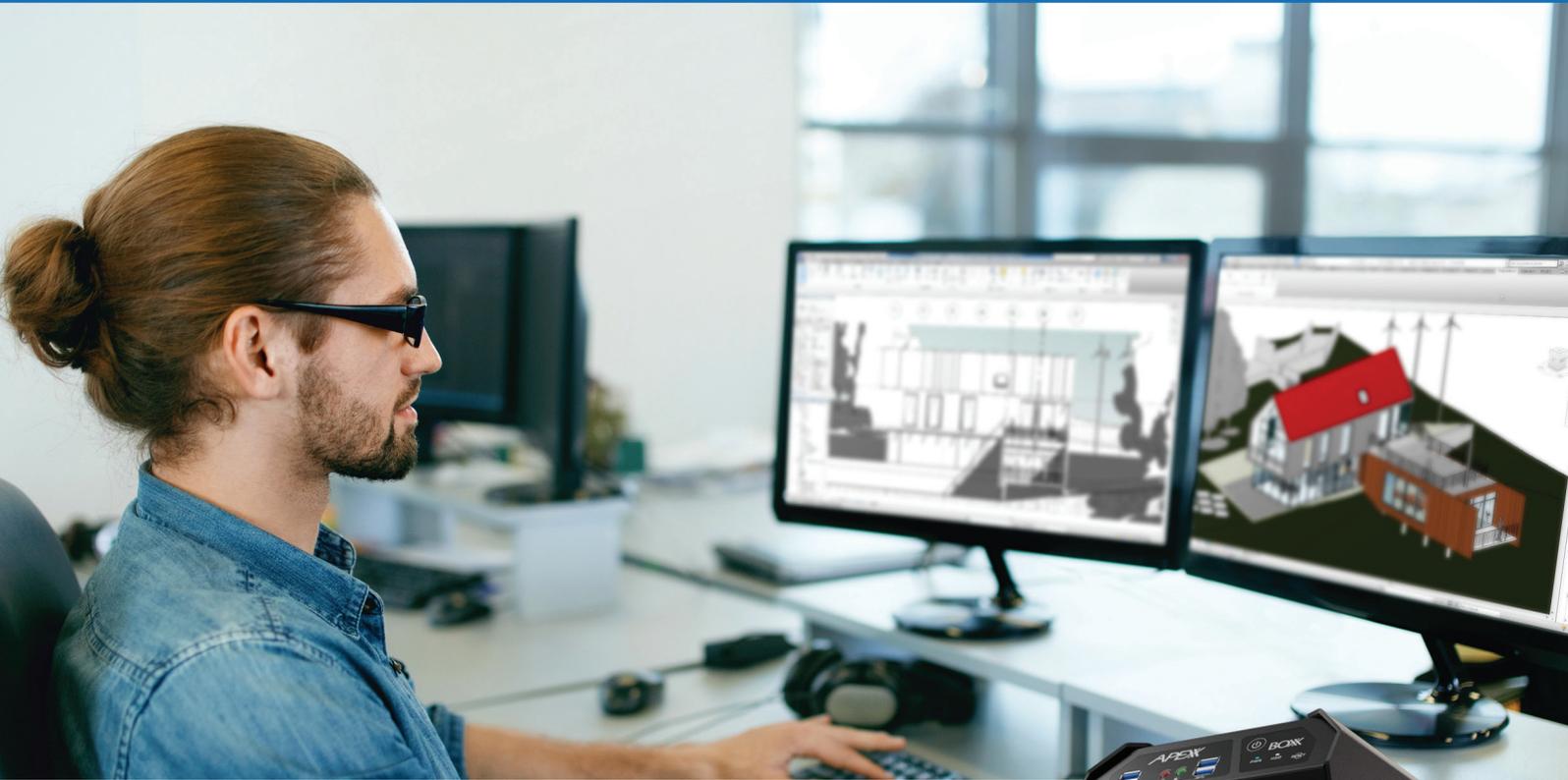
Available in version 1.0:

- More than 230 objects
- Customized browser
- Online library update
- Direct access to mechanical properties and technical datasheets for anchors
- Direct link to ETA documentation

Note: This app uses a custom installer (not the standard App Store installer).

If you have some news to share with us for future issues, please let us know. Likewise, if you are a user of a featured product or news item and would like to write a review, we want to know: brian.andresen@augi.com

If **Revit** is your software, make this your **hardware**.



APEXX S3

- Intel® Core™ i7 professionally overclocked to 4.8 GHz
- Up to 2 NVIDIA® Quadro™ RTX GPUs*
- Massive internal storage

The only workstation built to accelerate workflows and increase productivity for architects, engineers, and BIM managers like you.



* Available in November



(888) 302-0223
512-852-0400
boxx.com/augi

BOXX