

# VirtualWork

A newsletter for customers and friends of IES

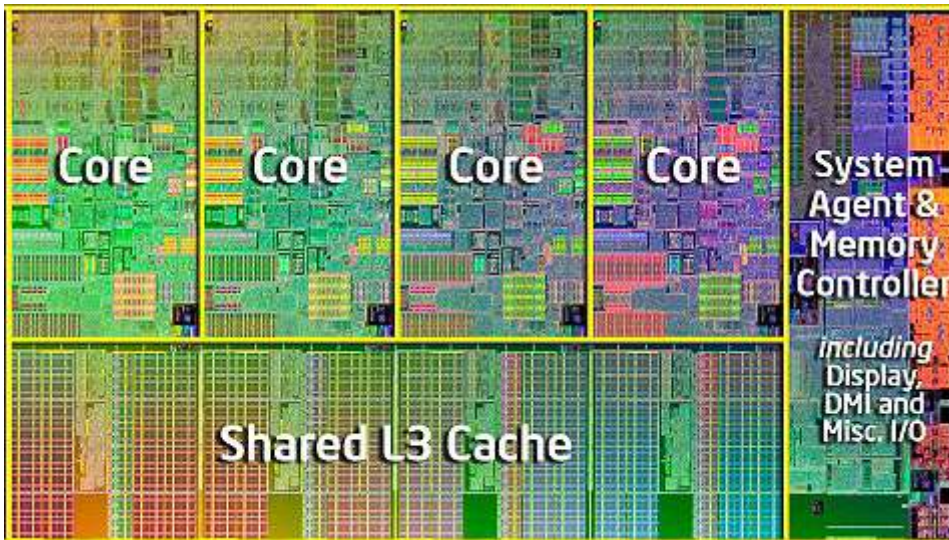
## 64-Bit Applications

### Transitioning to 64-bit Only

With the release of VisualFoundation 7.0 last month, IES is inaugurating the transition to 64-bit only applications. Intel and AMD CPUs have been 64-bit in most machines since about 2003. Microsoft started really pushing the 64-bit version of Windows 7 around 2009, and it has been the most common machine configuration since then. Microsoft decided it could better juggle applications more efficiently on the 64-bit platform.

### Why 64-bits?

With engineering applications, the 64-bit platform offers **primarily a memory boost** rather than an accuracy or performance improvement. (Most engineering algorithms run using 'doubles' for floating-point arithmetic, and this does not change between 32-bit and 64-bit platforms.) This means that with a 64-bit application you could potentially solve larger projects before running out of RAM memory. With a 32-bit version of Windows, or 32-bit applications, there is a theoretical limit of about 2.1 GB of RAM, and a more practical limit of 1.7 GB. The increase is only potential, because some algorithms or products will hit performance issues before memory becomes a problem.



### Memory in IES Products

This was typically the case with VisualAnalysis--we rarely ran out of RAM before we ran out of patience. However with VisualFoundation 4-6, we often had out-of-memory issues due partly to programming inefficiency with a new language and architecture, and partly due to the types of design-checks we needed to perform. Even so, we introduced an optional 64-bit implementation of VisualAnalysis 12.0 in **March 2015** to help engineers solve larger Moving Load, or Time History, or Direct Analysis projects, where memory could be a constraint. Because VisualAnalysis wasn't designed originally for the 64-bit platform, there were a number of limitations in that release.

The new 64-bit version of **VisualFoundation** is our first product released only as a **64-bit application**. You must have a 64-bit version of Windows running to use it. We've streamlined it so it uses significantly less RAM than version 6.0 did, but will also leverage all of the RAM installed on your machine.

Moving forward, we intend to release 64-bit versions of ShapeBuilder and VisualAnalysis over the next several months.

## Multiple-Threading

Modern CPUs also have multiple internal 'cores', which are essentially like multiple CPUs that can operate somewhat independently. When programs or algorithms are coded properly, they can take advantage of **performance gains by letting the system divide the work among the cores**. VisualFoundation 7.0 will run analysis on a separate thread (in the background) while you work. This doesn't affect the performance of the user-interface as you work, and has the advantage of giving you results much faster, when you need them. In the design-checks we can check each grade beam, for example, on a separate thread as the checks are independent of one another. If you have a 12-core CPU, you might get a 10x boost in performance in VF 7.0 vs. 6.0 for the same checks.

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## Customer Training

### Free Ways to Learn IES Tools

### Training at IES

At IES we earn our keep by creating and supporting **excellent engineering tools**. Our goal is that they should be easy to learn and use. Our philosophy is that you should buy the tools, but **training, documentation, or tutorials should be free**. While IES is not in the business of education, some training is necessary or beneficial. Not everyone has had the same kind of schooling or may need a little FEA refresher. And some features in our products (surprise!) are not completely obvious.

### Classroom Training: January 2017

We are excited to be offering a **live training** seminar in Bozeman, MT in January. The primary purpose is the grand opening of VisualAnalysis 13.0, but will also cover more general FEA and modeling topics and other products. Registration is open and limited. If it is very popular, we may offer more dates or locations.

[Register Now...](#)

### Webinars: Live and Recorded

We have on our web site recorded video webinars that we have hosted in the past. You'll find these on the Training tabs for our most popular or involved products like VisualAnalysis, VisualFoundation and ShapeBuilder. Pick the ones that are most appropriate and watch, pause, rewind, and skim to distill exactly what you need to learn. We can create or host more of these: please let us know if you have ideas for subject-matter.

### Feature Videos

Many of our tools also highlight new or more complicated features with very short feature demonstration videos. These can get you a quick 2-5 minute jump on learning how to use a particular aspect of a tool. They supplement the built in Help.

## Help File Tutorials

The documentation for a product **may** also include step-by-step tutorial instructions and projects that walk you through some typical scenarios when using the product. These provide a pace-yourself alternate route to understanding how we intended our tools to be applied.

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## Structural Engineer's Club

### Gallatin Valley Structural Engineers

#### A Model for Your Town

Engineers in Bozeman have been meeting once a month for about a year now for some **socializing** and light education. The brainchild of Dan VanLuchene, Ph.D., SE, and hosted by IES, Inc., we get together for a **couple of hours over a glass of beer or wine**. Each meeting brings in a local speaker to talk to us about their work, or their business. All of the speakers have been volunteers who seem to be genuinely happy about coming in to share. You might want to do something similar, here is why.

#### Learn Something New

Over the past year we've heard from two MSU football coaches (one was fired after a good run, but poor season). We've listened to a planning director, a professor of snow/avalanche research, a fly-rod manufacturer, a county commissioner, and an athletic director. We've also had some engineers tell us about their careers or a specific project that everyone can see driving around town.

This has been a good way to unwind, and frankly, to **get out of the office** for the last couple hours of a work-week. With about 40 local engineers, we get anywhere from 10-20 in attendance each month, including some retirees and an occasional baby or spouse.



#### How We Meet

Our group meets downtown in the Historic Bozeman Hotel, and we have a bartender to serve us each a beer or two. You could save on costs and meet at an office or maybe the library. But you really should do something similar in your neighborhood! It is a bit like [Pecha Kucha](#), or [TED talks](#).

#### Refer a Friend to IES

It would also be a great place to tell your friends about how much you like to use VisualAnalysis or other IES tools. **We'll even go so far as to offer to buy a round of beer** for your next club gathering, when a new customer tells us they heard about our products from an IES customer, like you.

If you want an IES engineer to come and talk to your club, you had better live in a beautiful, or interesting location. (Terry is thinking Kauai, or Key West, but if it's winter then anyplace with great snow would be acceptable...)

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## Commuting in MT



By Olivia, in IES Sales

## Prologue

As Montanans we already have a skewed view of what traffic and congestion really mean. Reality usually sets back in after we venture outside the state, to say, Seattle. For many of you commuting is tantamount to stop-and-go traffic for miles, diamond lanes, toll booths, zipper merging, road construction, road-rage, and much honking.



## An Empty Commute?

In stark contrast, my 35-mile drive into Bozeman leads me over the Bridger Mountain range on a narrow, windy road where road congestion is caused by wildlife and open range cattle, car-jackings are perpetrated by bears, and road rage surfaces when jackrabbits play chicken while I am trying to navigate greasy spring mud or winter snowdrifts. Vehicle traffic is scarce, cell phone coverage nonexistent, but drivers still wave. In winter I'd better carry survival gear in case my car breaks down as I might have to hike five miles to the next ranch house for help.



Past co-workers shuddered at my daily commuting adventure but still complained about their ten-minute in-town drives to work because they had to wait twice at the red light or it took an extra five minutes to detour construction work. They always seemed stressed out from driving, whereas I felt relaxed. I wouldn't trade these **wonderful chance encounters** with moose, elk, bear, deer, antelope, and just about every other species in Montana for the convenience of suburbia and quite possibly the detriment of my serenity.



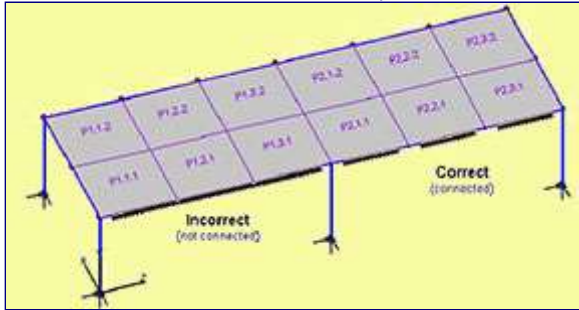
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# VA 17: Smart Members

## Streamlined Frame Modeling

### FEA Framing

Everybody who uses VisualAnalysis knows (or should know) that it is built upon the Finite Element Method. When you model frames with beams and columns, the FEA analysis requires that each member ELEMENT is connected via nodes to any other elements in the model. In the FEA world, there is no such thing as a girder that supports floor beams, or a two story column, as shown in this sketch from an early VA



help file:

### Combined Members Since VA 6

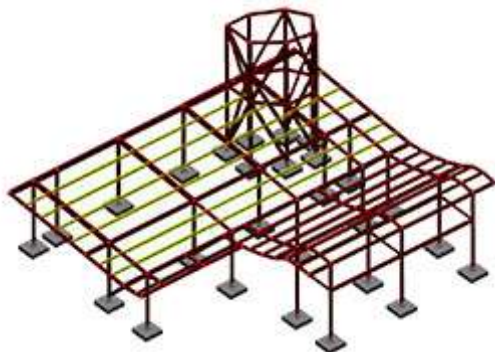
Approximately 10 years ago, VisualAnalysis has provided a Combined Member feature to let you see your structure in a more realistic way. You modeled a girder, and split it into pieces, connected other members to it, and then you could Combine it so that you could work with it as one piece.

With some fits and starts, this was a great time-saving feature, simplifying reporting and design. It also caused some headaches as things **could get misaligned**, or there were tolerance errors. But since VA 8 the feature has performed very well. Still, it requires some management and restricts your freedom in editing models. With complex sequences of events the data can get corrupted requiring some manual fix-up of the model.

### Engineering Elements in VA 17

With the forthcoming release of VisualAnalysis, we have **completely automated** the low-level ELEMENT connectivity of your model. Not just for members, but also for plate meshes, even randomly placed nodes. VisualAnalysis automatically creates the FEA model from your high-level model, making connections, splitting members into elements. You can draw or generate members that cross each other without worrying about HOW to connect them.

After analysis we will automatically combine the element results so you can view and design girders and two story columns without a thought.



### Staying in Control

That said, **IES has always shunned the black-box** approach where you don't know what is going on or you don't have any control over it. You can still build your perfect FEA model and VisualAnalysis won't have to do any splitting or mapping. You can also tell VisualAnalysis when to NOT connect crossing members, for whatever reason.

Not only will you **build models faster** in VisualAnalysis, they will be more accurate and better checked. We are working hard to help your quality as well as your productivity.

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