AUGIWorld

The Official Publication of Autodesk User Group International

July 2017

Third-Party Apps for Autodesk Products

Also in This Issue

- Tech Manager as Task Master
- Revit/Analytical Interoperability
- Seven Songs about Scripts

THE HP Z2 MINI

HP's first mini workstation designed for CAD users

Next level power

Get 3X graphics performance[1] with powerful NVIDIA® Quadro® M620 professional graphics for demanding 3D models.

Designed for the workspace of the future

The HP Z2 Mini G3 Workstation is 90% smaller than than the HP EliteDesk 800 G2 tower.

Industry-leading reliability

Tech issues should never hold you back. Feel confident using a workstation certified for the most popular CAD software.

hp.com/go/Z2mini

NVIDIA®

AUGIWorld

contents

product focus

16

18

24

26

columns

Cover image:
*Stock Photo - Shanghai, China - June 5, 2015:
Soho Hongqiao building in Shanghai. Modern
futuristic architecture office building near
Shanghai Hongqiao Airport.*

Letter from the President

Those of you who follow BLAUGI know that I recently returned from the BILT ANZ 2017 conference in Adelaide, Australia. I already wrote about the specifics of the event in a series of blog posts, so rather than rehashing that here, I thought I'd talk about conferences in general.

The first professional conference I attended was Autodesk University back in 2004. (Actually, I also went to an ASCE conference as a college student...but I'll be honest, I had no idea what I was doing back then.) Since then, I've had the privilege of going to many different events, both for my industry and my hobbies, and I've come to realize that there are many similarities between gatherings of like-minded individuals, no matter what the topic of the actual event.

First, the creativity of the community is on full display. Whether it's Dynamo enthusiasts at a BIM conference or cosplayers at ComicCon, there will be people pushing the limits on what is possible and practical. (Modeling mold in Revit? And using phases to show its repair status? Sure, why not!) If the event is large enough to have an exhibit hall, you can also talk with developers about the neat stuff they're building to expand the functionality of current programs. Sometimes, you don't realize something's a problem... until you run across an app that solves the problem!

Second, there's the potential for worldwide networking. I have acquaintances now all around the globe—across the US, and from England to Australia and several places in between. Some of these people I met online first, but the connections were solidified by meeting in person. It works the other way, too: I've gone to an event across the country and encountered colleagues from my hometown who I'd never actually met before. BILT ANZ gave me a new favorite "small world" story, too: I ran into someone I'd worked with briefly on a project in New York. I live in DC, he lives in Sydney now, and we met at a conference in South Australia. The world really is shrinking.

Third, I absolutely love the "Hey, me too!" responses you get when people share challenges they've had. (I've been known to refer to AU as "group therapy.") At events like BILT and AU, you can describe some incredibly obscure quirk or really specialized new feature and find half a dozen other people who have already mastered it. They're also great places for my fellow CAD and BIM Managers to connect with each other and to share tips and strategies for thriving in a role that you probably didn't go to school for.

Here at AUGI we are fortunate to be part of an enormous global community—albeit a primarily virtual one. Don't get me wrong: online communities are great, but since we exist in the physical world, I would encourage you to make connections there, too. Find a conference that matches your professional interests and find a way to attend. Maybe submit a paper to present, or pitch it to your management as a marketing opportunity for your firm, in addition to the career development you'll get out of it. Need help with your pitch? The AU website actually has a "convince your boss" template that you can use to start the conversation.

If going to a formal event really isn't in the budget, find your local user group. If there isn't one in your town, consider starting one! Meetup.com has made organizing events and finding people with common interests easier than ever.

And you know what? Odds are, you'll meet a fellow AUGI member while you're there!

Kate Morrical
AUGI President

A Closer Look at Collaboration

L ast summer I wrote an article on collaboration, and it is time to cover it some more. In last year's article, I chose the definition for collaboration as:

Working with others with an end goal of producing or creating something.

For CAD professionals, designers, architects, and engineers, this is our job. In last year's article, communication, coordination, and sharing files via email, FTP, and cloud services were discussed along with some tips on how to best do so. This year we will dive more in to specific tools and processes within AutoCAD® that can be used to achieve affective collaboration.

In any industry, from manufacturing parts to constructing buildings, drawings are created to show how an end-product is to be built. Collaboration involves sharing these drawings with multiple parties during the design process to get their input and assistance, and coordinate putting all the pieces together.

Once again, this article will focus on the construction industry as that is where I have spent my entire career, but the principles here can cross into many other industries. In building construction, the team that will be collaborating is typically composed of an architect (usually the lead), civil, mechanical, electrical plumbing and fire protection engineers, interior designers, contractors, suppliers, vendors, and, of course, the building owner—the one everyone is ultimately working for.

With all these players, it is important to communicate changes to all pertinent parties on the team in a timely and easy to understand way. This will often be handled through emails and the exchange of electronic CAD files that are created in AutoCAD. On BIM projects other software is used, and in many cases, a vertical package such as AutoCAD® Architecture is used, but since this column is AutoCAD focused, we will stick to it. Sharing of these files was discussed in last year's article, so be sure to check that out (*AUGIWorld* July 2016).

COMMUNICATION

Communication is key to a successful project, but in this modern world of instant messages, snap chats, and tweets, it seems as if shortness in responses or descriptions has become the new norm. Evidence of this shows up in emails without subject lines or signatures, drawing background updates without any indication of what was changed, and generic submittals without options checked or highlighted. Everyone is flying through processes or multitasking, thinking that they are saving time—but in reality it is costing time and money for them and likely others in the communication chain.

Some of the biggest mistakes made on projects happen due to the lack of good communication. Without clear communication, things are assumed, done shoddily, or are missed completely. When collaborating, communication is what keeps the project moving forward.

COORDINATION

Coordination requires communicating items shown in an electronic file that represent real-world items with the rest of the team. Wall or space configuration changes, new equipment, revised lighting layouts, or myriad other items need to be communicated to the entire team in order to make sure nothing is missed. In the early stages of a project, when the plans are not yet annotated, printing would show lots of lines, circles, and rectangles that represent appliances, furniture, fixtures, and millwork. Some are pretty easy to determine as they look like their real-world counterparts—this is typically the case for drinking fountains, water closets, doors, windows, and the like.

Unfortunately, many of these items show up in a print as just rectangles or circles and it requires going into the drawing file to figure out what they are—not a big deal, because as designers we spend most of our time there. The frustrating thing to find out is that they truly are just rectangles and circles… and they are on layer "0" or "text," or something similar. This is where the guessing, assumptions, or emails and phone calls start. This has BAD CAD written all over it. Whether you are a CAD guru or not, some simple AutoCAD tools can be used to make sure that you, if you are the plan creator, can effectively communicate your ideas to others on the team.

AUTOCAD TOOLS

There are some basic core tools within AutoCAD to help you communicate your ideas and keep the team up to speed with changes. Two that are very basic and easy to use are BLOCKS and LAYERS.

Blocks

With the Block command, you can turn your rectangle into a "Table," a "Microwave," a "Toaster," or a "File Cabinet" and your circle into a "Fire Extinguisher," a "Dining Table," or a "Hot Tub" with a few quick steps.

1. Select your rectangle that is supposed to represent a "Toaster," and change it to layer "0" and set it to Color "Bylayer" (see Figure 1)

2. Type 'Block'

    A. Give the block a name: "Toaster" (see Figure 2)

    B. Select "Specify On-Screen" for your insert point

    C. Select object and pick your rectangle on screen

    D. Select "Convert to block" (so it will now be saved in your drawing)

    E. Uncheck "Allow exploding" (we don't want people messing with your work)

    F. Select "OK" to finish

3. When the dialog exits, there will be a cursor asking you to select an insertion point. At this point, select a point that makes sense for the particular block. For the Toaster, let's just pick the top midpoint of the rectangle.

You now have a toaster block and if someone picks on it in AutoCAD, the properties will indicate that it is a block called "Toaster." You can copy this all over your drawing or save it to disk for use on other projects. And if you want to make it look more like a real toaster later when you have more time, you can just double-click on it and open it in the block editor and add some fancy stuff to make it look more real world. The process to make your rectangle into a block takes about 20 seconds or less—a great use of time!
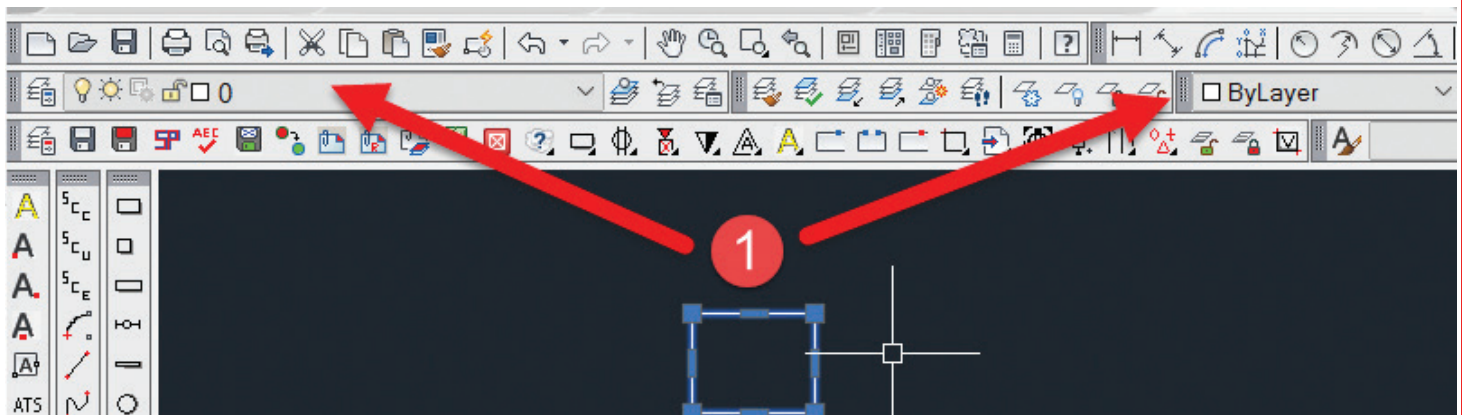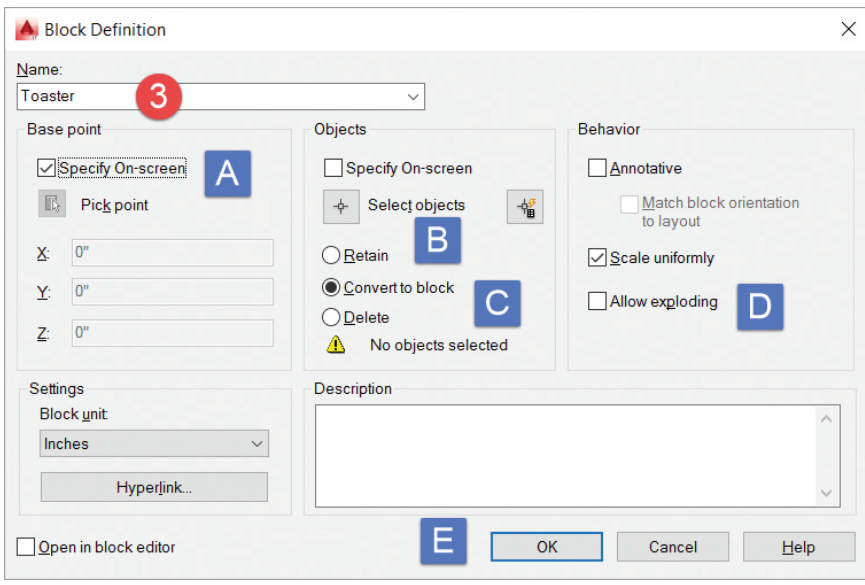

Figure 1

AutoCAD

Figure 2

ter cooler (right). The one on the left looks prettier to some than the one on the right, but the one on the right is specified and installed in nearly every project. Knowing this, why would you continue to represent the water cooler with the water bubbler symbol on the left?

Layers

The "0" (zero) layer is a chameleon. If you create a block on layer zero, when inserted on another layer it will assume the color and the line type of that layer. Note: creating a block on zero and giving it the color blue defeats the purpose of creating it on "0."

A huge benefit of creating blocks this way is that they can be used to represent different phases by just placing them on different layers with different line type and color properties. This also helps other team members—i.e., consultants who print the files on their end can revise a layer color to their choosing to match their own plot settings. Not everyone plots the same colors and the same line weights. Layer DEFPOINTS is commonly used for items that users do not want to print, but show up on the screen for reference. Layer DEFPOINTS is for dimension "definition points"; it is not for design notes. You can easily create your own "non-plot" layers for notes or attributes in your blocks that do not need to be plotted, but need to be seen. Just select the plot column in your layers dialog and toggle the printer to the non-plot image.

A good way to organize and keep track of non-plot layers is to prefix the layer name with an NP-. This way all your non-plot layers are sorted together. Another option is to add -NP at the end of the layer name to designate that it is a non-plotting layer. You may have a layer called A-WALL and a layer called A-WALL-NOTES-NP for reference notes that you don't want to plot. It all depends on how you want to organize them, but the NP makes it clear that it is not a plottable layer. It won't take long for teammates to figure out that those are non-plot layers that they can freeze as necessary in their drawings. When using DEFPOINTS for your notes and construction lines it can clutter up the drawings, so others will either erase them or freeze the layer they are on.

Make it a habit to make blocks for commonly used items. It is common for users to have toilet and sink blocks, but it seems that items such as hand dryers and paper towel dispensers end up being just rectangles drawn on a wall. Many manufacturers have downloadable drawing blocks for these commonly used items. Alternatively, you can draw them yourself from a manufacturer's specification sheet. By having an accurate representation of the item, it is easier to verify potential physical space and clearance conflicts as well as potential ADA issues. Once you get in the habit of using these blocks, you will realize how much more accurate and useful your drawings are.

This can be a big help to others who use the drawings, whether it be consultants or in-house coworkers. A small selection of common items I see on background drawings that are represented by rectangles and circles and could easily be made into blocks include clocks, microwaves, coffee machines, ice machines, fire extinguishers, trash cans, and hand dryers. You can amp them up a bit by including notes and model information on one of your non-plot layers that we will discuss shortly.

Now the following may seem a little too detailed for some, but I think it is a good practice. If you work with a team that specifies the same equipment on each project, and that equipment is typically installed, use blocks that appropriately reflect that. For example, in Figure 3 are images of a water bubbler (left) and a wa-

Layer Zero and layer DEFPOINTS have a relationship that can cause confusing issues for users. Have you ever tried selecting a line in model space or paper space that you could not seem to touch? Frustrating... This issue is caused when layer zero is frozen and there is line work on Layer DEFPOINTS. Until you thaw layer zero you will not be able to erase the line on layer DEFPOINTS. Layer zero should not be frozen, but if it is this can come up.

Layer Colors

There are at least hundreds (256), and possibly thousands of colors available in AutoCAD when creating layers. Use this to your advantage and communicate specific features to the team by creating dif-

Figure 3

Figure 4

ferent colors for different layers. A side benefit of this is that it helps you realize when something is drawn or placed on the wrong layer. *Example:*

Create a layer called A-FURNITURE and sent it to color 44. Create a rectangle the size of a table on layer zero and save it as a block called "Table." When you insert this block on the 'A-FURNITURE' layer, it will turn to color 44 automatically. Having items as different colors on the screen helps differentiate background items to drawing users. With properly configured CTB and STB files, being a different color does not necessarily mean it will plot a different line weight.

Clouds

Clouds don't have to be restricted to revisions. They are a great way of communicating changes to teammates. Create a changes layer, such as "NP-Changes" with the color set to color #10 (red) and cloud items you have changed using that layer. If it is a global sheet or plan change, type out a quick note in the center of the drawing and cloud it with the #10 red cloud. This type of communication helps to avoid what equates to Easter egg hunts by other team members.

Auto Publish

When it comes to communicating changes effectively, PDFs are often the "go to" method. An AutoCAD tool we use regularly is Auto Publish, which allows you to automatically publish DWFs or PDFs to your job folder when exiting or saving a file. When it is used, saves or exits (depending on your settings) will generate a prompt that asks if you want to publish the drawing to PDF. The benefit of using Auto Publish is that you constantly have updated PDFs of ongoing edited drawings. This may or may not be advantageous depending on how you do your work. For instance, we work with XREFs in a sheet in model space, where the paper space tab is an actual final sheet drawing, like E1.1. If you commonly work in one file that has paper space tabs for each of your final printed sheets, Auto Publish is an excellent tool to keep an ongoing record of your progress in PDF. Configuration options can be found under the "Options" dialog.

When first using the Auto Publish feature it will seem very annoying (it was for me), but once you get accustomed to it you will find it very useful (as I did).

Example Usage:
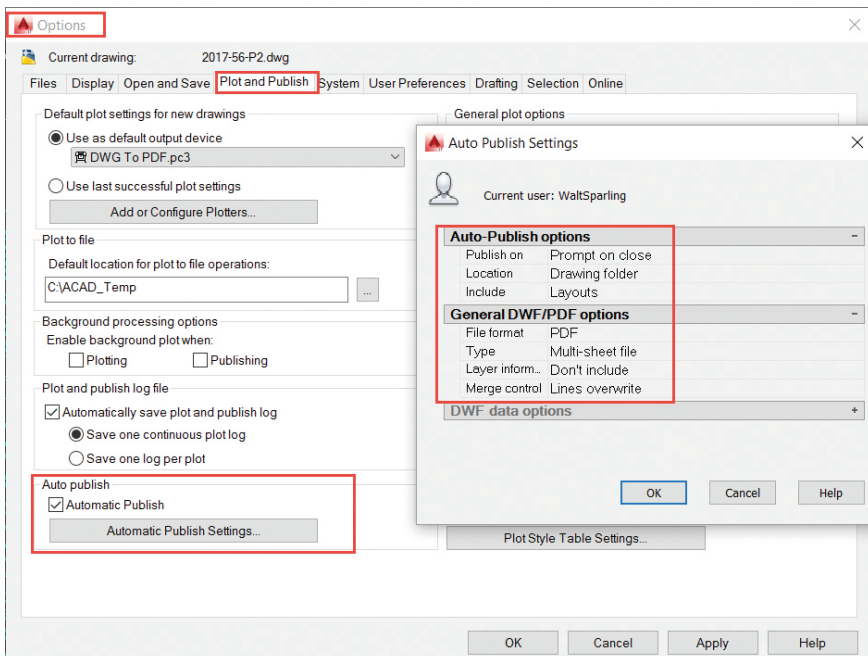
If you are regularly getting inquiries from your team members about progress on your project, you do not have to stop and shift gears to open each of your files and create individual PDFs. With Auto Publish being one of your tools, when this request is made you can simply reply to the email and attach the PDFs from your project's working directory that were automatically created when you left the working drawing. This feature actually adds only seconds to the time it takes to close the drawing, but can save a lot of time over the course of the project.

SPEAKING OF PDFS...

PDFs are one of the most common forms of electronic media used to share updates and records of a project's status. For example, when a revision is made to a drawing sheet, it is common to not only send the signed and sealed document, but also a PDF of the revised sheet. This allows someone to track the history of specific sheets or specific revisions in a set.

Figure 5

AutoCAD
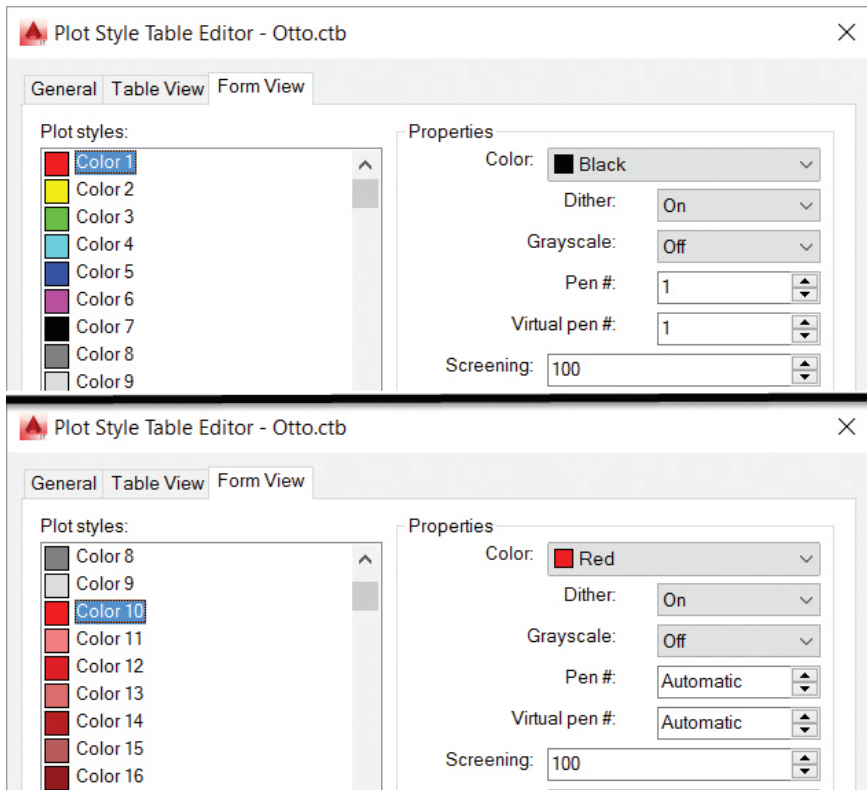
Figure 6

Hopefully, the architect and the consultants are keeping a historical record through standard folder structures for the various releases or revisions on the project. This makes it easy to resend individual sheets or records of drawings up to a certain revision, etc.

A habit I have formed, which is easily done with Auto Publish, is to not only have the individual PDF file in the directory, but also to have a merged set of all sheets. This makes it much easier to coordinate than trying to assemble a bunch of revised individual sheets from multiple folders. The ability to merge PDFs is in most commonly used PDF editors.

HIGHLIGHT CHANGES

After the project has gone from design to plan review, or after bids have come in, there is a chance that changes may be required to the plans. This is another area where communication is key.

Let everyone know what has changed. When making changes, develop some method of tracking and then sending that information along with the drawing updates. Consider sending a PDF with the areas clouded and commented on or add this to the drawings on a separate layer.

SEEING RED

As a checking mechanism, we use text in our details and notes that is set to color #10 for specific information that requires changing for each project (see Figure 6). We set up a color #10 in our CTB that will force it to print in a red color in PDFs, which we use for

plotting and checking. If we or the engineer see the red color, it is known that it has not been addressed. Once the item is updated, it is changed to color "By-layer" so that it plots correctly. This is a great way to communicate a variety of items to in-house team members and consultants as well.

FLEXIBILITY

The cool thing about AutoCAD is there are multiple ways to do things. You may use STB files in lieu of CTB files or you may use sheet sets in lieu of standalone sheets. We are not limited by our tools when it comes to collaboration.

Even though I'm talking about basic AutoCAD tools, keep in mind that these tools, when used properly, are a great way to communicate your ideas and intentions. All of these suggestions are small individually, but when used together, can go a long way towards making your collaboration smoother. If you use other tools within Auto-CAD or in conjunction with AutoCAD that you feel have made your collaboration process more effective or official, email them to me and we can possibly include those in a future article.

Combining a little customization with the AutoCAD tools discussed here can automate a lot of these processes. By using palettes or toolbars with macros and scripts, you can make these additional steps very fast and efficient. If you don't know how to do this, just ask.

Collaboration is a team effort, and sometimes the little things we do can make a huge difference. When it comes to collaborating with the team, the team leader sets the tone. Let it be a good one.

If you want more details or have a comment, feel free to send me an email at walt@functionsense.com.
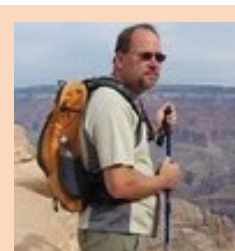
Walt Sparling has worked in the building design industry for 25+ years, starting as a hand drafter. He moved on to CADD in the mid 1980s and then into CADD and networking training and consulting. Walt has served as project manager and designer in the mechanical and architectural realms and currently works with an electrical engineering firm in Tampa, Florida. In his spare time, Walt maintains a couple of blogs and a personal website: FunctionSense.com and waltsparling.com

Most Buildings Sit On The Ground

That's Why BIM Is More Than Buildings

BIM is more than buildings. **BILT** (formerly RTC) is a global **BIM** technology conference dedicated to a sustainable built environment. We believe BIM is a growing ecosystem of **Buildings, Infrastructure** and **Lifecycle** integrated with **Technology**. Our delegates, speakers and sponsors are globally recognised AEC industry experts who can help you select the best solutions for your business needs. Time is money and BILT is ready to invest in your future.

North America	Europe
Toronto, Canada	Aarhus, Denmark
3 - 5 Aug 2017	5 - 7 Oct 2017
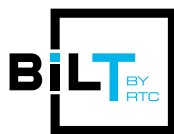
BILT BY RTC — Register Today
www.rtcevents.com/bilt

f RTC Events Management   🐦 @BILTevent   🔗 rtcevents.com   ✉ secretary@rtcevents.com

GLOBAL PLATINUM SPONSORS
AUTODESK   hp   NVIDIA

GLOBAL GOLD SPONSORS
AUGI Autodesk User Group International   CHAOSGROUP   HIVE ConneXions   revizto

GLOBAL SILVER SPONSORS
atlas   CADLearning design your future

GOLD SPONSORS
BIMsmith   central innovation   dRofus
FLUX.IO   GRAPHISOFT   PLURALSIGHT   Trimble

SILVER SPONSORS
Bentley Advancing Infrastructure   FenestraPro   IMAGINiT   UNIFI

BRONZE SPONSOR
A2K Technologies

GENERAL SPONSORS
AECOM
REDCRATER

Revit / Analytical Interoperability
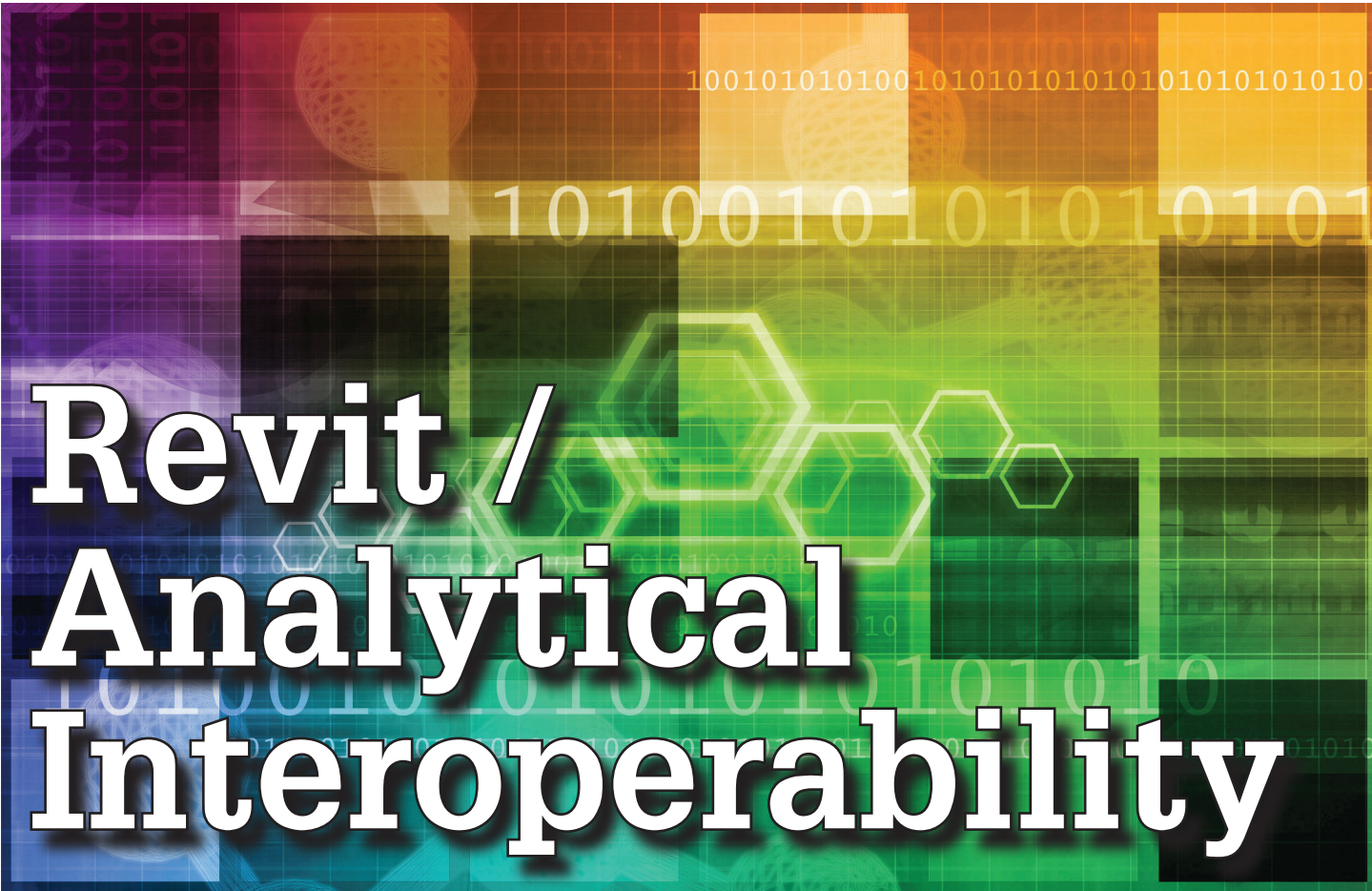
In the fast-paced environment we live in, many engineering firms look for faster, better ways to design, model, and produce documents. Every major analytical application has its own method for integrating engineering models with BIM. One such software developer is Bentley Inc., which first developed a product to integrate Autodesk® Revit® with their Engineering software, and have since expanded the software to start integrating with other non-Bentley applications.

WHAT IS INTEGRATED STRUCTURAL MODELING?

What if there were an application that could be used for everything that a structural engineer typically does on a project (Modeling, Analysis/Design, Drawing Development, not to mention those spreadsheets and custom formulas that we all have—either on the network or, heaven forbid, saved to a non-backed-up hard drive)? Such an application sounds great, doesn't it? Unfortunately, an application like that would most likely be extremely complex and not very user friendly.

Well, the application discussed here may not be the one-stop-shop application we would all like, but it does help integrate multiple applications. Several years ago, Bentley developed an application

to integrate their RAM Structural Systems software with the Autodesk Revit product. As they further developed the product over the years, they have integrated it with multiple other products (both Bentley and Non-Bentley applications). Tekla is just one of the first non-Bentley applications that has been integrated in the ISM workflow.

Figure 1: Overview of ISM Components
(Bentley Communities: Integrated Structural Modeling, Feb 2017)

One of the advantages of the ISM product is that it gives you the ability to selectively choose what members are brought into the different applications (analytical or BIM). So, if you change the framing to a single bay you can essentially modify just those members in the repository model. This is also how you can efficiently round-trip models from Revit to Engineering applications.
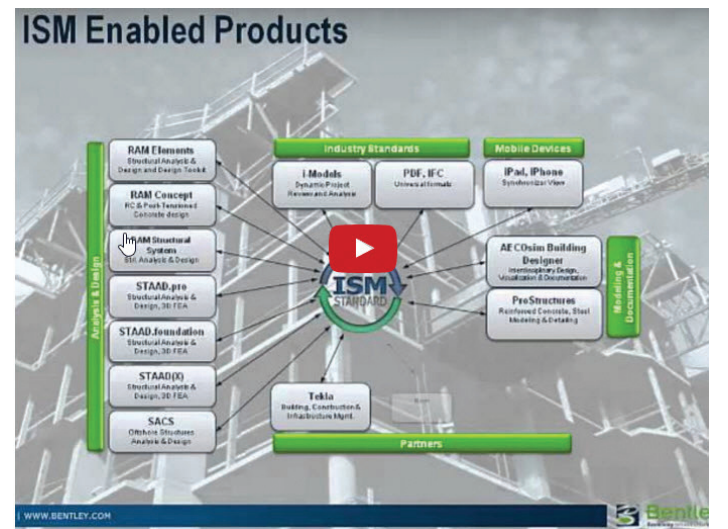
COMMON WORKFLOWS

When it comes to the workflows, models can be started in a couple different ways. These are the three most common workflows that people use to integrate analytical models with Revit (or vice versa). There are three main steps to integrate Analytical and BIM models, as follows.

1. Create the Repository model
2. Import the Repository
3. Modify / Update the model

One of the most common workflows is for the engineer to start the analytical model in an application such as RAM Structural Systems. After the engineer has modeled the structure, added the load cases, assigned codes, and analyzed the structure, they will generate the ISM Repository. Once the initial ISM Repository model is generated, the designer is ready to set up the BIM model by recycling the engineer's model. Being able to do this will save tons of time and money for the project team's budget. This will allow the team to develop sheets, details, and sections much faster.

When using this workflow, it is very important that the analytical model is developed as much as possible to ensure a clean model is passed to Revit. What this means is that when the repository model is generated it must have member sizes assigned so the designer can map basic sizes from the analytical model to Revit families. If sizes can't be mapped to Revit families, then Revit won't know what families to use when the repository model is brought into Revit.

The second most common workflow is to start the model in Revit and then generate the ISM Repository from the Revit model. Once the repository model is generated, it can then be brought into the analytical application to generate load cases and analyze the structure. After the engineer has analyzed the structure and made modifications, the ISM Repository model is then updated. From there the designer updates the BIM model from the repository model. When this process is done (this is called round-tripping the model), it is generally best to just select and bring in the modified members rather than to try pulling the whole model back into Revit. This approach requires the most communication between the engineer and designer so the latest member information is updated to the BIM model.

The third method (the least common workflow) is a hybrid of the first two methods, where the designer starts the model in Revit, but only defines the grid and levels then creates the repository model for the engineer. This can be done by either placing the grids and levels in the model or using the copy/monitor tools and utilizing what the architect has defined in their model.

The engineer then creates a new analytical model and transfers the data from the ISM Repository model to the Analytical model where the engineer can then start to build and analyze the model as they typically would do on any other project. After the members have been sized initially, the engineer updates the ISM Repository model and has the designer update the BIM model.

There is no right or wrong method to setting up the integrated model between engineering and BIM models. This is something that should be discussed with your firm's BIM manager and develop best practices when integrating Analytical and BIM on your firm's projects.

INTEGRATING BIM AND ANALYTICAL MODELS

For this article, let's assume that going from RAM to Revit is the chosen workflow by the project team. After the engineer has developed their analytical model and analyzed the structure, it's time to generate the ISM Repository by exporting the saved model. From the RAM application, the repository is created by selecting the File > Create ISM Repository from the drop-down menu and save it to your company's standard file location.

One of the keys to successfully generating a clean repository model that Revit can utilize is to make sure that all the modules display green. If any of the modules do not display as green, Revit will have issues when the repository model is brought into Revit.

In the Revit model, clear out the levels that aren't needed. When the repository model is brought into Revit, the stories from the RAM model will generate the correct levels in the Revit model.

From the Bentley drop-down menu, select New from Repository from the ISM Revit Plugin CONNECT Edition toolbar. This will load the interface to connect to the ISM Repository created from RAM SS application.

Locate the repository model on the network, and advance to the next dialog box where you will select the members that you wish to bring into the Revit model (this is the Structural Synchronizer viewer). On the initial set up of the Revit model from the repository model you will select all members. After selecting the members to bring into your Revit model, advance to the next dialog box. This is where you will map RAM sections to Revit families for the conversion process.
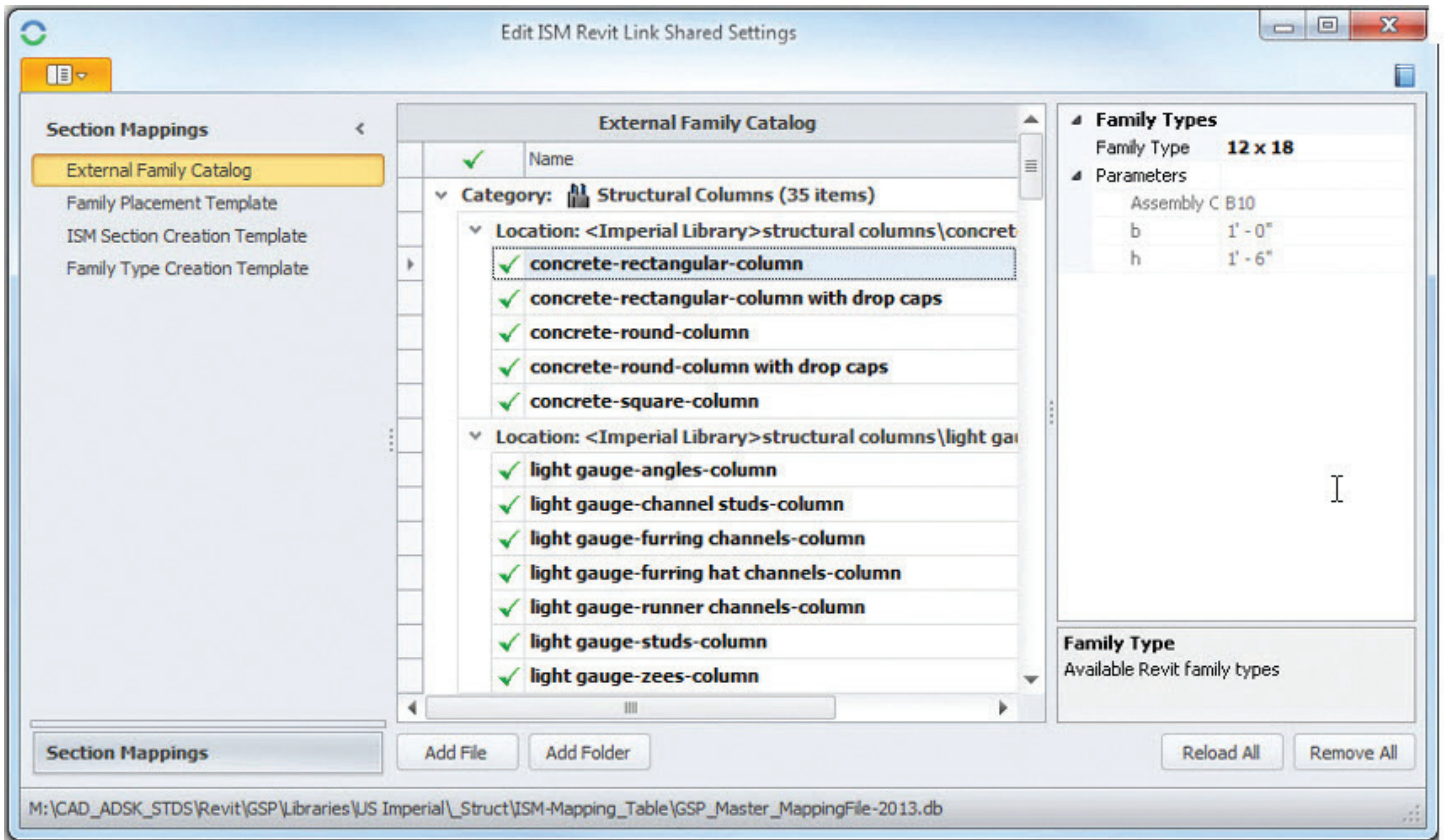
Revit Structure/Bentley ISM 2017

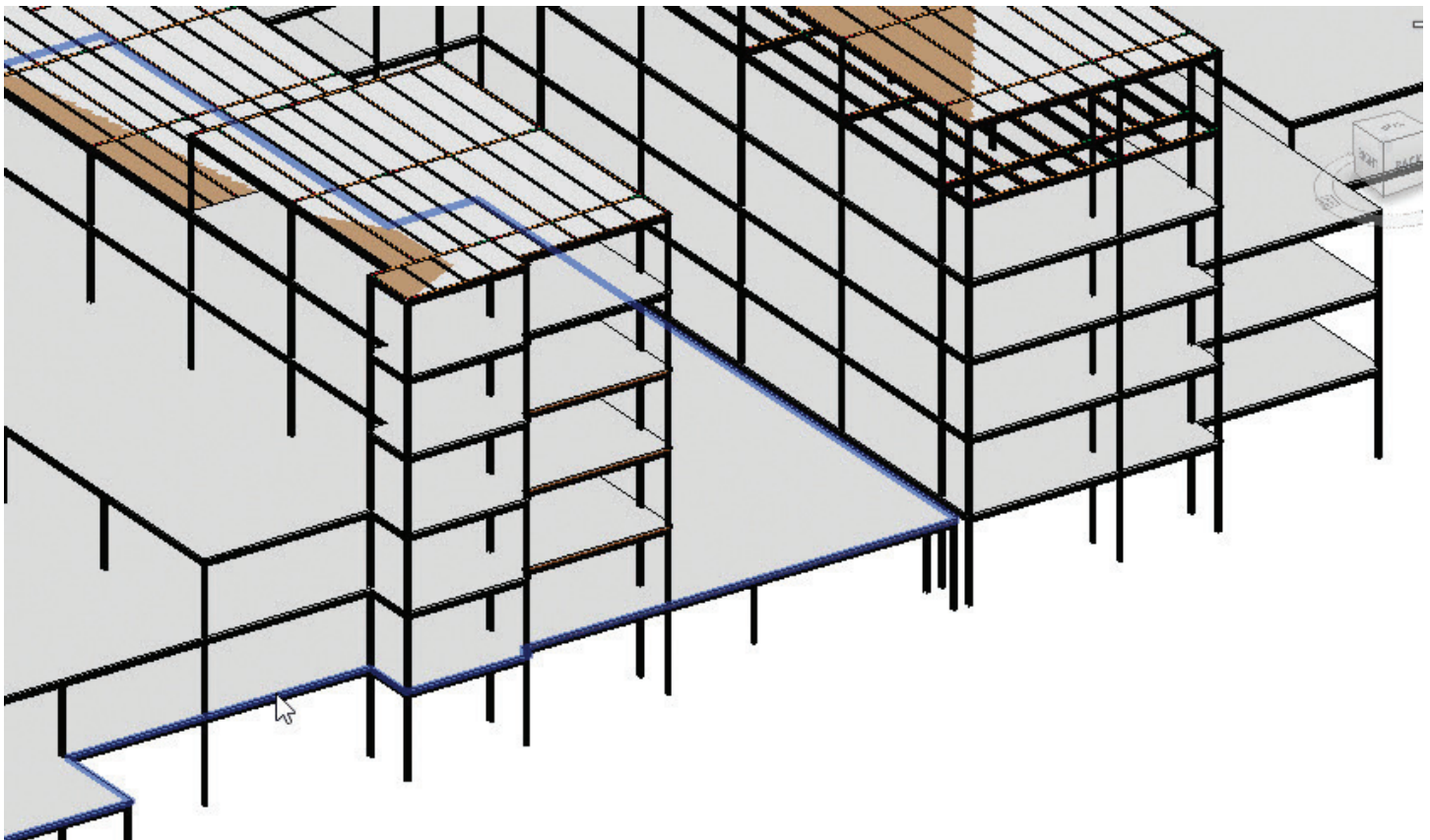*Figure 2: ISM mapping of parts*

Figure 3: Imported repository model

Once all the members are mapped, the repository model is ready to be brought into Revit. Depending on the size of the model this may take a few minutes to finish processing.

After the model finishes the transfer, you are ready to start developing the project as if it had been modeled in Revit natively (development of sheets, sections, and details, etc.).

Some firms try to bring in the model one time, other firms like to do what is referred to as "round-tripping" the model between Analytical and BIM.

CAPABILITIES AND LIMITATIONS

With the development of any software there are always things that users expect to be able to do. Bentley does a pretty decent job of documenting the capabilities and limitations of the ISM application. Those capabilities and limitations can be found on the Bentley Communities wiki page: https://communities.bentley.com/

From there you can do a search for the ISM 6.0 (for the latest list of Capabilities & Limitations). This page will display the limitations of ISM with each of the Bentley Integrated applications.

KEYS TO SUCCESS

As you use the ISM tools more you will find little things to help you develop own best practices. Following are a few key items that can help you be more successful.

1. Standardize your mapping table and store a copy of it with your firm's standards. In this mapping table make sure all categories are pointed to the families you use on typical projects. This will help you get up and running a lot faster and will also standardize your firm's process.

2. One would think that the shifting of a grid line would be a change to the model. Unfortunately, at this time a grid line shifting in the model is not recognized as a change—even though members physically move and connecting members' length changes.

3. The ISM plug-in was initially intended to be used to integrate the Analytical model with the BIM model. However, with ISM capabilities in multiple analytical applications there is no reason that the ISM technology couldn't be used to transfer models to other applications. For instance, you could use RAM Structural Systems to develop the framing for a building and then use ISM to transfer the building design to RAM Concept to design slabs, or transfer the building model to RAM Elements to design the roof trusses.

4. Being able to round-trip the design model is the ultimate goal that most firms would like to accomplish with the ISM technology. This is achievable with the Bentley ISM

applications; however, there is one major rule that MUST be followed to accomplish this—that rule being that you can't skip any steps.

Looking at this in more detail, if you started your model in RAM SS and then created the Revit model from the ISM Repository (like in the above example), the tendency of most would be that the framing for a bay is modified at a project meeting. So the engineer opens the RAM model, re-frames the bay, and updates the ISM Repository model. The designer then uses the ISM plug-in to update the model from said repository model. When they update the model they tend to get errors and warnings as the model updates.

The reason for this is that the team skipped an important step of updating the repository model from Revit. The issue when skipping a step like this is that each element is assigned a unique ID number when it is initially brought into Revit. That is how Revit keeps track of members' placement and other important properties. If the cycle is not broken, there is a much better success rate in round-tripping the BIM and analytical models.

5. When round-tripping models between Analytical application and BIM, make sure to keep the repository model name the same. It is common practice for engineers to have multiple copies of a design (this is done to "test" different scenarios of their design during early phases of a project). When the design is ready to be transferred to BIM, the same file name needs to be used to successfully round-trip models. Probably one of the first best practice standards that your BIM manager and production team need to address when setting up a standard is the naming convention for round-tripping workflows.

6. Another key to successful round-tripping from BIM to Analytical (or vice versa), is for the engineer to run a "data check" on the model when updating the model from Revit. This can be a frustrating and time-consuming process depending on the type of structure you are working on. I have seen the round-tripping workflow work before, but it is mostly in a controlled project environment. Projects that have typically had the most success in round-tripping the model were simple structures such as MOBs, hospitals, and office buildings. Where round-tripping has run into complications are industrial facilities where members are slopped more often. The reason is that the modeling techniques are different in Revit than they are in RAM.
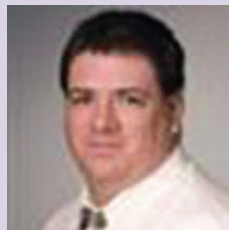
Kenn Farr is the BIM Manager for Teasley Services Group and has more than 24 years of experience in modeling, development, and implementation of technology.

CAD Manager

by: Mark Kiker

Tech Manager = Task Master

We are all swamped with things to do. Not just Tech Managers, but everyone who is reading this. We feel like our boat is sinking under the tidal wave of tasks and we can't bail out the water fast enough to stay afloat. There is more on your plate that last year or even last week. More gets piled on. More is coming. More projects, more software, more people. More, more, and then more. Everyone I talk to has a long "to-do" list that is getting longer. "Do more with less," the boss tells you. Get on board with the "lean organizational focus" of today.

What are we to do? Can we stem the flow of all the requests we get? Can we stop the flood of needful staff that can't get software or systems to work as expected? Will there ever be a break in the avalanche of upgrades to an ever-expanding list of apps in use today?

I am not encouraging you to be an evil taskmaster by passing all your low level tasks off to some junior employee and then cruelly force him or her into servitude. Even if we wanted to do that, there is usually no one else to lay these burdens on. No, I am encouraging you to master your task list. Be a Task Master by mastering your tasks. Note: not to be confused with the super villain from Marvel Comics or the UK television comedy show.

I have encouraged you to make lists and have tasks defined, but now I want to suggest tools that you might use to manage those tasks. I have used some tools that have helped me, but I have not found an all-inclusive app that does it all. But along the road of my search there have been some digital and paper-based processes that have helped. I have asked many others how they manage their to-do list. I have collected ideas and tried many. Yet I still find things that have fallen through the cracks and are forgotten until the requesting person reminds me. It is frustrating and I still search for the best way to keep things from being missed.

So let's jump in and see what is out there that you can try. Some of these I have used and some I have not. Some I have tested and others I have just heard about. Some have been recommended to me by others. Your research should be driven by your defined needs and not mine. This is not an exhaustive review of any tool, but just a peek into the mounting offerings that are out there to help you get things done.

STICKY NOTES – DIGITAL AND ANALOG

Yes, I use sticky notes. In fact, most of my task list starts from a paper sticky note. There are stuck all over my desk (but not on my monitor). I keep a sticky note pad with me whenever I go

to meetings and I jot down ideas, tasks, dates, and such—even when I am taking digital notes on my PC. Later I review them and move them to another tool that allows me to set reminders. I do not use the Windows Sticky Notes tool… again, no sticky notes on my monitor.

OUTLOOK – CALENDAR AND TASKS

As mentioned in previous articles, I use my Outlook calendar for many things, including tasks that I need to be reminded about. I put them into my calendar as appointments, with reminders set to let me know of an approaching deadline. Someone gave me the tip to set the start and end time of the event/task to the same time— zero minutes in length. That way your calendar does not look "full" to others who may need your time. Wait, maybe I *do* want it to appear full so no one can ask me for my time… oh, well.

I have not gotten into the habit of using Outlook Tasks. I just have not set up a consistent workflow that has me putting in tasks and then managing them. I know that I can set reminders, but I just have not made Tasks part of my routine. It might work for others, but not for me. As I am writing this, I went and checked my Tasks in Outlook and they are all overdue and ignored. I try to use it, but to no avail. Same thing with Google Tasks—not using it.

TODOIST

This has been around for a long time and I know many people who use it. It has a simple design and works on many devices, collaboration on shared tasks, notifications, and subtasks. There is a free version, but to get reminders, you need to get the premium tool. People rave about it helping them, but I have never added it to my arsenal.

SMARTSHEET

This is project management and task tracking software that has easy-to-use Gantt charting and dependencies—one task flows into the next. Ease of use, clarity of interface, and advanced features are included. Assign tasks to team members, collaborate on developing project flow, and more. I have been using this tool for some time and it is great for mapping out timelines and Gantt charting projects. There is a free trial, but this is a paid tool. It integrates with Google for single sign-on.

WRIKE

Timeline and Critical Path are part of the Project Management tools in Wrike, but task management is at its heart. Easily manage your daily work by dragging tasks around from "Today," "This week," "Next week," or "Later." I hear good things, but have not tried this tool yet.

EVERNOTE

While Evernote may not be a classic ToDo list kind of tool, it does allow you collect everything in one place. Notes, reminders, photos, web pages—just about everything you can think of. All available on any device you might have. Google Single sign-on and other features make it easy to use. I have used this for years—not so much as a task list creator, but as a collection point for many items I have scattered about.

PRIORITY MATRIX

I am investigating this one now. It is based on the Eisenhower method of defining quadrants and placing tasks in areas based on time, urgency, necessity, and more. It is a prioritization tool that allows you to move things from one quadrant to another by drag and drop. You can set due dates and reminders. There is a collaboration feature that allows you to share task lists. Free trial leading to a paid subscription model.

Others that have been mentioned to me include: Centrallo, easynot.io, MeisterTask, PinTask, ToDo Cloud, TrackingTime, and Trello. Then there is also HiTask, Nirvana, Remember the Milk, and Zendone. Some are free and some are paid.

I am sure there are more and I encourage you to email me some of your ideas and tools that you use. The ones you are using might not even be on my list. "How could you forget…" could be in your mind right now. Whatever you do to help you remember tasks and not let things fall through the cracks will make your life easier and those you support very happy.
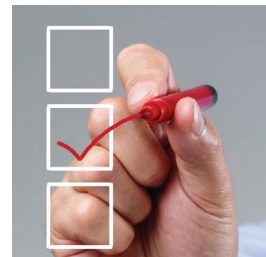
Mark Kiker has more than 25 years of hands-on experience with technology. He is fully versed in every area of management from deployment planning, installation, and configuration to training and strategic planning. As an internationally known speaker and writer, he is a returning speaker at Autodesk 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.

Improve Your Water Distribution Workflow with PressureCAD

When Autodesk introduced Pressure Pipes in AutoCAD® Civil 3D® 2013, I was always asked when the analysis portion was coming out. I figured it would be right behind, but Autodesk has yet to come out with anything in the software. So I decided to take that on myself, with some help from people WAY smarter than me! I wanted an add-on that let you utilize the pressure pipes from Civil 3D for a dynamic water model.

The result is PressureCAD, which bridges the gap between AutoCAD® and Civil 3D and your water distribution analysis workflow.

This article takes a quick look at PressureCAD, which can be found in the Autodesk® App Store or by going directly to www. PressureCAD.com.

Figure 1

ABOUT PRESSURECAD

PressureCAD is built off of EPANET, the industry-standard engine for water distribution modeling, and works directly within your AutoCAD and AutoCAD platform products such as AutoCAD Civil 3D.

PressureCAD is simple to use and produces professional results quickly and easily within your AutoCAD products. No more going back and forth between design and analysis software—simply design your distribution network and analyze as you go.

AutoCAD Integration

With a simple ribbon interface, PressureCAD installs directly onto your AutoCAD software (Figure 2). Even without the robust modeling of Civil 3D, you can get instant results from PressureCAD by laying out your network with lines and nodes.
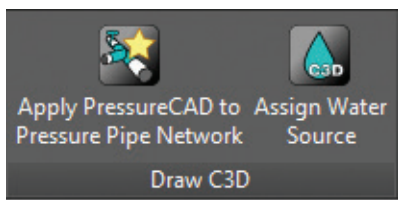

Figure 2

Civil 3D Integration

PressureCAD also has full integration with the Civil 3D pressure pipe modeling tools. Simply model your network using the pressure pipe tools, apply your PressureCAD settings, and analyze the results quickly and easily. Take your BIM model further with PressureCAD.

And the best thing of all: UNLIMITED pipes and nodes!

It is a very simple download and install and just adds another tab to your ribbon (Figure 3). You are up and running within moments.

KEY FEATURES

Settings

The Settings options allow you to set up the model parameters, defaults, and min/max values. You can modify your Hydraulic settings and time settings as well as change your pattern curves and all curves for pumps, volumes, headloss, and so on.

Draw (AutoCAD)

There are two options in PressureCAD for drawing and analyzing your system. The first option can be done in plain vanilla AutoCAD, or any AutoCAD platform product from 2012-2018. This allows you to draw your pipes, water supply, and all your nodes while also being able to read a Civil 3D surface (Figure 4). This works great for those who have not yet utilized the Civil 3D pressure pipe module.
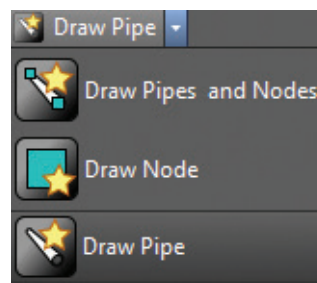

Figure 4

Draw (Civil 3D)

For those who use Pressure Pipes inside Civil 3D, all you need to do is simply "Apply PressureCAD" to your existing network and you are off and running! With one click of the button you can apply EPANet data to your model.
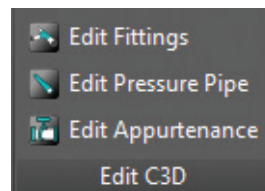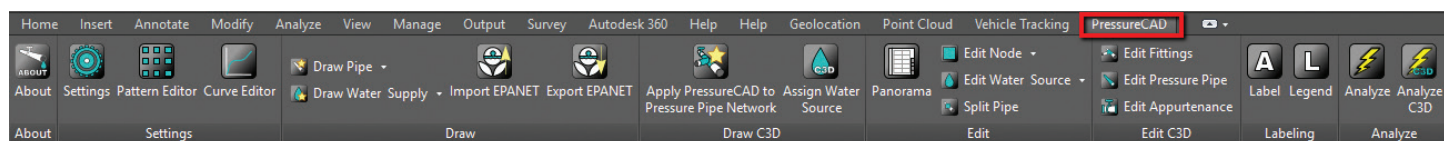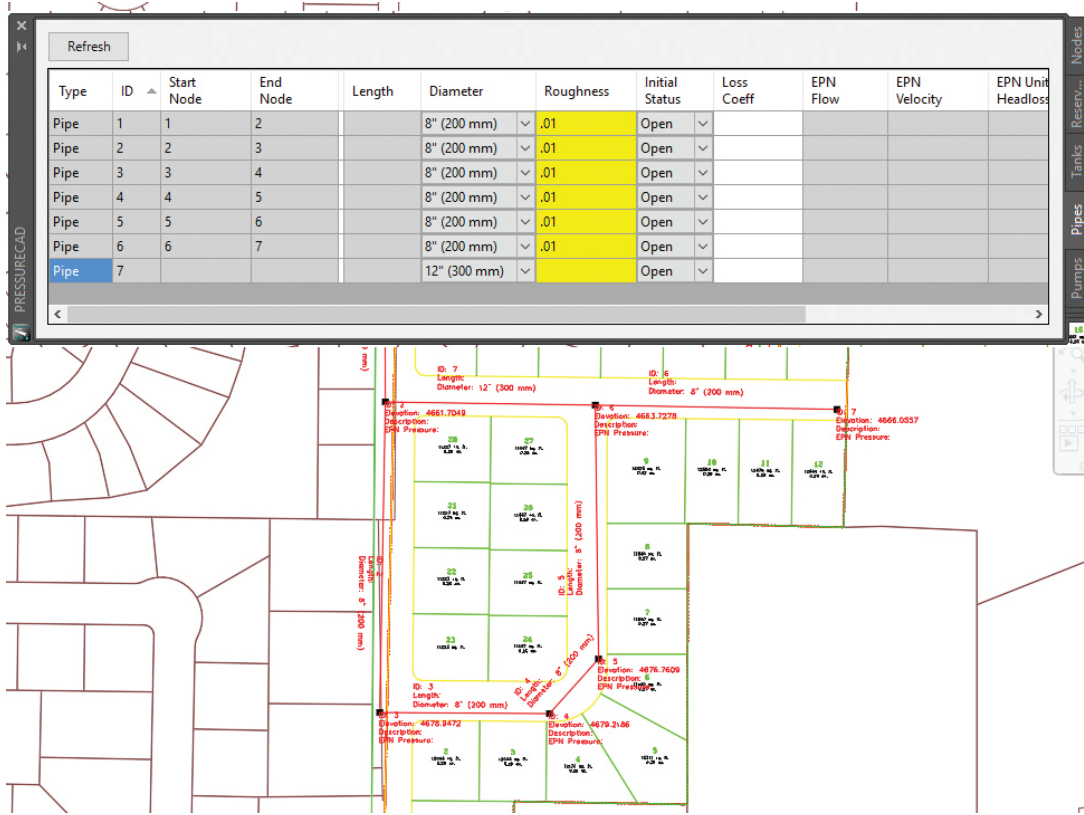

Figure 5

Figure 3

AutoCAD Civil 3D 2018

Figure 6

For either option, there are three types of analysis you can perform.

- Steady State
- Extended
- Fire

Integration with EPA-Net

As mentioned earlier, PressureCAD is built upon the EPANet engine, and with that in mind, we also included the option to directly import EPANet files and export out to an EPANet file (Figure 7). This will help in the transition to PressureCAD or to share files with those using EPANet.

Figure 7

Editing in the Panorama

Use this one-of-a-kind panorama to view all the data within your network in real time. Select a line item and zoom directly to that item in plan view. You get all your model properties and analysis data in one location where you can easily pinpoint problem areas and adjust directly from the panorama.

This was a late addition to PressureCAD, but is really popular with users.

Labeling

Simply create a label by adding any information you wish to see on your plan. By using the label composer, you can add any data necessary directly to your plan view for quick and easy report exhibits.

You can label all nodes, pipes, and other features by using the Label Composer dialog box. You can also add a simple legend to your drawings as well.

Analyze

- <u>ANALYZE</u> – Use this icon to perform an analysis of your network if using the AutoCAD-based product.
- <u>ANALYZE CIVIL 3D</u> – Use this icon to perform an analysis on your pressure network model inside Civil 3D.

CONCLUSION

PressureCAD may be the new kid on the block, but the tools work great for projects of all sizes. The software can fit right into your workflow and you could even add to the code if you get a little adventurous! Check out some of the videos on the App Store or on www.PressureCAD.com.

I would love to hear from you regarding this add on and I appreciate any feedback you may have.

Shawn Herring has been a part of the design engineering community for roughly 12 years in all aspects of design, construction, and software implementations. He has implemented and trained companies across the country on Civil 3D and other infrastructure tools and their best practice workflows. Shawn can be reached for comments or questions at awautocadcivil3dcm@augi.com.

THE RIGHT PRICED TOOL FOR THE JOB

MTower™ 2P64X & Render™-RT

"Blew Away" the competition by nearly 100% on the AutoCAD®Render Test -Desktop Engineering 25%+ Higher Clock Speed but 25% less expensive than comparatively configured HP, Dell & Lenovo Intel®XEON®based Workstations.

NVIDIA PREFERRED SOLUTION PROVIDER

NVIDIA. QUADRO®

DE Digital Engineering Editor's Pick of the Week

PowerGo™

"On the SOLIDWORKS® test, the Xi® PowerGo XT was the clear winner, surpassing every other mobile workstation we have ever tested"-DE-11/16. Xi PowerGo 15/7 with NVIDIA **Quadro P3000 is the DE Editor's pick of the week April 2017.**

25th 1987-2012 Anniversary

WebRAIDer™& NetRAIDer™64X

The most cost effective building blocks for converged storage, simulation, virtualization and HPC computing solutions.
1U to 6U Rackmount unsurpassed scalability to **64cores** XEON,1TB DDR4, 112TB Storage, **Eight** NVIDIA®Tesla®P100 or Quadro®P6000.

intel® XEON® inside

MTower PCIe

Award winning CAD desktop workstation designed to streamline the most demanding workflow. Quiet, powerful, compact, cost effective and **with the new Intel i7-7700K @ 5.0GHz clock, truly the fastest workstation in the world!** Custom built in the USA.

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

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

@Xii®

www.xicomputer.com
toll free: 800-432-0486

by Robert Green

Z2 Mini Workstations in Action

The HP Z2 Mini Workstation has been getting a lot of attention lately due to its robust specs and tiny size. At just 8.5"x8.5"x2.3" in size with the latest generation of Intel® Core™ and Xeon® processors[1,2] (including the 4.0 GHz Intel® Core™ i7 6700), up to 32 GB of DDR4 RAM[3], HP Z Turbo Drive G2 solid state drives[4], and an available NVIDIA® Quadro® M620 GFX graphics subsystem driving up to four[5] (4) 4K monitors there's no doubt the Z2 Mini Workstation punches above its weight.

But beyond the theoretical specs, how are Autodesk users utilizing the HP Z2 Mini and what have their experiences been? In this edition of Tech Insights we'll talk to Michael Ashley, Principal, Studio Libeskind, about their use of the HP Z2 Mini Workstation[6] on their latest projects.

THE INTERVIEW

RG: Michael can you tell me what your company designs and what Autodesk tools you use the Z2 Mini Workstations for? Also, how do you configure them?

MA: *We're an architectural firm doing large building design projects so we deploy a lot of different software. With Autodesk we're using AutoCAD, Revit and 3ds Max. We're using 32 GB of RAM, solid states discs and the NVIDIA graphics cards.*

RG: It sounds like you are a high end, aggressive Autodesk architectural shop environment then?

MA: *Yes. We try to use as much of the technology that's out there as we can and the Z2 Mini's are performing well no matter what we throw at them.*

Daniel Libeskind, Founder and Principal Architect, Carla Swickerath, CEO and Principal and Michael Ashley, Principal

RG: How long have you been using the Z2 Mini Workstations? Any problems so far?

MA: *About eight months now. No, no problems. It was pretty much just plug in and go.*

RG: Are you happy with the Z2 Mini's performance?

MA: *Yes. Completely happy and satisfied. They fit right on top of your desk but they're performing like any of the towers that I've used in the past. You know I was surprised honestly - I wasn't expecting too much. We work fast and push a lot of simultaneous demands on these machines. We're running AutoCAD, Revit and another graphics application like Photoshop or 3ds Max at the same time. Most users leave the machine on all week long and just flip from one application to the other and the Z2 Mini has no problems with any of them. All these factors make the Z2 Mini a quality product.*

RG: Let me ask about rendering for a moment. What have been your observations in terms of the 3ds Max performance?

MA: *We have some bigger tower workstations in the office that we use when we do heavy rendering but for quick test renders and screen views the Z2 Mini handles it fine. Of course, it depends on what your scene has in it, how many lights, how many materials, how big the model is, etc. but the Z2 Mini's have been able to handle the small renderings we need to do quickly.*

RG: Have you used the visualization inside the CAD tools themselves?

MA: *Absolutely. We work in shaded mode or rendered mode most of the time, actually. No problems.*

RG: Was the Z2 Mini easy for you to deploy? Was it less disruptive than getting all new traditional tower workstations?

Occitanie Tower in Toulouse, France designed by Studio Libeskind on the HP Z2 Mini Workstation. Image courtesy of Luxigon.

MA: *Yes, because they're small and physically easier to handle and you're on top of the desk instead of crawling underneath it and that makes deployment simpler in that effect. You can carry several at once, it's not like lugging in one tower at a time.*

RG: Is the user perception better because the Z2 Mini is taking up less desk space and is quiet?

MA: *More that they're really quiet. You don't even notice if they're on or off plus they sit on top of the desk which is handy for USB drives. And you have more leg room underneath your desk with no computer blowing hot air on your legs all summer.*

RG: Are you using the Z2 Mini's for traveling workers at all or you treating them just like stationery desktop computers?

MA: *No, we don't travel with them. They're stationery. I can see how it would be easy to travel with them but we depend on laptops for that.*

RG: Is there anything that surprised you after the Z2 Mini installations?

MA: *Just the performance of them in the small package is what I've heard from most of the others in the office. We weren't expecting a lot out of these machines but we gave them a test drive, put our foot on the gas and they really hold up.*

RG: If you had to pick one thing, what do you love the most about the Z2 Mini?

MA: *Actually how quiet and cool they are. No fans, no heat - it's really quite nice.*

RG: Thank you for your time today Michael.

MA: *You're very welcome.*

Figure 1 - HP's Z2 Mini provides workstation power in an elegant, small enclosure.

SMALL IS BIG FOR LIBESKIND

As you can see from our interview conversation the HP Z2 Mini excels in Autodesk centric architectural environments. From modelling, to annotation, to rendering and beyond the Z2 Mini delivers tower performance in a small, quiet and cool package that takes up hardly any desk space.

With the HP Z2 Mini Workstation your Autodesk users can have the performance they want, the ergonomics they deserve and your IT department can be confident that deployment will be easy. And, of course, HP quality, reliability and 3-year limited warranty are all a given.

ABOUT HP

HP helps you stay ahead of the curve with professional desktop and mobile workstations designed for large and complex datasets, dispersed teams, and tight deadlines. HP Z Workstations deliver the innovation, high performance, expandability, and extreme reliability you need to deliver your 3D CAD projects in less time. To learn how to configure a HP Z Workstation, visit the HP and Autodesk page at www.hp.com/go/autodesk.

ABOUT ROBERT GREEN

Robert Green provides CAD management consulting, programming, speaking, and training services for clients throughout the United States, Canada, and Europe. A mechanical engineer by training and alpha CAD user by choice, Robert is also well known for his insightful articles and book, Expert CAD Management: The Complete Guide. Reach Robert at rgreen@greenconsulting.com

1. Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering is not a measurement of higher performance.
2. Intel® Xeon® and Intel Pentium processors can support either ECC or non-ECC memory. Intel® Core™ i5/i7 processors only support non-ECC memory.
3. Each processor supports 2 (Intel® Core™) or 4 (Intel® Xeon®) channels of DDR4 memory. To realize full performance at least 1 DIMM must be inserted into each channel. Actual memory speeds dependent on processor capability.
4. For hard drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for system recovery software.
5. 6 display functionality delivered via the combination of NVIDIA® Quadro® M620 graphics and Intel® HD 530 or P530 graphics. 6 display support only available on the Z2 Mini Performance base unit.
6. Studio Libeskind was provided products by HP.

3ds Max 2018

by: Brian Chapman

Covering Details

I t's the small details in a scene that matter. In most cases people won't notice them. Generally, that means we've done our job. When people notice details missing, that's when we find ourselves scrambling for solutions. To avoid that, I'd like to present some examples of ways details can be applied to our scenes to better our product.

GET ARTSY

Those of us in the AEC industry often lean toward the quick and easy solution. Interiors might consist of a painting, some books, sofas, or any other item generally floating around a house. While budget might not permit it, you may wish to spend some extra time working on more personable features that add interest to a scene, such as the example shown in Figure 1.

Figure 1

This example took only a few minutes to create. First, I found a vector image of a palm tree and applied it to a plane in 3ds Max as a texture. I traced the tree with a spline then converted the spline to an editable poly and applied the shell modifier to give the tree thickness. After that, I simply had to construct a frame.

GET FURRY

The Hair and Fur modifier in 3ds Max® can provide an extraordinary level of detail to an ordinary object. See Figure 2, for example. The object on the left might be appropriate for more applications, but by using the Hair and Fur modifier we are able to create a creature that viewers might find more interesting. The modifier can be used to generate grass, lint, and more in addition to having built in preset styles.

Figure 2

To access the preset styles provided with the Hair and Fur modifier, select the modifier and scroll down to the Preset category, then select load. You'll find the examples in Figure 3.
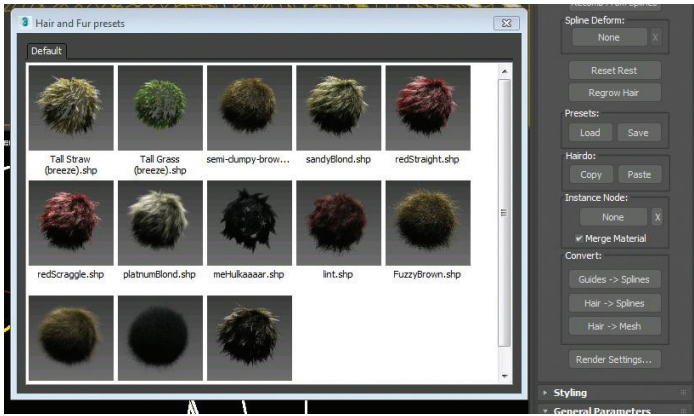
Figure 3

GET MOVING

I probably can't overstate the importance of the illusion of action in a scene. There are multiple reasons for adding activity to a scene, but I'll list a few. Take people, for example. Adding people to a scene gives viewers something to relate to. In addition, it gives them a scale to measure by, a point of reference. It helps to remember that in life, no matter where we go there is likely some sort of activity stirring around. In most cases our product should reflect that. See Figure 4 for an example of how simple action in a scene can make it appear more interesting.

Figure 4

GET FOCUSED

In many cases we need to draw attention to the proper object in a scene. This can be accomplished by using the focus feature in the 3ds Max camera settings or by positioning objects in a way that leads the viewer's eye to that particular object. Other ways include adjusting the perspective, altering colors and contrast, through positioning of the elements, convergence (lines or edges pointing directly to the object), and more. The image in Figure 5 demonstrates several of these features. Notice that while there are a multitude of rocks (details) in the image, our eye is still drawn the one in the center. It's worth noting if we removed all the surround-

ing rocks, this one might appear out of place. Right now, the scene appears both natural and full of detail.
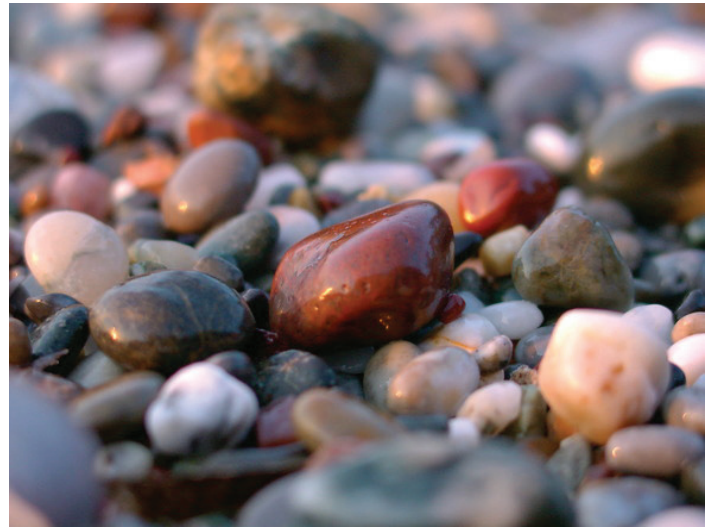

Figure 5

GET UNUSUAL

Making a particular object stand out is a very good way to draw viewer's attention away from the surrounding details while we work to make the scene appear less empty. See Figure 6 for an example.

Figure 6

Brian Chapman is an Autodesk Authorized Developer, creator of Pro-Cad.Net and Senior Designer for Slater Hanifan Group, a civil engineering and planning firm dedicated to superior client service. Brian can be reached at procadman@ pro-cad.net.

LotSpec: Options Management App for Production Home Builders

Production home builders face the challenge of managing countless predefined options, which they offer to create a custom home building experience for potential home buyers, and to avoid the "cookie-cutter" cliché. To manage these options, many home builders and plan service providers employ workflows that involve complex variations of nested Xrefs, Layer States, or Dynamic Blocks while often discarding the bedrock feature of AutoCAD® Architecture that is Project Navigator.

LotSpec, a free App for AutoCAD Architecture available on the Autodesk® App Store, provides an elegant solution for production home builders to manage options and automatically configure option-specific plan sets. Within the context of an AutoCAD Architecture project, LotSpec provides tools to define a list of available options, assign Option Rules to individual or groups of drawing objects, and "Solve" drawings for viable combinations of selected options, all while seamlessly integrating with Project Navigator.

Essentially, LotSpec is a rule-based floor plan configurator built on principles of Boolean logic. Each option in a project is assigned a code, used to form option rules. Option rules are statements composed of option codes (the variables) and logical operators such as AND, OR & NOT, if needed. Option rules are applied to individual or groups of objects within project drawings; they instruct LotSpec during the Solve process.

The solve process copies drawings, evaluates option rules against user made option selections, returns a True/False result for each rule, and instructs LotSpec to either Move, Stretch, Delete, or Ignore drawing objects accordingly. The product is an option-specific plan set reflecting home buyer selections, done in a matter of minutes. Let's take a closer look.

OPTIONS PALETTE

On the LotSpec ribbon tab (Figure 1), the Edit Options button displays the Options palette (Figure 2), from which the user can

manage Option Groups and Option Selections for the active project. Option groups are used to organize option selections, and consist of a sort order, name, selection settings, and a default option when the group requires that a selection be made. Option selections represent the predefined options available to home buyers, and consist of a name and a code, which is used in forming option rules as mentioned above.

In addition, both option groups and selections may have an option rule applied to them. These rules are used to limit selection availability based on other current selections, preventing the user from mistakenly selecting a nonviable combination of options. For example, as seen in Figure 2, the "Bedroom 4" option has a rule of *Not office*, and the "Office" option has a rule of *Not bdr*. These rules prevent both the Bedroom 4 and Office options from being selected at the same time. If either option is selected, the other will be disabled.
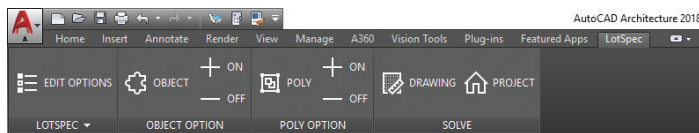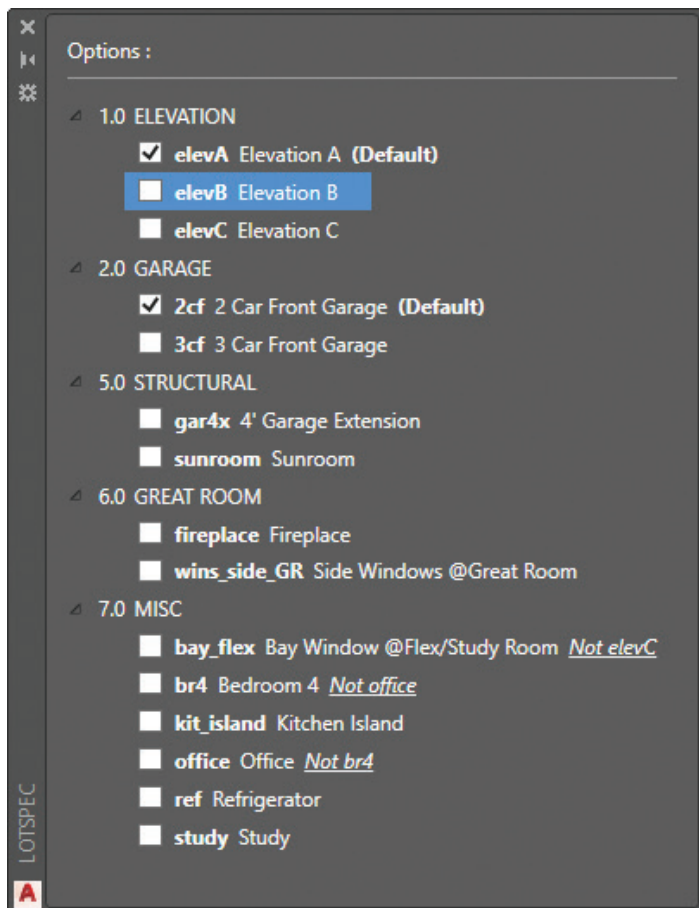

Figure 1: LotSpec ribbon tab

Figure 2: LotSpec Options palette

POLY OPTION

The primary device used to apply option logic within a drawing is the Poly Option tool. When using this tool, objects are displaced from their intended location in the drawing and enclosed with a polyline. The polyline is assigned an option rule, along with displacement points indicating where objects should be moved from/to (Figure 3). During the solve process, poly options are evaluated against selected options. Objects within poly options that return a positive result are moved according to established displacement points, whereas objects within poly options returning a negative result are deleted.
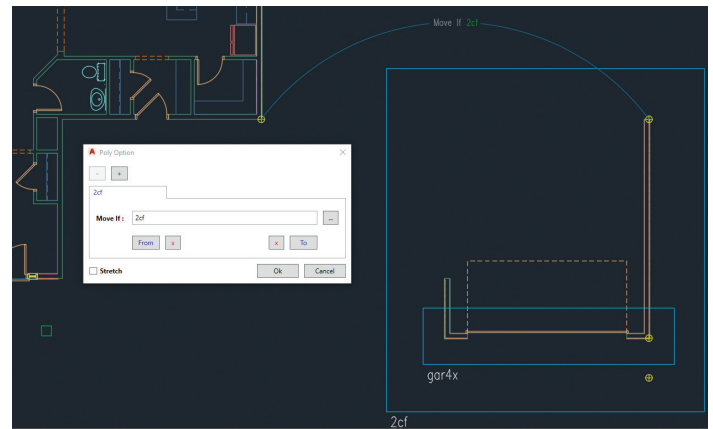

Figure 3: Example poly option for "2 Car Front Garage" option

Figure 4 shows a sample floor plan with many poly options defined. Each blue box represents a poly option, while adjacent arcs highlight the from/to displacement points. Objects in the middle of the drawing (not enclosed by a poly option) are the core features of this floor plan; they are unaffected by the solve process regardless of which options may be selected.
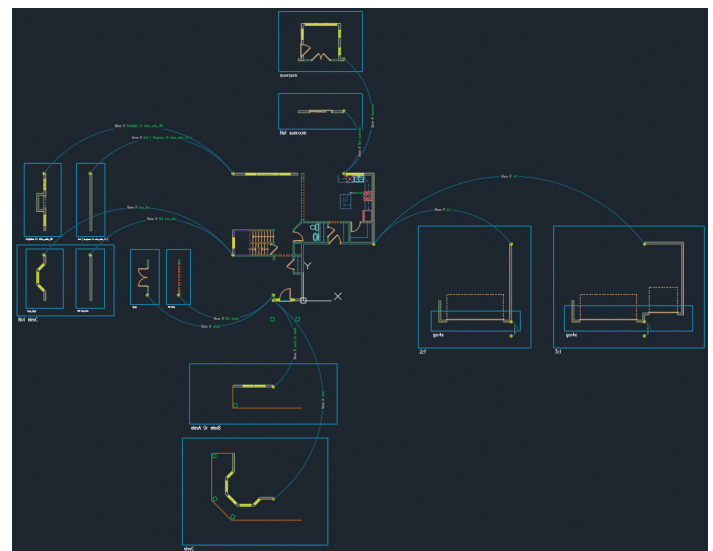

Figure 4: Unsolved floor plan with Poly Options labeled

Poly options can also be used to stretch objects rather than move them during the solve process. The poly option dialog (Figure 3) has a Stretch checkbox used to indicate the stretch. All principles of the move poly option apply to the stretch poly option; the difference being that objects are stretched rather than moved in the case of a positive result, and ignored rather than deleted in the case of a negative result. Figure 3 shows a stretch poly option used to stretch the garage when the "4' Garage Extension" option is selected, "gar4x" is the option code/rule in this case.

OBJECT OPTION

The Object Option tool is used to apply an option rule directly to drawing objects in their current location. As seen in Figure 5, the kitchen island block has a rule of 'kit_island' applied to it. This object option instructs LotSpec to delete the kitchen island block during the solve process if the "Kitchen Island" option is NOT selected, or in other words, to "Keep If" the "Kitchen Island" IS selected.

Object options are most effectively used with on/off option scenarios, meaning options where no alternative exists for that location, just like the kitchen island. On the other hand, when multiple alternative options exist for a single location, using the poly option tool to displace objects is more effective.
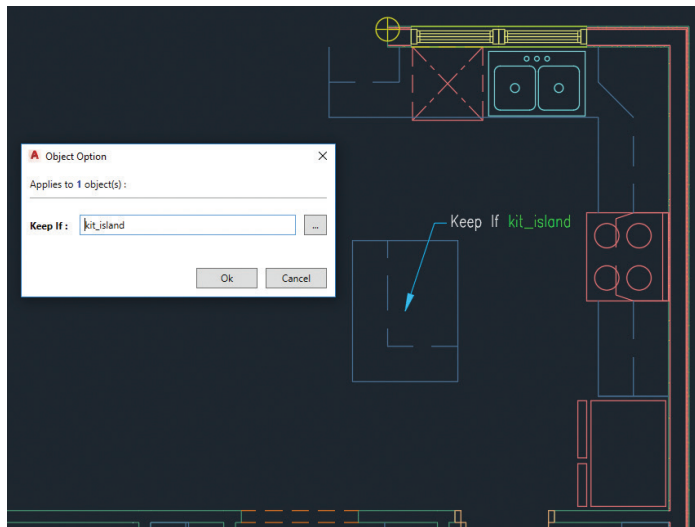

Figure 5: Object option applied to kitchen island block

SOLVE DRAWING/PROJECT

After a list of options has been defined and option logic established within project drawings, the Solve Drawing and Solve Project functions can be used to configure option-specific plans. Solve Drawing, as the title infers, is used to solve a single drawing, and is typically used to test work in progress on the active drawing. Solve Project is used to solve all drawings within a project at once, and to test work in progress, especially in 3D projects where sections and elevations are generated automatically from multiple solved con-

structs. However, the ultimate purpose of the Solve Project function is to generate option-specific plan sets that reflect home buyer selections. This is used for permitting and construction purposes.

Both Solve Drawing and Solve Project functions initially prompt the user with an option selection dialog (Figure 6). When using Solve Project, or if the active drawing contains Xrefs, the selection dialog will also include a list of project files (Elements, Constructs, or Views) to be solved.

After the user has clicked OK, each of the drawings to be solved are copied to a Solved category within their respective classification (Element, Construct, or View), and appended with a "-SOLVED" suffix. The "-SOLVED" drawings are then opened and configured (or solved) according to selected options and existing option logic established within each drawing. As shown in Figure 7, the resulting solved drawing is a complete floor plan configured to reflect selected options. When solving Section/Elevation type Views, LotSpec automatically refreshes all Section/Elevation objects to reflect solved Xrefs. LotSpec works with both 2D and 3D projects alike.

The option selection dialog (Figure 6) also includes a Mirror Plan checkbox. When mirror plan is checked, after each drawing is solved, LotSpec automatically mirrors all objects in the drawing about the zero-zero axis, with mirror direction determined by the Rotated Plan project setting. Mirroring a floor plan is common as lot conditions often require a specific garage orientation (Garage-Left versus Garage-Right).
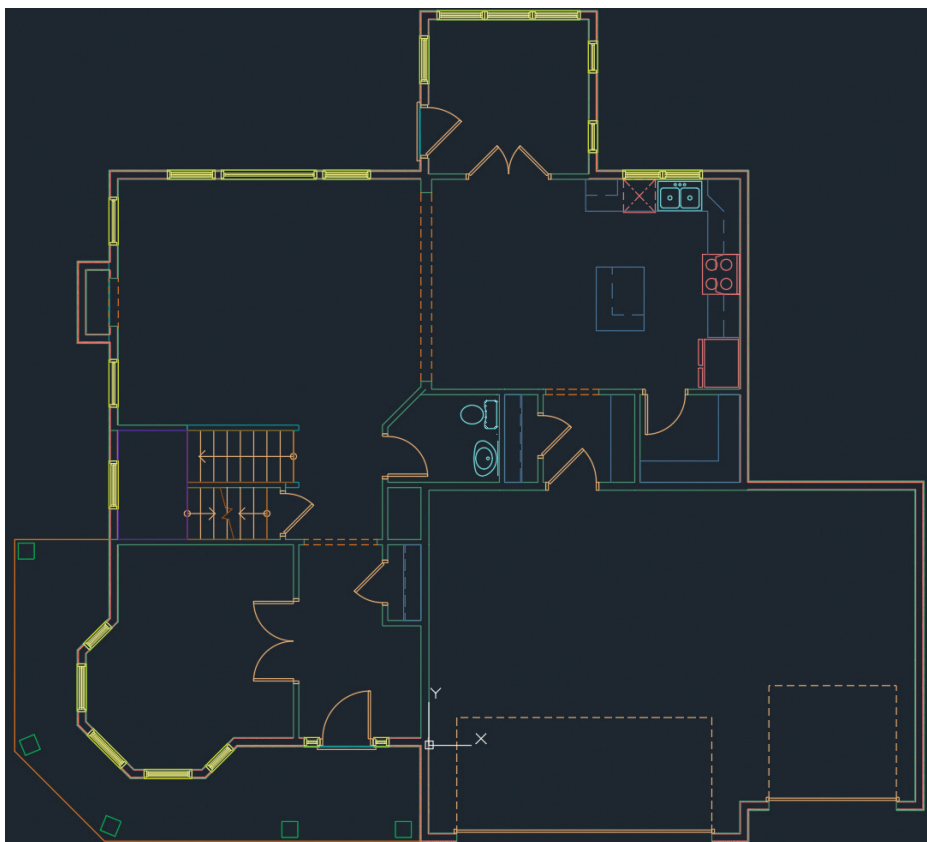

Figure 6: Solve Drawing dialog

Figure 7: Solved drawing reflecting selected options

The Pro version also adds functionality to execute Solve Routines during the solve process. Solve routines are custom commands that can be run during various stages of the solve process (pre-project, pre-drawing, post-drawing, and post-project). As an example, built into LotSpec Pro is an automatic dimension command that can be used as a post-drawing solve routine. The automatic dimension command works by detecting blocks placed by the user to indicate exterior openings and wall jogs. After each drawing is solved, the routine finds these blocks and automatically dimensions the exterior based on a predefined dimensioning algorithm and settings specific to the drawing.

Lastly, LotSpec Pro includes a set of advanced option tools. These tools are currently limited to the Property Option and Style Option. The Property Option tool allows the user to assign optional values to object properties based on option rules. Similarly, the Style Option tool allows optional styles to be assigned to AEC objects. Property and Style Options are evaluated during the solve process, with optional values being assigned if the corresponding option rule returns a positive result. Coming soon are option tools for controlling the contents of Text and Attribute objects, Property Set values, and Dynamic Block parameters.

WORKFLOW

LotSpec follows the standard AutoCAD Architecture workflow in that Elements are referenced by Constructs, Constructs by Views, and Views are placed on Sheets. To automatically produce option-specific plan sets using LotSpec, the solved views are placed on sheets, which then represent the last solved configuration. When the time comes to create a permanent set of plans for a specific lot (or home buyer), the entire Base Project file structure is copied, creating a separate independent project. The new project is opened, and the Solve Project function is used to solve all drawings for desired options. If custom options are requested (ones that have not been predefined), the solved drawings can manually be edited as needed. At this point, the solved project has no dependence on the LotSpec App, and the unsolved base drawings may be purged to prevent overwriting of modified solved drawings.

LOTSPEC PRO

LotSpec Pro, also available in the Autodesk App Store, is a paid version of LotSpec that includes additional tools. Most notably is the addition of Option Sets, which are used to assemble Master Plan Sets that depict all available options for a particular project, commonly used for estimating and preliminary approvals. Option sets are predefined combinations of option selections and are managed from the options palette. They can be solved to create a library of pre-solved drawings, which are then placed on sheets to assemble the Master Plan Set.

LOTSPEC FOR REVIT

LotSpec for Revit® is currently under development and will be available on the Autodesk App Store within the coming months. LotSpec for Revit can be used independently of LotSpec for ACA, or in tandem as a hybrid solution sharing a single LotSpec option file. For a sneak peak at LotSpec for Revit, along with LotSpec for ACA training videos, please visit the LotSpec YouTube channel. https://www.youtube.com/channel/UCacLlR3Q0mQMpE_fCV1fX2A

Jonathan Albert is the Lead Application Developer and Founder of LotSpec. As a veteran of the Production Home Building industry, Jonathan has 20 years of experience dedicated to all aspects of "Rule Based" Options Management and Automation pertaining to CAD and BIM technology. Jonathan is a registered Autodesk Developer and can be reached for questions or comments at jalbert@lotspec.com.

Seven Songs about Scripts and How They Improve a CAD Manager's World

The first CD I ever purchased with my allowance money was the debut studio album by the Spice Girls. I remember playing it over and over on my boom box as I rode my bike around in a circle on the driveway. I soon acquired more CDs, and it eventually became a big issue for me as an eight year old to hop off my bike to manually change the CD when it was done playing.

Then one day, I discovered my dad had acquired a five-disc CD changer and my world was transformed. Everything was easier and more automated. I didn't have to take extra time to manually change the CD. I had a process that did the work for me, and I was able to go on with my day.

What does all this mean? It means that a very simple script is a lot like the five-disc CD changer in the story (except way more powerful). This article will show how simple scripts can help CAD managers reach their automation goals in a carefully selected playlist of Seven Songs about Scripts.

1. "WHAT'S A SCRIPT? (BABY DON'T HURT ME)"

The first song on the list asks the most important question. What exactly is a script? A script is a powerful tool that can be used to automate tasks for the aspiring CAD manager. The tasks can include copying and pasting files, overwriting files, backing up files, naming files, and more. Regardless of which Autodesk® product you are using, there can potentially be a lot of customization files to manage. For AutoCAD® MEP, having a custom CUIx file, custom Content Builder content, user profile, various automation files, tool palettes, etc. can yield more than 1,500 files to deploy. (I would know… I counted!)

Manually deploying all these files can lead to mistakes, not enough files being accounted for, and countless hours troubleshooting why your sweet custom setup just does not work on the end user's computer as well. You can write a script to automate the task of copying in files where they are supposed to go, so you don't have to do it manually. No fancy programs are required. You can simply use Microsoft® Notepad® (or Notepad++ if you have it) to create a simple script.

It is important to note that scripts are powerful and that is not something to be taken lightly. Incorrectly using scripts can potentially overwrite files you didn't intend to overwrite, and that will hurt. In this article, I will describe the approach I take to writing scripts. However, I highly recommend certain safety measures if you are new to the concept. In other words, don't try this at home unless you incorporate the following steps.

* Save scripts created in Notepad as text files (.txt) until you are ready to test. (Save as .cmd or .bat later.)
* Right click>Edit to edit any script that does not have .txt as a file extension. Simply clicking on a script file can run it!
* Set up local test folders so you can see what is happening when you run your scripts before you configure them to be the file paths you actually need them to be. This is the most important tip because syntax matters!

2. "DEPLOY ME MAYBE"

The next song on the list addresses how to use scripts to create a local deployment assembly pack, which is basically an assembly of all the files that will eventually be distributed. To do this, simply open up Notepad to make use of the following concepts shown in Figure 1.

Figure 1: Concept

Figure 1 shows three different ways to use Robocopy (or robust copy) to copy files from the source file path to the destination file path.

* Copy all contents of the source file path and put them in the destination file path.
* Copy one specific file from the source file path to the destination file path.
* Copy any files that have part of a file name from the source file path to the destination file path (this comes in handy if you don't want to spell out several specific files).

Creating a deployment assembly pack may sound redundant, but being in a CAD management role means I'm testing things all the time. I don't want to accidentally include test files or future development files while deploying content to others, so I make all my files copy into a nicely formatted deployment pack with subdirectories that house many different custom files. This deployment assembly pack acts as a final checkpoint before everything is sent to the server. This is important because once your files hit the server, they are considered "live" and ready for end users to retrieve. See Figure 2 for a simplified script on assembling a deployment pack for AutoCAD® MEP.

Notice there are a few additions to the main concepts shown earlier.

* REM to allow for embedded comments/notes that help with troubleshooting and ensuring everything is accounted for
* Options or switches like /e and /mir to tell the scripts to copy in all subdirectories and make the destination files look exactly

Figure 2: Deployment assembly script

how the source files look (mirror/overwrite if necessary)

* "Version" of the deployment pack, which is just a simple text file with the date and details of the update noted within it (Figure 3)

Figure 3: Deployment version

Following this script example will create a nicely formatted deployment assembly pack that pulls files from wherever you have them on your local machine. This deployment assembly pack will allow you to verify its contents in a well-organized way before it is sent to the server. Treat this script as something that is nice and beneficial to have, but not required. I mainly did this because I had reasons to keep many of the out-of-box AutoCAD file paths for my custom files to also reside.

3. "SEND THE FILES UP BEFORE YOU GO-GO"

Making hundreds of files available on the server makes it easier for rolling out deployment packs (read: your company standards), because any other method of distributing those same files could be very cumbersome. It is important to house these files on the server (for distributing purposes) because something could always happen to individual computers and local files where your customizations should ultimately reside.

As soon as you verify the contents of your deployment assembly pack, get them up to the server via a host to server script. Create a host to server script by simply writing the first Robocopy line from Figure 2 and modifying the paths so the source is your deployment assembly pack and the destination is your server deployment location path.

4. "BACKUP FILES THAT I USED TO KNOW"

It is important to get this next song stuck in your head because when you send files to the server, you also need to account for file backups of the "old" content that is already there. Your host to server script should make backups of old content before the new content from the deployment pack assembly gets sent to the server.

Figure 4 shows an example of how this is done. Notice that the first Robocopy line generates a backup file with the current date in a different location. There are other ways to format file names, but this is just one way to create a dated backup file with old content in it that you can easily reference if needed in the future.

Also notice that I don't have all content mirroring (overwriting) from the server deployment location to the server deployment backup location. I wrote the first line that way because I don't want the files to be overwritten. I want backup files to keep generating with all the respective subdirectories, so I do not have a /mir switch after that line. Now they're just some files I used to know.

5. "POWERSHELL™ SCRIPT OF THE HEART"

If you want to be extra crafty with your backup files, you may want to turn this song up. PowerShell™, another tool that is likely already on your computer, is a very powerful method for automating tasks through scripts. In fact, it is so powerful that its default settings actually prevent anything from running automatically with it.

Take note that with great power comes great responsibility. I want to address this in the topic of scripts because the .cmd files I'm showcasing have some limitations. More specifically, my backup files are rather large, and I want to compress and zip them. During my research, I did not see a way to do this exclusively with .cmd files and commands, so I looked into how to use PowerShell as another tool in my quest for automation.

As I mentioned, the default settings may prevent scripts from actually running through PowerShell itself. While you could change or bypass these settings, your IT department may discourage this action. For that reason, I looked into using PowerShell in an interactive way within my .cmd files.

Figure 5 shows how this is done. Keep in mind that for the sake of the screenshot, I just made the text wrap around to the next line. Otherwise, just placing content on different lines can make a difference, just like the order of content in your script can make a difference.

While PowerShell itself can be an article topic all on its own, the key takeaway is that there is a source and destination defined for the backup file to grab files and ultimately reside, a means to compress said file, and then some code to rename the newly created zip file with today's date.

I purposely showed a different way to format the date in the file name this time around. There are different possibilities in formatting the date because just telling the file to rename with the system variable %DATE% tends to come back with forward slashes (i.e., 03/08/2017), which is not allowed in Windows file names.

Now just add in your Robocopy line to retrieve and copy files from your deployment assembly pack location to your server deployment location at the end of this host to server script, and you won't be singing the blues much longer.

6. "SOMEWHERE OVER THE NETWORK"

Somewhere over the network, your files will fly. And your automation dreams will come true . . . as long as you write this final server to user script that gets everything onto any end user's computer.

This last step is crucial because your Autodesk software depends on it. The concepts and syntax are the exact same as Figure 2 except you are specifying the server deployment location as the source file path and the various file paths on your end user's computer as the destination file paths. Just like %DATE%, you can use %USERNAME% as a "placeholder" in your destination file path when you are trying to deploy files to any end user computer (i.e., C:\Users\%USERNAME%\AppData . . .).

This script is the one that the end user can click on and run to get the latest and greatest from the server. One point I want to add is that the end user might not know what a script is or what it is doing. For this reason, I added in one last bit of code to my server to user script that actually notifies the user with a popup message box that the transfer of files is done. In terms of syntax on Figure 6, it can be inferred that "echo" is just a means of displaying something, and in this case it is displaying the text that the user's AutoCAD MEP is up to date in a fun popup message box (Figure 7).


```
X:\Jisell Howe\AUGI World Magazine\HOST TO SERVER-AUGIWORLD.cmd - Notepad++
File  Edit  Search  View  Encoding  Language  Settings  Tools  Macro  Run  Plugins  Window  ?

HOST TO SERVER-AUGIWORLD.cmd

1    REM Creates Backup File of Existing Deployment Pack on the Server
2    robocopy "E:\Server Deployment Location" "E:\Server Deployment_Backup\Backup_%date:/=%" /e
3
4    REM Copies New Deployment Pack on the Server
5    robocopy "C:\Deployment Pack Assembly" "E:\Server Deployment Location" /e /mir
```

Figure 4: Host to Server script

Script #1 - DEPLOYMENT ASSEMBLY SCRIPT (copy & paste in a separate text file in Notepad)

Note: Don't forget to change file paths prior to testing!

REM Copies all your custom content to the Deployment Pack
robocopy "C:\Source" "C:\Destination" /e /mir

REM Copies the Version of Deployment Pack
robocopy "C:\Source" "C:\Destination" "*.txt" /e /mir

REM Copies the Tool Palette Group File
robocopy "C:\Source" "C:\Destination" "Profile.aws"

REM Copies the Tool Palette Files
robocopy "C:\Source" "C:\Destination" "somefile*.atc"

REM Copies the Tool Palette Image Files
robocopy "C:\Source" "C:\Destination" /e /mir

Script #2a – HOST TO SERVER SCRIPT (copy & paste in a separate text file in Notepad)

Note: Don't forget to change file paths prior to testing!

REM Creates Backup File of Existing Deployment Pack on the Server
robocopy "E:\Server Deployment Location" "E:\Server Deployment_Backup\Backup_%date:/=%" /e

REM Copies New Deployment Pack on the Server
robocopy "C:\Deployment Pack Assembly" "E:\Server Deployment Location" /e /mir

Script #2b – HOST TO SERVER SCRIPT-POWERSHELL (copy & paste in a separate text file in Notepad)

Note: Don't forget to change file paths prior to testing!

REM Creates Backup File of Existing Deployment Pack on the Server Using PowerShell
powershell -command "& {$source = 'E:Server Deployment Location';$destination = 'E:\Server Deployment_Backup\Backup.zip';&'add-type' -assembly

'system.io.compression.filesystem';[io.compression.zipfile]::CreateFromDirectory($source,$destination)}"

rename "E:\Server Deployment_Backup\Backup.zip" "Backup_%date:~-10,2%%date:~-7,2%%date:~-4,4%.zip"

REM Copies New Deployment Pack on the Server
robocopy "C:\Deployment Pack Assembly" "E:\Server Deployment Location" /e /mir

Script #3 – SERVER TO USER SCRIPT (copy & paste in a separate text file in Notepad)

Note: Don't forget to change file paths prior to testing!

REM Copies Deployment pack from Server to End User Computer
robocopy "E:\Server Deployment Location" "C:\End User Computer\Your Custom Setup" /E /MIR

REM Copies Tool Palette Group file to End User Computer
robocopy "E:\Server Deployment Location" "C:\Users\%username%\AppData\Roaming\Autodesk\MEP 2016\enu\Support\Profiles\Profile" "Profile.aws"

REM Copies Tool Palette Files
robocopy "E:\Server Deployment Location\Custom Files\Tool Palettes\AUGIWORLD" "C:\End User Computer\Users\%username%\AppData\Roaming\Autodesk\MEP 2016\enu\Support\WorkspaceCatalog AME (USImperial)\Palettes" "AUGIWORLD*.atc"

REM Copies Tool Palette Image Files
robocopy "E:\Server Deployment Location\Custom Files\Tool Palettes\AUGIWORLD\images" "C:\End User Computer\Users\%username%\AppData\Roaming\Autodesk\MEP 2016\enu\Support\WorkspaceCatalog AME (USImperial)\Palettes\images"

REM End of Script
echo msgbox "Your AutoCAD MEP is up to date!" > "%temp%\popup.vbs"

wscript.exe "%temp%\popup.vbs"

CAD Administration

Figure 5: Host to Server script using PowerShell

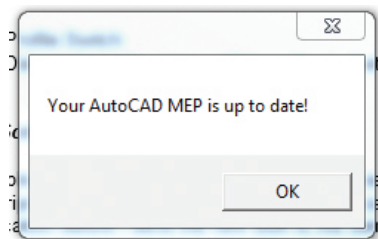Figure 6: Server to User script with message box

Figure 7: Message box

Keep in mind these scripts are just vehicles to transport files from one place to another. Additional setup may be required if you need AutoCAD on the end user computers to now read a bunch of new file locations for your custom content via a user profile. I created a copy of the AutoCAD shortcut and added a profile switch (See Figure 8), so it always runs the user profile I tell it to run.

The user profile drives a lot of the AutoCAD Options file locations, and it's imperative that the end user's AutoCAD setup is pointing
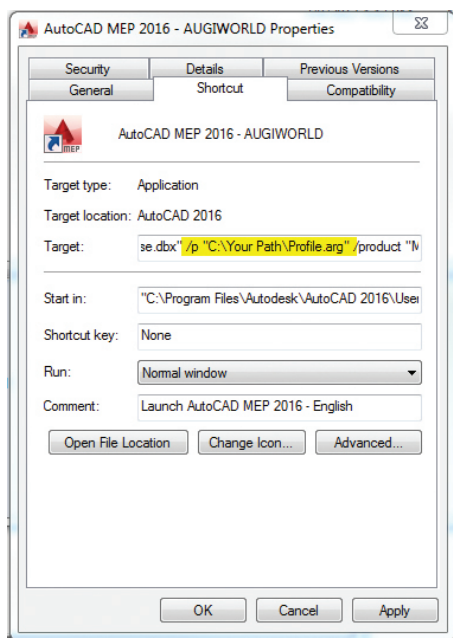

Figure 8: AutoCAD shortcut properties

to the correct file locations to run everything smoothly. I include this modified shortcut in my deployment pack for the end user to use when everything is deployed. Once these final points are squared away, you'll have reached the end of the rainbow where there are all sorts of other opportunities to use scripts for automation.

7. "CAN'T STOP THE SCRIPTING!"

Scripting is my jam, but I am still learning ways to improve them for my automation goals. If you are looking for more information on how scripts work and how you can add more functionality to your own scripts for automating the deployment of custom Autodesk files, there are multiple forums and websites that talk about script syntax and more.

Because these tools are available already via Microsoft, it is beneficial to check out their Virtual Academy and other Script Center resources. All the script examples shown here are available as a download if you want to explore the possibilities. I have purposely kept the file paths as simple as possible because my goal is to illustrate the concepts without bogging people down with exact file paths that you need to ultimately configure yourself.

In short, scripts can be a great tool to add to your toolbox if you are looking to go from being dazed and confused to being dazzled and amused. So go out there and script away, but be sure to follow the proper rules of engagement to ensure you don't wind up being an 8-track in an iTunes® world.

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 35 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 guest instructor for Midwest University, a regional professional development conference featuring Autodesk software. Jisell can be reached for questions and comments at jisell.howe@uponor.com.

Revit Architecture

by: Andrew Neal David Fastman

The Tool as an Extension of the Hand: Part II in the Autodidact series

Teleoperation is the act of controlling an object that exists in a space, real or virtual, physically disconnected from the user. During such situations, it is not uncommon to observe those controlling the remote object exhibiting movement consistent with the behavior of the remote object. Though this behavior has no obvious impact on one's control of the remote object, it appears tied to one's intentions, thus, possibly representing an embodied representation of ongoing cognitive processes…The implications of these results not only suggest that spontaneous behavior observed during teleoperation reflects a form of visible embodiment, sensitive to task demand, but also further emphasizes the utility of natural behavior approaches for furthering our understanding of the relationship between the body and cognitive processes. (Chisolm, 609)

Peripersonal space refers to the space closely surrounding the parts of our bodies. In the case of the hand, this most closely is approximated by the natural reach envelope. Studies have proven that in both humans and non-human primates alike, neurological responses to objects within the peripersonal space of the hand differ from those further out of reach. (Farne, 408) Researchers have delved into this phenomenon, observing monkeys with and without tools. In the simplest distillation, the subject understands the limitations of its reach (peripersonal space) when confronted with a food pellet out of its reach. With limited training, the subject was able to acquire the use of a rake when presented with the tool, effectively extending its reach and attaining the food. Analysis indicates that when the monkey wields the rake, its spatial awareness is extended by the length of the tool. In short, its peripersonal space becomes that of the monkey plus the tool. (Maravita, 80)

Distal-type neurons
(a) (b) sRF — Before tool-use (c) After tool-use (d) Passive holding

Proximal-type neurons
(e) (f) sRF — Before tool-use (g) After tool-use

TRENDS in Cognitive Sciences
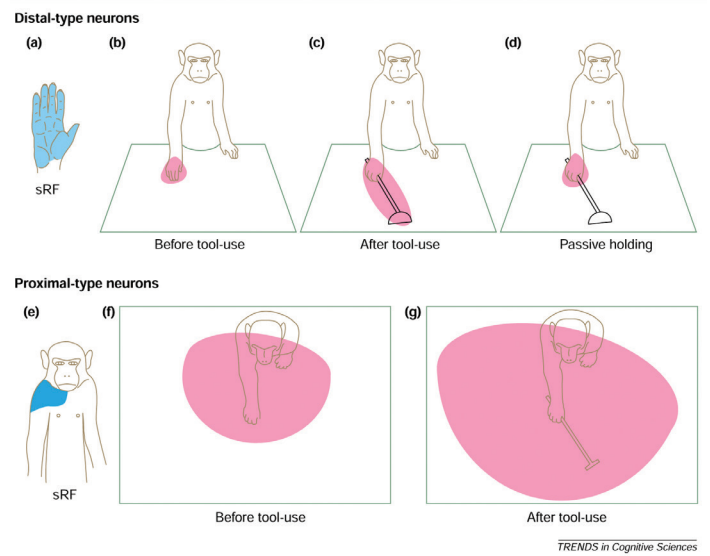
Notably, the research into the use of simple-reach-extending tools enlarges the visual reference fields in the monkey's brain along the rake axis, remapping distant objects as visually nearer. This remapping, which explains the change in spatial awareness, only occurs during the active use of the tool. In fact, passive handling of the tool actually shrinks the reference field back to the pre-tool use size. Cross-modal extinction, the loss of expanded RF with off-handed tool use, presented as greater AFTER tool use rather than before. (Farne, 409) Even more remarkably, while training to use the rake to gather out of reach food pellets occupied a duration of weeks, once the basic skill was learned, monkeys were able to execute a second-order task, using a shorter rake to grasp a longer rake and retrieve pellets placed out of reach of the shorter tool, but within the grasp of the longer one. (Maravita, 84)

The lengthening of peripersonal spatial presence offers a glimpse into first-order mediated action. Much like a tennis player striking a ball, this type of action involves a direct contact with the item, a direct control of a proximal artifact with the body. The second-order action might perhaps demonstrate a more significant perceptive change. Distal objects, in this case, are acted upon by means of direct manipulation of a proximal one—a crane operator utilizing a lever, lifting materials by means of a cable and boom, never directly touched. "Here we suggest that these two mediated actions have different effects on our experience: a successfully learned first-order mediated action produces incorporation—the proximal tool extends the peripersonal space of the subject (the subject is present in the tool)—while a successfully learned second-order mediated action produces also incarnation—a second peripersonal space centered on the distal tool." Further work with similar monkeys demonstrates that through the use of a Microsoft Kinect and monitor, monkeys were able to use a self-image as the distal reference and coordinate their movements to retrieve the food. Identical neural processes applied to the coded image of the hand in the distal retrieval as in the proximal. The image of the hand is experienced as a direct extension of the self." (Riva, 206-7)
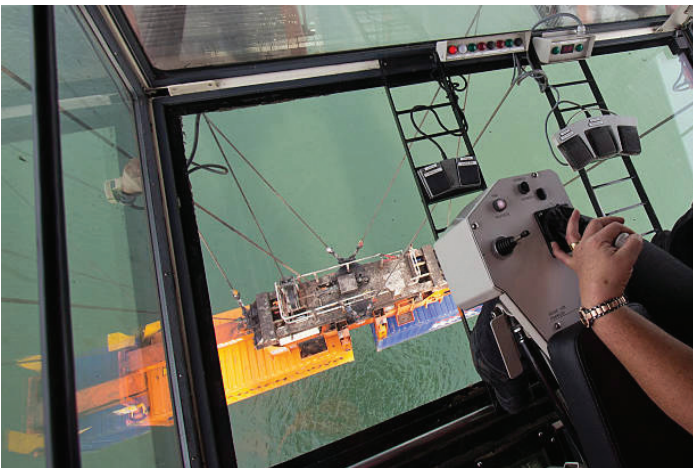

The obvious research into second-order actions lies in the teleoperation of objects in virtual space. The concept remains the same here with the subject using proximal tactile interaction to control realize distal goals. In the first-order interaction, extensions of

peripersonal space manifest as incorporation. In the second-order interaction, this incorporation works in conjunction with remote actions, adding an extension of extra-personal space, thus leading to incarnation. Such incorporation leads to body-based actions related to the remote goal, but not primarily acting on either the proximal or distal artifacts. Behavior such as this belies the concept that the same cerebral functions are being employed. (Chisolm, 602)

To test such theories, Chisolm, et al employed a popular off-road video game in a controlled experiment. Subjects were given either a "regular" or a "reversed" controller, wherein the on-screen vehicle responded to right directional input by moving to the right in the regular scenario or the vehicle responded to right directional input by moving to the left in the reversed scenario. Subjects received ample practice runs to acclimate to the randomly assigned control pattern. Then a set number of time trial runs were filmed.

Computer analysis of the footage revealed that there existed little statistical variation between the ability to operate the vehicle with either control scheme. Further, the researchers observed a clear relationship between the subject's body movements and the intended goal on-screen: When the track turned to the right necessitating the vehicle to turn right, the participants invariable leaned to the right. Surprisingly, the control scheme had no statistical effect on the synchronicity of the body movements and the target movement. Even with the reversed controls, while steering left, the subject leaned to the right as the track veered to the right, indicating a remote goal-driven movement. "This finding provides support for the notion that both action plans are generated separately… and is consistent with the idea that the movement reflects an overt manifestation of second-order mediated action representations rather than first-order mediated action representations, respectively. (Chisolm, 615)
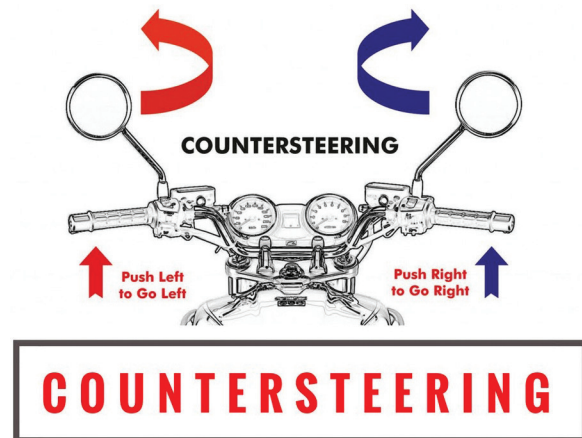
One cannot deny the implications of the inquiries into tool use, spatial awareness, and telepresence in the realms of Virtual Reality and Augmented Reality. But, we live in Real Reality. First and foremost, BIM is a construct, an idea, a paradigmatic approach to delivery in the AEC industry. Autodesk® Revit® is a tool to perform BIM and execute an idea from concept to built form. Furthering the conceit that Revit is the tool, how can it be used as an extension of the hand in the context of an architectural practice?

Revit Architecture

Quoting the vernacular, "guns don't kill people, people kill people," Revit does not design anything, people using Revit do. Coming from the context of approaching the acquisition of a software from an autodidact standpoint (see my previous article, February 2017), aspects of these explorations into presence and spatial perception inform the dialogue. Presence is defined as the outcome of an embodied intuitive simulation of the intended action developed through practice (implicit learning). (Riva, 203)

Learning the software itself becomes the first order action. Of course, we all incorporate the software into our peripersonal space. By learning the machinations of the buttons, menus, elements therein, we associate with the abilities that they afford us to create a virtual (model) representation of our creations, annotations, schedules, dimensions, families, and sub-elements. If Revit is a tool, similar to the Short and Long Rake exercise, the direct user must utilize (and master) the individual tools built into the program to better employ the entirety as a tool. The first-order learning model is simple and straightforward. However, managing a team, acquiring a new software, and maintaining momentum in a complex project with many moving parts transcends first order learning and necessitates a more global approach.

I will posit here that telepresence can exist in a physical space as much as it can in virtual and augmented space. I will further ex-postulate that an architectural team essentially embodies a second-order activity wherein the team leader controls the actions of the team members, thus affecting the outcome of a distal objective. The junior team members become the interface between the controlling element and the objective. It puts the onus of understanding the team's abilities, strengths, and weaknesses on the leadership.

Although intuitive, in the construct of a second order relationship, the junior's ability to use the tool represents the length of the tool in the monkey studies. The perception of presence in that case becomes akin to the understanding of the length of the tool. The perception, in our practice, is that of every member at a differing level. To the junior, ability to use the software is the metric; for the leadership, the best use of each team member is the crucial understanding. In the deployment of each tool within the construct,

greatness can result. The incorporation of the various talents together leads to incarnation of a stellar team.

Sources Cited:

Alessandro Farnè Dr , Silvia Bonifazi & Elisabetta Làdavas (2005) The Role

Played by Tool-Use and Tool-Length on the Plastic Elongation of Peri-Hand Space: A Single Case

Study, Cognitive Neuropsychology, 22:3-4, 408-418, DOI: 10.1080/02643290442000112.

Angelo Maravita and Atsushi Iriki (2004) Tools for the body (schema), TRENDS in Cognitive Sciences, Vol. 8, No. 2, 79-86.

Giuseppe Riva and Fabrizia Mantovani (2012) From the Body to the Tools and Back: A General Framework for Presence in Mediated Interactions, Interacting with Computers, 24, 203-210.

Joseph D. Chisholm, Evan F. Risko & Alan Kingstone (2014) From Gestures to

Gaming: Visible Embodiment of Remote Actions, The Quarterly Journal of Experimental Psychology, 67:3, 609-624, DOI: 10.1080/17470218.2013.823454.

Andy Fastman, AIA, LEED AP BD+C, has worked in various facets of the architectural world for nearly the last 20 years. Educated at the Georgia Institute of Technology, Ecole d'Architecture Paris, La Vilette (formerly Beaux Arts) and University of California, Los Angeles, he maintains one foot staunchly in the academic realm. Andy has worked for a variety of firms in the Los Angeles area including Gehry Partners, Jerde Partnership, and Ball-Nogues Studio. He recently returned to Cuningham Group Architecture's Big Play Group which focuses on big name entertainment and theme park designs. He also teaches at OTIS college of art and design and is affiliated with the New York City College of Technology's Advanced Design online studio critic project. With only 14 months of Revit experience under his belt, Andy continues to learn (while teaching) and extend his reach on a daily basis.

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.

https://lumion3d.com/

LUMION PLUG-IN

See model changes in real-time in Lumion® with a LiveSync® preview version of the model, and also export your projects to Lumion.

Includes a brand new LiveSync connection to Lumion 7.3 (and newer). LiveSync makes it possible to view your Autodesk® Revit® design and material changes in Lumion in real-time with a LiveSync preview version of the model.

Features:

+ Support for Autodesk Revit 2015 to 2018.
+ Support for linked files for Autodesk Revit 2015 to 2018.

LiveSync Preview Features:

+ Stream your Revit model directly and in real-time to view it in Lumion.
+ Make changes to the model or materials, and see those changes immediately in the LiveSync preview version of the model.
+ Pause or stop the preview.

AUGIWorld brings you recent developments in Autodesk and related software items

Export Features:

+ Export models, materials, and textures via COLLADA format (.DAE).
+ Collect all textures in a dedicated folder.
+ Custom smoothness tessellation of surfaces.

https://apps.autodesk.com/ACD/en/Detail/Index?id=4200056251052045027&appLang=en&os=Win32_64

CADTEMPO

CadTempo will accurately track the time spent working in your AutoCAD® drawings. Not only is the total time of the open drawing recorded, but the actual edit time is also recorded.

CadTempo will also record time in AutoCAD LT and other Autodesk products—even viewers such as DWG TrueView. Each user who accesses the drawing is recorded and a complete time history is maintained.

Once drawing time is recorded, the included viewer application displays all data, allowing for printing reports or saving reports to Excel spreadsheets and other formats.

This is a fully functioning 30-day trial; no nag screen to bother you.

https://apps.autodesk.com/FUSION/en/Detail/Index?id=8699194120463301363&appLang=en&os=Win64
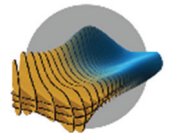
SLICER

Slicer for Autodesk® Fusion 360™ is a tool to turn your digital 3D models into appealing artifacts. It slices and converts 3D models into 2D patterns that you can cut out of any flat material. Slicer for Fusion 360 also creates 3D instructions you can interact with, to help build a model.

Create a model in Fusion 360 and with a few clicks you can send your model to Slicer for Fusion 360. Apply various slicing techniques to your model and create 2d plans in EPS, DXF or PDF formats that you can cut using Laser cutter or CNC machine.

Slicer for Fusion 360 can be used standalone or as an add-in for Fusion, and it lets you use different construction techniques to build your model based on 2D slices and animated assembly instructions.

If you download with Firefox, make sure you remove the .zip extension that Firefox adds when downloading an .exe. Then just Open the .exe and the install will begin.

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
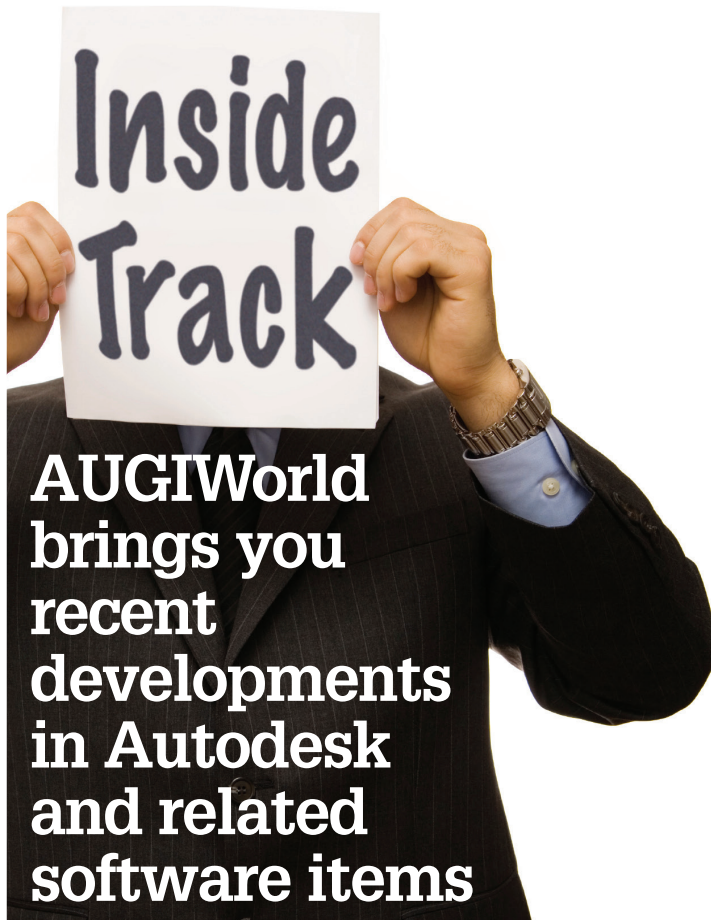
THE ULTIMATE WORKSTATION

Featuring the new 10-core Intel® Core™ i7 processor with one core overclocked at 4.3GHz and the other nine at 4.1GHz, APEXX 4 7404 also has enough room for **up to four full-size, professional GPUs**.

IDEAL FOR APPLICATIONS LIKE

DaVinci Resolve   3DS MAX   MAYA   FLAME

BOXX