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# AUGIWorld

The Official Publication of the AUGI Design Community  
November 2020

# Education and Training

## *Also in this issue:*

- Mind Mapping for Beginners
- CAD BIM CAM Educational Offerings
- Training and Education... A Different Approach



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\*Based on Dell analysis using publicly available data, January 2020. The smallest refers to total surface area of the mobile workstations.



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**CORRECTION:** The AUGIWorld editorial staff regrets that Heidi Boutwell was not properly credited with writing the "Civil 3D 2021 Customization Options" article in the October 2020 issue. We are grateful for her contribution. Please read Heidi's bio below.



Heidi Boutwell is the owner and lead Civil Designer of Strong ARM Consulting, an Civil Engineering support firm. In her many years as a Civil Designer she has developed on-demand eLearning training platforms, CAD Standards for a variety of companies and continues to this day to work on a variety of Civil Engineering projects throughout the USA. Part of her eLearning content that she has created over the years includes training materials for AutoCAD Civil 3D, Vehicle Tracking, AutoCAD Map 3D, Infracworks and BIM 360. Since 1998, Heidi has made a career of teaching engineering professionals how to use infrastructure design tools and software to increase their productivity and improve their design modeling skills. Heidi also continues to utilize Autodesk

tools on a daily basis. She is a contributing author to AUGI and is an Autodesk AutoCAD Civil 3D Certified Professional. Heidi currently serves on the Autodesk Infrastructure Futures council, the AutoCAD Customer Council and the AutoCAD for Mac Customer Council. She's an active participant with the Autodesk Beta team which helps to drive and test the strategic direction of product development for infrastructure products for Autodesk. She is also a repeat speaker at Midwest University.

# Letter from the President



## GREETINGS!

**W**elcome to November! The big news here in the U.S. in the next few days will be the Presidential election. Do not worry, though, I am not touching politics with a “thirty-nine-and-a-half-foot pole!” (Dr. Seuss’ *The Grinch* fans will get the reference) November is also a time of Thanksgiving here, and despite the crazy year that has been 2020, there is still a lot to be thankful for. I am thankful for all our AUGI volunteers who give of their own time to keep our organization rolling. With the many changes over the past year or so, I am exceptionally grateful for everyone’s dedication to AUGI and the drive to press on!

Speaking of changes, one major difference this year will be Autodesk University which will be entirely virtual. There are no fees for attending AU virtually, so if you have never had the chance to attend in person you can check out what you have been missing. There will be live sessions as well as pre-recorded sessions. AUGI will have a bit of a different presence at AU this year. We will be a Gold sponsor and will have a “virtual booth” where you can connect with us here at AUGI. Several of our members and board members will be presenting class sessions – be sure to look them up! AU runs from November 17-20, 2020.

Because of the timing of AU, and because AUGI has expanded our inclusion of software beyond Autodesk, we have decided to host our Annual General Meeting separately from AU during the second week of December. As of this writing, we are still shoring up the details, so watch your email for the specific date and time. We have a very special guest emcee, and I am so thrilled to be sharing a virtual stage with this person! It is a surprise!!

And another change – we encountered a board vacancy with the resignation of Matt Wunch last month. To replace Matt, the board has appointed returning member, Scott Wilcox. Scott is a wealth of AUGI knowledge that we just could not keep away! We are thrilled that he has decided to rejoin the board of directors. Thank you, Scott, and best wishes to Matt on your new adventure!

I am also very thankful to our *AUGIWorld* authors who are very dedicated to bringing fresh content month after month. This month’s issue focuses on Education and Training, and as one who presents training and webinars, I can tell you that training (good training) is so very important. Employers should see value in having well-trained staff – it not only helps boost employee confidence but can help improve bottom-lines as well! I hope you enjoy this month’s issue of AW and be thankful!

Cheers!

Kimberly

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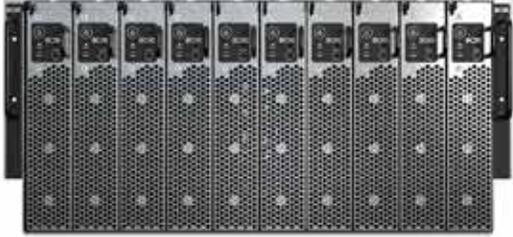
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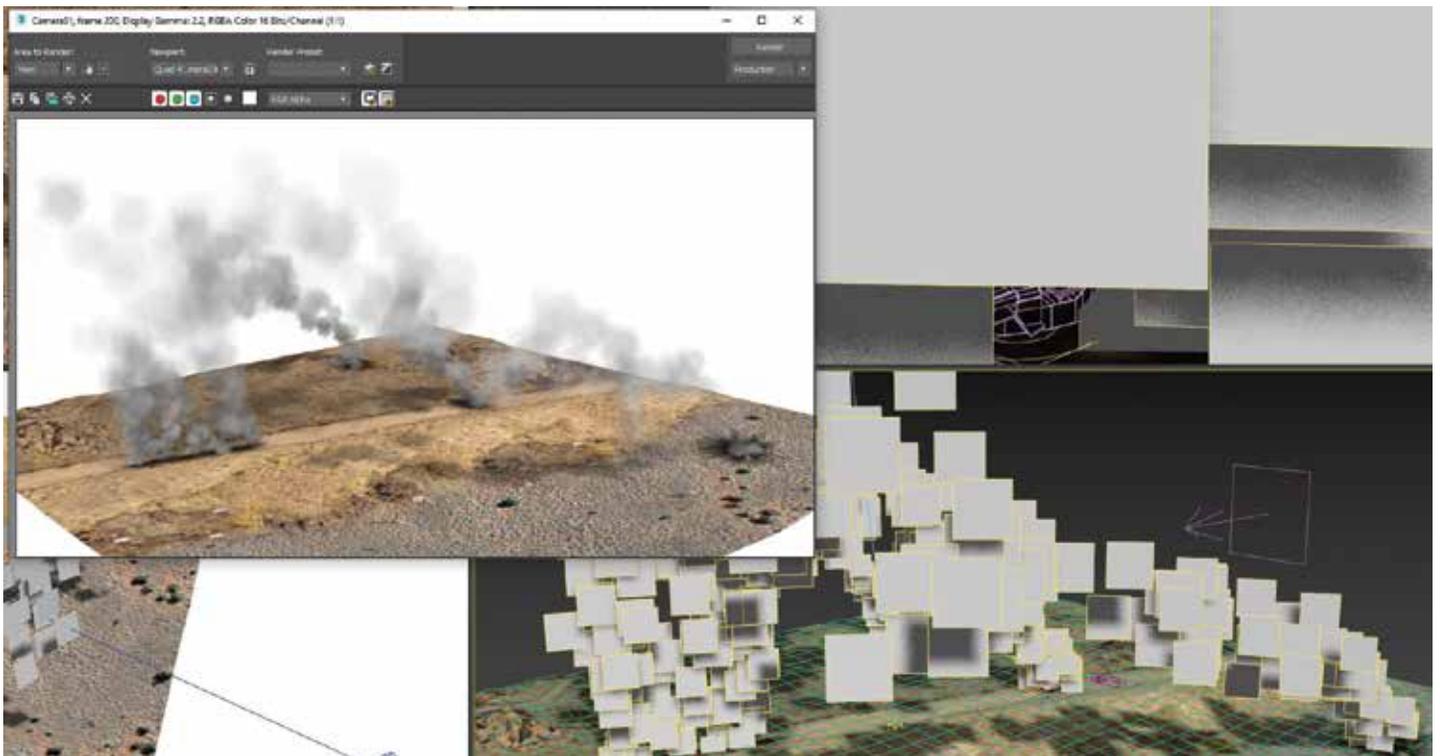
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# Paths to Success

**3**ds Max users can benefit from continued growth in the creative sector. According to the NPD Group, games experienced a 42.5% year-over-year growth in sales rate by month (averaging between March through August this year), while game-related hardware experienced an average 50% increase

and accessories grew an average of 33%. Analysts predict strong growth in the sector for years to come while other technology areas continue to adopt 3D for rendering, visualization, and/or marketing purposes. There are a few ways 3ds Max can learn to take advantage of these opportunities.



First, data still supports the value of college. The Federal Reserve reported someone with a bachelor's degree on average earns one million more than a high school student during their working lives. According to a 2016 report by the College Board, graduates of four-year degrees right out of college earn the equivalent of a high school graduate at 34. Additionally, in creative industries that involve software like 3ds Max, students learn far more than just software and engage with fellow students and artists that lead to future opportunities.

Second, the internet remains an excellent resource for learning. However, learning without direction is like handing a mouse a picture of a mousetrap and asking it to capture the cheese. Here we will present areas 3ds Max is used and ways to learn to take advantage of these future opportunities without ending in a lot of pain and suffering.

## VISUAL FX FOR CINEMA, STAGE, AND TV

FuseFX used 3ds Max to generate content for shows like Agents of the Shield, where they stated 80% of the screen includes CG elements. 3ds Max remains a significant part of their production.

Computer-generated FX involves constructing assets and simulations while understanding the 3-dimensional space better than most. FX artists develop a strong understanding of parallax views and simulate content in a 360-degree environment. Obtaining good results can be a complicated process involving a team of people from diverse backgrounds (animation and compositing, for example).

However, we can get started with simulation and FX in 3ds Max relatively quickly, beginning with the 3ds Max tutorial content. The content dives into simulations like fire, smoke, and liquid. If users wish to dive deeper into FX with 3ds Max, RedefineFX generated 70+ tutorials here: <https://redefinefx.com/free-vfx-tutorial/>. Understanding how content is composited in a film, stage, or TV environment is key to understanding how to create FX with 3ds Max. So, it's my recommendation that users who want to learn more about FX with 3ds Max also learn to composite.

## CONTENT FOR GAME DEVELOPMENT

Ubisoft used 3ds Max to help develop the Assassin's Creed® franchise, selling roughly 155+ million units with 100+ million unique players. From 2019 to 2020, Ubisoft continues to acquire companies and grow. These acquisitions include i3d.Net and Kolibri Games. Additionally, they started a studio in Da Nang, Vietnam, dedicated to mobile and social media platforms.

3ds Max helps build assets for games like Assassin's Creed®, including landscapes, props, characters, animations, and much more. While it is essential to understand how to create this content using 3ds Max, it's just as important to know how they are used in game engines to target learning efforts toward productive tasks.

Unity and Unreal Engine continue to dominate a large portion of the game development market. Both companies are incredibly altruistic and entrepreneurial, supporting developers through their creative and technical challenges. Through this effort, they provide an enormous amount of learning material. Unity started <https://learn.unity.com/> designed to teach users from introductory to advanced, while Epic Games created <https://www.unrealengine.com/en-US/onlinelearning> for the same. Having supported creators for decades, both companies understand the challenges of learning their software, working with software like 3ds Max, and have set up material so users can learn development from the beginning to the end.

## VISUALIZATION

3ds Max is popular with the visualization industry due to its compatibility with CAD software like Revit, while allowing users to take advantage of V-Ray, an external plugin developed by Chaos Group that produces excellent and realistic renders.

Binyan Studios, who uses 3ds Max and V-Ray, grew to be one of the more successful visualization firms in the last decade, having reached revenue in the tens of millions at one point. 3ds Max plays an essential role in their production and many other firms around the world. Additionally, officials' demand in public and private sectors for 3D representations of projects grows worldwide.

To address this demand, 3ds Max users need to learn efficient methods for producing visual content. For production, repeatable results are king. Ciro Sannino developed a comprehensive, detailed, and repeatable system to generate extraordinarily professional and realistic visualization content using 3ds Max with the V-Ray plugin. His experience and all-inclusive understanding of architecture and architectural photography helped him to develop the 5SRW Certificate [https://as2.ftcdn.net/jpg/02/09/84/51/500\\_F\\_209845110\\_baopDGzjrZrjIV0QEh3MiV7aMNjdRggt.jpg](https://as2.ftcdn.net/jpg/02/09/84/51/500_F_209845110_baopDGzjrZrjIV0QEh3MiV7aMNjdRggt.jpg) [https://as2.ftcdn.net/jpg/02/09/84/51/500\\_F\\_209845110\\_baopDGzjrZrjIV0QEh3MiV7aMNjdRggt.jpg](https://as2.ftcdn.net/jpg/02/09/84/51/500_F_209845110_baopDGzjrZrjIV0QEh3MiV7aMNjdRggt.jpg) ation built from 50+ tutorials and testing. Users can sign up for the tutorials and testing at [learn-vray.com](http://learn-vray.com). The steps are clear and concise:

1. Framing
2. Lighting
3. Materials
4. Final Render
5. Post-Production



Brian Chapman is an Autodesk Authorized Developer and CAD Applications Specialist for Westwood Professional Services. Brian can be reached at [procadman@pro-cad.net](mailto:procadman@pro-cad.net). You can review some of his personal work at [emptypawn.com](http://emptypawn.com) and [procad.blog](http://procad.blog)

# CAD/BIM/CAM Educational Offerings



**W**ith the pandemic continuing on, education has become virtual for so many students at every level. Remote learning, hybrid, and in person learning have blended in new and creative ways. CAD, BIM and CAM providers have for years offered student software access in many ways.

Here are few ways Autodesk and others are providing educational tools and training to students all over the planet.

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  - You will be prompted to confirm your school and may be asked to provide additional documentation as proof of

# Tech Manager

enrollment or employment at a qualified educational institution. For more information, check out the FAQ.

- If you already have an Autodesk account, simply sign into your account and complete your education profile. You will then be required to confirm your eligibility.
4. Return to the Autodesk Education Community and access your chosen software.

## OTHER VENDORS: (FROM THEIR WEBSITES)

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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](http://www.caddmanager.com) and [www.bimmanager.com](http://www.bimmanager.com).

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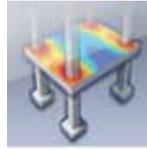
The toolkit includes the following components:

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- + ADA - main shortcut,
- + ADAF - 'Format' window, in this window user can select predefined format date,
- + ADAE - 'Edit' window, used to edit list of dates (move items up, down, delete or 'Add date' window)
- + ADAA - 'Add date', used to add new format date,
- + -ADA - all commands are combined under one.

**Inside Track**

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



## IPRINT

<http://www.dnsistemi.com>

Autodesk Inventor: 2021, 2020, 2019, 2018  
Autodesk Inventor Professional: 2021, 2020, 2019, 2018

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The capabilities of iPrint are not limited to printing but also allows you to define the order in which the drawings will be printed, for example in alphabetical order, list order, etc.

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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](mailto:brian.andresen@augi.com)



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# Training & Education... a Different Approach



**I**n this article we are going to look at how the world changed over a few months from face to face working to working remotely. Companies and employees forced to change how we work, training and educating ourselves.

The year is 2020 and everything has changed as we know it and it continues to change the world. The impact of COVID-19 across the globe has made a big impact on our daily lives and working. Many towns, cities, states, even countries being lockdown, and some put into quarantine. Stopping everyone from travelling to work, seeing friends and family, days out or going on vacation. Which means, many of us are unable to go out to work and having to change how we can work.

As part of my job role, I often travel up and down the country working directly with clients to help support their requirements from training on software such as Autodesk Revit, Navisworks, BIM 360. Not to mention, being a technical advisor helping enhance change, moving to a more digital way of working and helping our industry embed Building Information Modeling (BIM) into everyday working. Then, for this to stop everything from meetings in-person being cancelled, training courses frozen as delegates cannot attend in person, and all conferences cancelled.

Now, everyone is being asked to work from home. Restricted travel across the country and world to help reduce the risk of catching or passing on this awful virus. Leaving businesses and employees having to think how we can all work differently. I cannot speak for everyone across the world right now, but this year has been challenging for everyone.

## ADAPTING TO THE NEW NORM

Due to the pandemic, many of us have switched from working at the office to working from home. I can hear many people jumping for joy not having to travel for hours a day to get into the office and the same back home in the evening. Then, others not really wanting to work from home at all and others unable to work at all due to their job roles leaving them either furloughed or even out of a job completely.

There are also those who have children suddenly finding the schools have closed and now they are at home as well, leaving you to juggle working from home, looking after their child and even home schooling.

All that said, here are some tips which I have picked that should help you if you are working from home:

1. Create a workspace at home. Not just on your kitchen table.
2. Get ready for your workday as you would if you are going to work in the office. This can help keep you in a routine.
3. Make sure you have all the tools you need. Computer, software installed, internet access, phone, notepad, etc.
4. Make yourself a to-do list of the tasks or work to be carried out during the day.
5. Take regular breaks. At lunch time get some fresh air. Maybe go for a walk, run, or exercise.
6. Make sure you keep in touch with colleagues. Zoom calls, phone calls, and/or text messages.
7. Try and avoid the temptation of social media.

A BIG THANK YOU must go out to all those frontline staff in health services, care workers, emergency workers, delivery workers, essential food stores, and takeaway businesses whom have carried on to help ensure those who need care can get it. Thank you.

## DIGITAL WORKING

The current situation has forced many businesses to move to a more digital way of working or move sooner than planned. I.T departments have been much busier than before ensuring the company has the infrastructure in place and all staff members have the hardware needed with the essential software installed. This has also helped software companies allow access to some software for free, extended licenses, and deferring payments for six months. Autodesk themselves ran an Extended Access Program allowing free commercial use of several cloud collaboration products such as BIM 360 Docs and Design available to customers. You can read about it here: <https://adsknews.autodesk.com/views/covid-19>

We have all probably experienced many more conference and video calls, webchats, screen sharing, and webinars from our home office or make do office on the kitchen table.

Those who have embraced the technology shift and digital way of working during lockdown, and those who have been able to continue working like before. Seeing that embracing Building Information Modelling, processes, standards, and technology and seeing those benefits while getting some ROIs put in.

## TRAINING WHAT HAS CHANGED

We have seen many training budgets cut or scrapped altogether, leaving employees to learn whilst working and figuring out how it works out its new tools and processes for themselves. Which as you can imagine, can be worse in the long run. Employees will need to spend the time figuring out how to use or doing something live on fee earning projects, potentially extending the time it takes to do something. There could be project delays, costs incurred and some rework to correct mistakes. I am sure this is certainly not something any company would like to happen.

The other possibility is that work has been put on hold until construction sites open back up, or the client push's a project back due to financial constraints.

So, this is the ideal time to start training.

## VIRTUAL TRAINING

Virtual training is certainly nothing new and many organizations have been delivering it for many years. But it is generally not the preferred option for most.

So firstly, what is virtual training?

It is training undertaken virtually (web-based training), or in a simulated environment. This could be instructors and delegates in separate locations. These environments are to try and simulate the traditional classroom or learning experiences.



Figure 1 – Virtual Training.

This can have several benefits.

**Time efficiency** – Not having to travel to a location, flexible start, and finish times.

**Cost** – Training virtually generally costs less, as staff do not need to travel, nor does the instructor. Plus, any expenses on top of this.

**Recordable and Reusable** – Live training and webinars are possible to record so the content can be used again later. Those who are unable to attend can watch it.

**Sustainable** – By not travelling, everyone is reducing their carbon footprint.

There are some pitfalls as well.

# Customer Success Learning Hub

Learn best practices and key workflows in only 15 minutes a day. [Learn more](#)

Architecture

Civil Engineering

BIM Management

Mechanical Engineering

MEP Engineering

Structural Engineering

Figure 2 – ADSK Customer Success Learning Hub.

**Technical issues** – Virtual learning environments and platforms are subject to technical issues, such as the network going down, the bandwidth speeds, power cuts, and even security issues.

**Computer Literacy** – Having to navigate an e-learning platform, as well as, learning something new can be overwhelming for some.

**Support** – Feeling like you did not get enough individual support during the training when training in large numbers.

It is good to be aware of the types of issues you possibly can experience during virtual training. So, make sure the necessary steps or processes are put in place to help prevent them from happening. And do not be put off.

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## AUTODESK DESIGN ACADEMY

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These courses can vary in length, but these courses cover many different industries and Autodesk software solutions.

To find out more and get started today go to: <https://academy.autodesk.com/>

## RESELLER TRAINING

Let us not forget the lynchpin of the Autodesk channel and that is all those Autodesk resellers and training centers who have been supporting Autodesk users for many years. Traditionally, you would attend their formal training courses at their training centers or at your own office. Many of them have quickly adapted to offer virtual training. You can find a list of local Autodesk training centers at the following website. <https://www.autodesk.com/training-and-certification/authorized-training-centers>

The screenshot shows the Autodesk Design Academy website interface. At the top, there is a navigation bar with links for LEARN, TEACH, PORTFOLIOS, COMMUNITY, INSPIRATION, and ABOUT US, along with a search icon and a SIGN IN button. Below the navigation bar, there is a 'FILTER BY' section with four dropdown menus: 'Areas of Study - all', 'Software - all', 'Levels - all', and 'Careers - all'. Below the filters, there is a 'SORT BY' dropdown menu set to 'Newest'. The main content area displays three course cards:

- Introduction to Structural Analysis**: A card with a blue 'R' icon, a photo of a building under construction, and the text 'ENGINEERING Introduction to Structural Analysis. Structural engineers design and analyze buildings.'
- Multi-Axis CNC Toolpaths**: A card with a blue 'F' icon, a photo of a CNC machine, and the text 'MANUFACTURING ENGINEERING Multi-Axis CNC Toolpaths. Computer Numerical Controlled machines, or CNC for short, can have a nearly endless number of options. Most machines feature control tool motion in 3-axis: X, Y, Z.'
- Creating Toolpaths for a CNC Lathe**: A card with a blue 'F' icon, a photo of a hand operating a CNC control panel, and the text 'MANUFACTURING ENGINEERING Creating Toolpaths for a CNC Lathe. CNC machines come in an almost endless array of...'

Figure 3 – ADSK Design Academy.

I currently work at a Platinum reseller here in the UK where we quickly switched our course from classroom based, to online, using various solutions which has been a great success and has worked very well. The delegates we have trained thus far, have enjoyed it, and so have I. We have been doing this internally for years. This is because we are based all over the country.

The other alternative is to sign-up on one of the online learning tools such as CADLearning, Global eTraining, or LinkedIn Learning. These are some to name a few. They are generally cheaper than attending a training center and can be undertaken at any time or anywhere. They also offer support if you need help, but this generally is not live at the time of training. Speak to your reseller to find out more.

Also, if you haven't noticed many resellers have been offering lots of webinars, lunch & learn sessions, and YouTube live classes over the past six months. Why not check out your local reseller's YouTube channel, website, and blog pages.

## AUTODESK UNIVERSITY

As the current pandemic forces Autodesk to move their Autodesk University conferences online, we don't have the joy of looking forward to travelling to our local one, or the main one in Las Vegas. Getting to meet everyone across the industry, networking, learning interesting things, and generally having an awesome time. We do not need to sit at home and watch social media while everyone tweets they are having a great time. We can all attend the Global AU 2020 online for **FREE**.

I hope all have registered and enjoy the experience AU offers.

<https://www.autodesk.com/autodesk-university/conference/overview>

I have registered and will be there tuning in from home checking out the great classes.

## MODEL PRODUCTION

I would like you to think about this following question a little bit here: "When building a model, do you actually build with the end in mind, or its intended use?" Many of the models I have seen on projects are most definitely not. So, when it comes down to using the model for construction sequencing, often those who are creating the sequencing end up editing the model to allow them to use it. An example could be a floor slab modelled across the entire building instead of split into pours, or it could be a column running from foundation to roof instead of splitting it at floor level. Then there is the final as-built model giving the client/owner/operator a model that matches the actual built building or digital twin.

Generally, there are not any courses out there on this subject. So, speak with your Autodesk reseller or training center to see if they can help. Your company should be learning on every project they undertake. So, make sure you record what you have learned from these projects, what worked, what did not, and what you need to do next time to avoid any mistakes. You can learn a lot from those around you in your teams and on your projects.

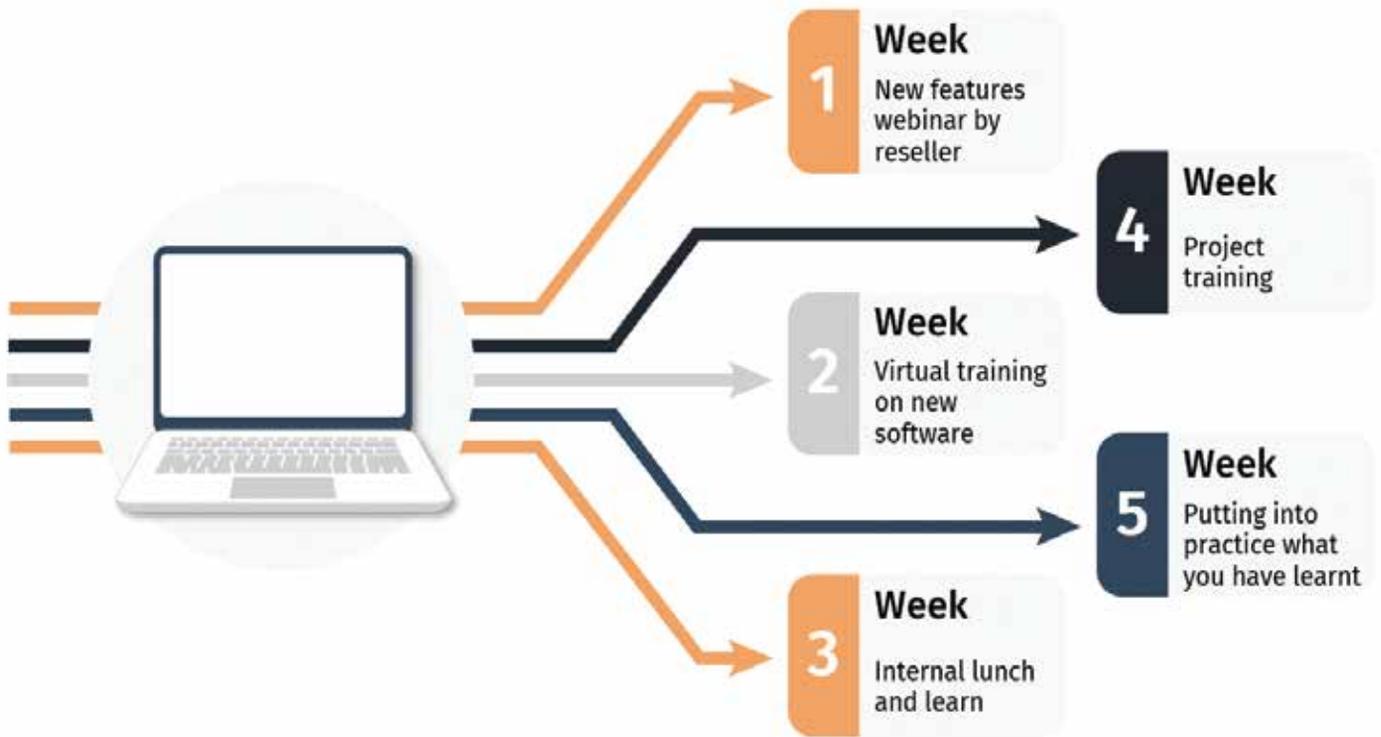


Figure 4

### IFC TRAINING AND EDUCATION

Generally, projects will require you to deliver to in OpenBIM format such as Industry Foundation Class (IFC). So, what is IFC? It is an open, standardized digital description of the built environment, including buildings and civil infrastructure. It is vendor neutral and usable across a wide range of hardware devices and software platforms.

Please refer to the following international standard (ISO 16739-1:2020) for more information.

It does appear there are not many who understand what IFC is, how to generate an IFC schema, and how to use it. So, I would strongly recommend first downloading the Autodesk Revit IFC manual and having a read through, as it gives you a good overview. Then, getting some training on what IFC is to help you understand it further. Finally, get training on exporting and importing. Also, IFC files from Revit user or from a service provider who knows how it works. I have seen too many IFC files delivered where the information is incorrect or missing. That generally comes down to the user not understanding how it works.

Quick tip: Make sure you have the latest IFC add-in for the Revit version your using. Autodesk updates this regularly. So, even if you downloaded it a few months ago, it is likely it has been updated again since. Search the Autodesk App Store for IFC. <https://apps.autodesk.com/en>

### COBIE TRAINING AND EDUCATION

Construction Operations Building Information Exchange (COBie) is a non-proprietary data format focused on delivering asset data for life-cycle capture. COBie helps capture and record important project information such as product data and warranties. You may ask why do you need to know about COBie if your delivering structural elements of a building? Well, believe it or not, I have seen some project requirements ask for COBie as a deliverable. To enhance your skills and company’s capabilities, you could learn COBie and be able to check COBie files on your projects. Meaning, you can offer further services and potentially earn more.



Gareth Spencer is an experienced BIM Consultant at Man and Machine (Autodesk Platinum Reseller) in the UK, with a demonstrated history in the computer software industry. Skilled in Autodesk software such as AutoCAD, Revit, Navisworks, and BIM 360. Also certified professional in Revit Architecture and Structures. Speaker at Autodesk University in Las Vegas and London. Follow Gareth via Twitter @TheDarkAsset, on his blog <https://garethspencer.com> or email [gareth.spencer@live.com](mailto:gareth.spencer@live.com).



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# Sweet Map O' Mind: Mind Mapping for Beginners




**C**hapstick. Comfortable shoes. Buffet food. Suitcases with ample reserved space for free stuff... These are just some of the things that might not necessarily be emphasized as much this year as Autodesk University 2020 is going virtual!

One thing that I know certainly will not be different this year is the plethora of learning resources available to all attendees of the conference. This will be my sixth time attending the conference, and each year feels like attempting to drink from a firehose. I love it, really, I do. But it is so much information to take in all at once!

I have tried taking notes on paper... I have tried typing notes on a laptop... I have tried taking pictures and videos... I have tried saving handouts...

All these things were my attempts at capturing everything being thrown at me at the Autodesk University conferences. For the CAD and BIM management role I have had for years, it is simply not enough to absorb the information; you need to plan training and education action items for ongoing learning. How on earth can you take in so much information, filter it to fit the needs, and ultimately turn insight into action?

Well, I am here to show you how to build and use your own mind map that can help you do exactly that!

## WHAT IS A MIND MAP AND WHAT ARE THE BENEFITS?

To put it simply, a mind map is a non-linear way to visually capture ideas around a central theme or topic. Where long detailed documents accompanied by endless disconnected note scribbles might strike fear, mind maps are a more intuitive and flexible way to display how ideas relate and connect to others in all sorts of areas.

Not only that, according to an article put together by the creators of MindMeister mind mapping software, there are several benefits backed by research. Here are some of them that I have personally experienced:

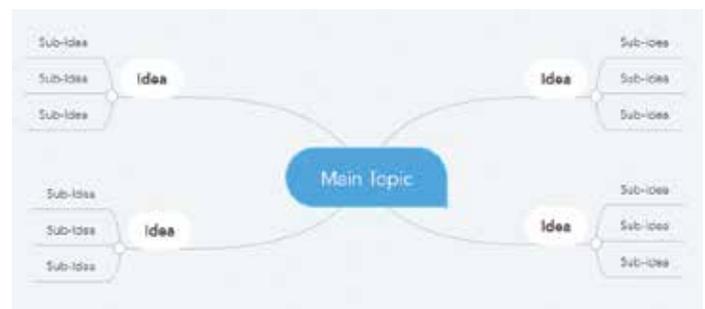
1. Mind mapping helps make complex issues easier to understand because of the connected links and clarity from laying everything out. (Frey, 2017, as cited in Greene, 2020). I have experienced this myself because my CAD/BIM management role for years included a lot of project management and strategic planning for initiatives such as software deployments and new product development. Mind mapping helps me understand issues on a systems level to help me holistically solve problems. I have written about this in the July 2019 issue of AUGIWorld magazine for those interested in learning more.
2. Mind mapping helps with creativity because of the ease of getting ideas “onto paper” and connecting to other ideas as quickly as possible (Dykeman, 2019, as cited in Green, 2020). As I am sure many can relate, my mind can often go in many different directions. Sometimes it can be incredibly overwhelming. By getting everything into something like a mind map, effectively called a “brain dump,” I do not have to feel like I somehow must remember everything at once. This allows for clarity and bringing in more ideas to connect to the existing ones. It should be no surprise then that people might use mind maps for creatively planning projects and fostering means for innovation.
3. Mind mapping helps with memorization and retention due to its visual nature. The idea of needing to recall information quickly is not a brand-new concept. The Greeks and Romans used visualization techniques to do exactly that (Zielinski,

2014, as cited in Greene, 2020). Mind mapping is similar in its technique because the diagrams can be stored much more easily compared to other representational formats (Davies, 2011, as cited in Greene, 2020). I have used mind maps for gathering information from trainings, documenting stores of knowledge, and more. I feel that I can personally recall the information a lot better due to remembering where it is on a map as opposed to having it in a large typed up linear document or countless notes that sometimes just end up getting forgotten about.

4. Mind mapping in a software improves your productivity due to the ease and flexibility of adding and moving around information. It is incredibly easy to drag and drop, hit Tab to start new nodes, etc. This ease of use allows for great productivity not only from using a dedicated software but also in seeing clarity in your thinking as you go. According to Chuck Frey’s mind mapping survey, “experts of mind mapping software say it saves them an average of 7 hours per week – the equivalent of almost a full day of work.” (Frey, 2017). In my previous role, I saw productivity increases from copying nodes for a repeatable framework, such as what I used to deploy software updates.
5. Mind mapping enables “meaningful learning” where new knowledge can be linked to existing knowledge. The actual activity of mapping the different thoughts “forces” the learner to find connections between otherwise separate thoughts that may have been known beforehand (Hay, Kinchin, & Lygo-Baker, 2008, as cited in Greene, 2020). At a conference such as Autodesk University, there are many opportunities to learn about any topic of your choice, so a mind map could certainly help to connect insights from different classes and conversations to try out a new workflow that might work well for your needs. In my case, I used mind maps in an effort to help move an office onto the use of Revit.

All of that said, mind maps could be your ticket to achieving more “aha!” moments and not feeling like you somehow must keep all the information in your head. At an event like Autodesk University, this could be a fantastic tool for building your own professional development and training plan. Best of all, mind mapping can be done with free tools and is easy to learn. Sound good? Read on!

Figure 1 shows the basic layout of a mind map.



Main Topic with Ideas and Sub-Ideas

The main idea is that you start with a central topic in the center and then get more and more detailed as things “radiate” or branch away from the center. There really are no “rules” with this, but there are general guidelines I have seen for having success in using mind maps.

## MIND MAPPING GUIDELINES

1. **Try to keep thoughts short and to the point.** One of the main reasons that mind maps can reduce the feeling of being overwhelmed and feel more engaging is that they can be super easy to scan. It is possible to do this if you try to keep things short in any idea and sub-idea. If there is a long definition of something, I might be more inclined to put this within hover text, not within a node itself. In addition to this, supplemental information such as links, attachments, and pictures can help create a wonderful resource for professional development and training if you or others would like to explore the map further.
2. **Experiment with Layouts to Best Display your Map.** Sometimes I have a ton of sub-ideas in a mind map. In a “radiating” mind map layout, this could look very “heavy” and a little hard to navigate. I find the most success in a radiating layout by having relatively, evenly distributed content in the form of ideas, sub-ideas, and sub-sub-ideas. That’s basically the mind map equivalent of sticking to six bullet points per PowerPoint slide to keep things easy on the eyes.

Thankfully, there are different mind map layouts that can assist with this if you have a ton of information that you can’t help but display in such a way. I find that the “organizational chart” layout seems to work better for topics with tons of “sub-ideas.” A good example for this layout might be in listing a bunch of supplemental resources or classes from conferences that cover the same topic, as shown in *Figure 2*.



Organizational Layout

3. **Build Interactivity for Ongoing Use.** A common theme I see with endeavors like this is that these wonderful things get

built, but then they are a bit difficult to maintain or get actual action items out of them.

A way to combat this challenge is to build accountability and tasks into the map. This allows you to assign training topics or activities to people on your team. Progress, due dates, priorities, and automated email notifications can be set within the mind mapping software itself.

Here is an example of an onboarding virtual training plan that could be built using a mind map. The ideas can be placed on the map, and the action items can be assigned to specific people on your team. Note, that an actual training plan would be a lot more detailed and tailored to your specific needs.



Example Training Plan with Action Items

## CONCLUDING THOUGHTS

So, are you ready to create your own mind maps? Great. There are multiple ways to go about it. All the examples here are shown using MindMeister mind mapping software, which is free but offers some paid plans for additional features. Other options include Miro (*Figure 4*), XMind (*Figure 5*), as well as even the SmartArt options within Microsoft Word.



Example mind map shown in XMind mind mapping software



Example mind map shown in Miro mind mapping software

The same concepts apply no matter which route you go to suit your needs. My focus here is simply on how to get you up and running as soon as possible.\*

There are all sorts of uses for mind maps, and I hope you will find it to be a fun tool that will help you capture information for your own professional development as well as form training plans for those at your firm. What I would recommend is practicing with creating some of your own mind maps prior to Autodesk University, so you can be prepared to capture notes in a new and exciting way. Happy mapping!

## SOURCES, ADDITIONAL READING, & NOTES

\*All images or references to specific software apps are simply for educational use and explanation of concepts.

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Jisell Howe, CDT has been in the construction and MEP industry for over ten years. With a background in CAD/BIM management in a hybrid design and manufacturing environment, Howe has presented work in multiple avenues such as AUGIWorld magazine, Midwest University, Autodesk University, various BIM and CAD podcasts, and other avenues in the data science community. She holds a Bachelor of Science degree in Applied Management as well as an Associate of Applied Science degree in Architectural Drafting & Estimating from Dunwoody College of Technology. Howe is the Senior BPM Platform Integration Manager for ENGworks Global, a highly regarded and internationally recognized VDC service and solutions provider ([www.ENGworksGlobal.com](http://www.ENGworksGlobal.com)). She can be reached for comments and questions at [Jisell.Howe@ENGworksglobal.com](mailto:Jisell.Howe@ENGworksglobal.com).

# Groin Vaults a Model of Efficiency

 From the desk of “you wouldn’t believe what I saw modeled” I was inspired to take a look back from a pandemic’s perch. Stay well, model safely ;)

Think before you model!

Is there a better way?

What is not being considered?

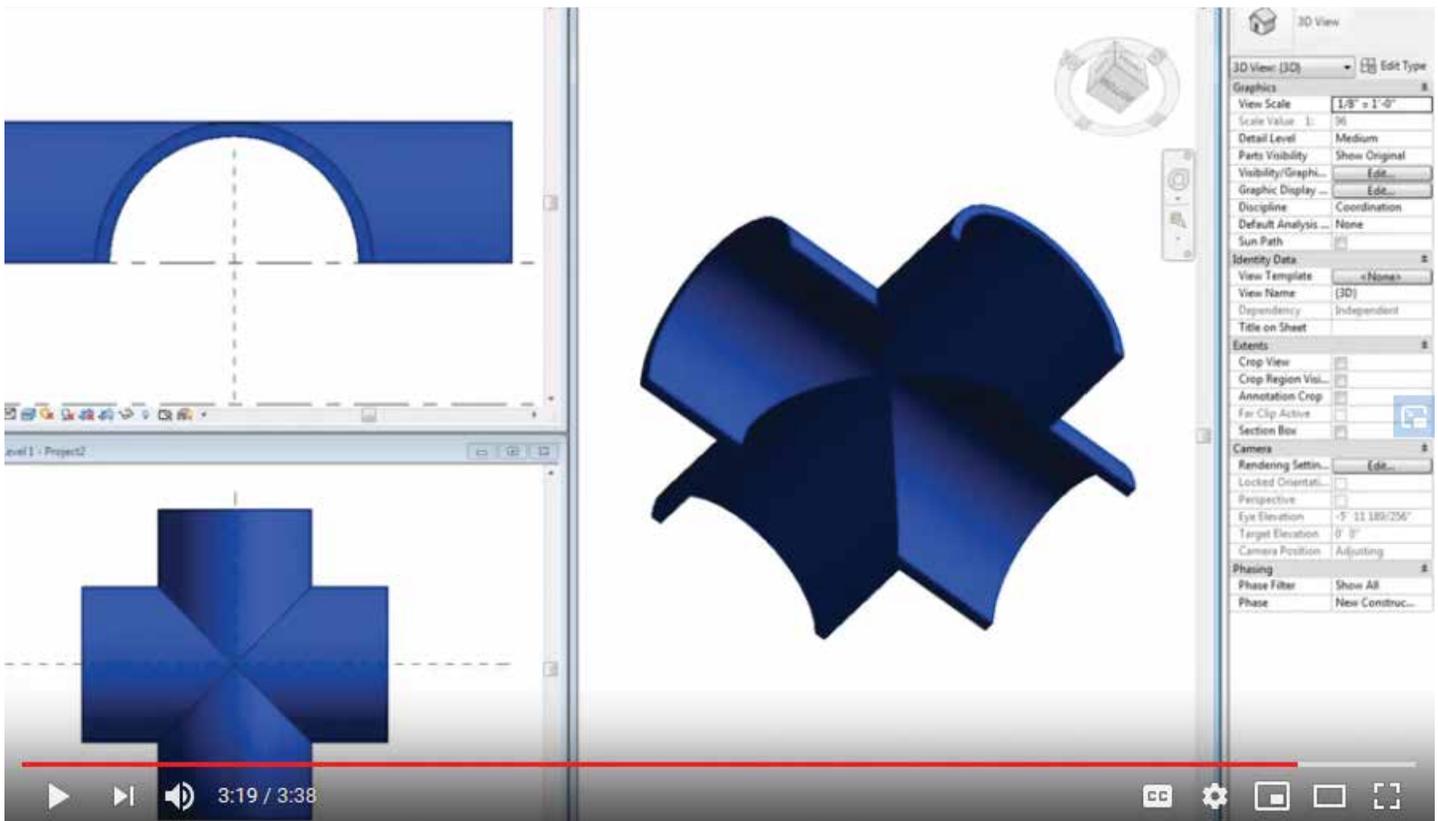
How would Jay do it?

I dare say “Watch the video below” So I shall...

Watch the video below; if you want a quick way to model Groin Vaults that is...

Why do I dare? Well, so I don’t have to elaborate (at this time) on my thinking that much of humanities’ outlook; that things (Revit Modeling, in this case) are difficult or not as easy as “other” software, etc., is usually an ego response to a lack of understanding, clarity, or perspective. Also we must resist our great capacity to make complex that which is simple (and/or easy).

I posit that many, if not most times, it is us marginally evolved primates who add the complexity in too many cases; it is us who fail to think things through before bounding forth (kinda why Architects and Engineers are Planners, no???)... Software only does what



we tell it and until we know the entire breadth (or most) of the possibilities available in a software we are not yet qualified to render an intelligent viewpoint. Revit can accomplish everything required for BIM creation... there are only a few good ways though to do any one task.

But hey, we enjoy freedom of speech. So, I guess one can bring any viewpoint (erroneous or not), just be ready for the fallout ;-)

I am not saying that I don't jump into things with both guns blazing as it were, but if I am trying to create something in an AEC modeling software, I might try what "I think" should be done first; but I do keep an open mind that "it may very well be my lack of understanding" that makes me think "it can't be done", etc...since usually (read as: most all the time) it can be. That said:

3 minutes of groin vault bliss at: <https://youtu.be/VHjGsFAX-q3E> (funny voice at no extra charge)

Actual Modeling time of Groin Vaults: 1 minute 50 seconds

If I would not have been explaining at the same time, it would have taken about 1 minute or less. But, this is less about me and more about what you can do too!

If you know anyone who complains about Revit, saying things like "in other software it only takes a few button clicks to draw a line", set them straight that it's a 'them' problem...a perspective challenge.

I usually look to the whole project and overlay the idea that sometimes it is 'faster' spending more time to do a task once correctly than it is to rush through just to appear 'complete' (and having to do it again). That said, sometimes faster is the best approach. Like in the groin vault's case, your results may vary.



*Learn. Always. Push. Change. Inspire.*

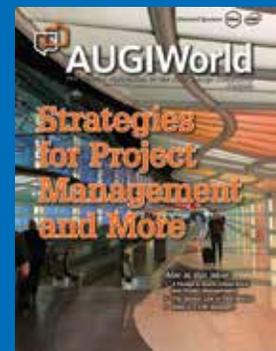
*Art - Architecture - Technology - Creativity*

*With over 20 years of Architectural experience Jay B. Zallan enjoys a varied and diverse portfolio spanning high-end custom residential design, large mixed-use developments, major transportation and infrastructure projects through most every large-scale project type. President of LARUG (Los Angeles Revit Users Group) and an Autodesk Implementation Certified Expert (ICE), Jay combines unique insights into the creative and business process of AECO with proven management, creativity, and project generating strategies. Enabling, empowering, and inspiring teams to realize their own dreams and potentials beyond limitations (whether real or perceived).*

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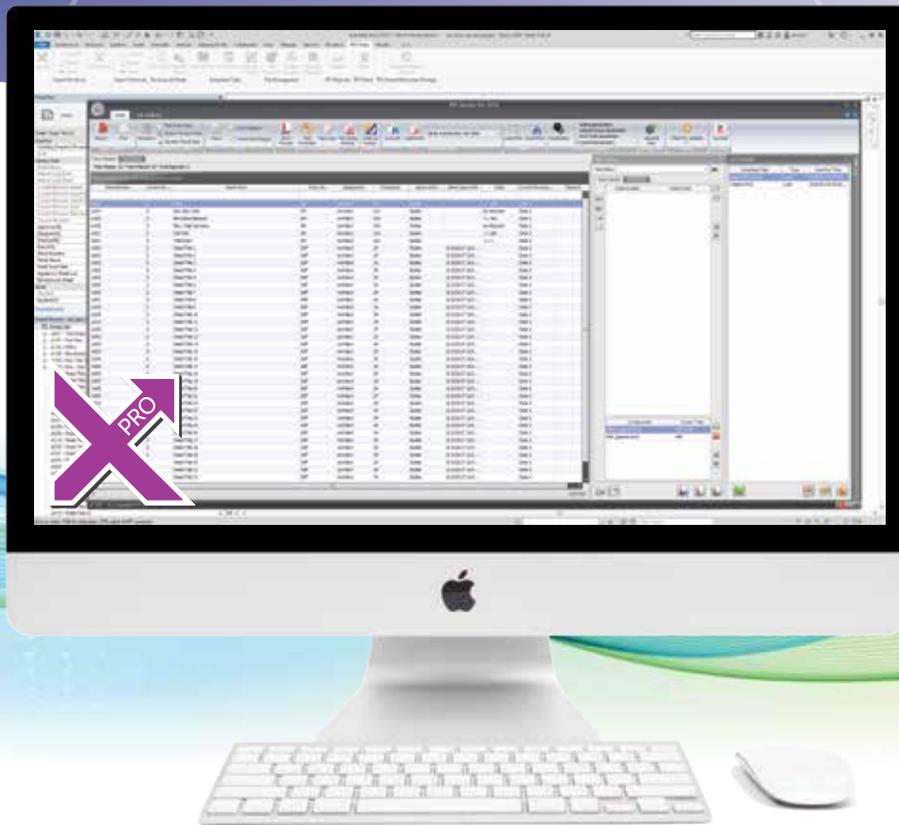
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