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10 Useful (and Cool) Forge Applications

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Learning Objectives

- Understand what Forge is.
- Understand the capabilities of the Forge APIs.
- Ideate how to use Forge in your own applications.

Description

Join us on a lightning tour of Forge-based web applications Through the medium of demo apps, you'll find out what Forge is; what it can (and can't) do; and pick up some interesting ideas for how you can make use of Forge to enhance your own applications and workflows.

Your Forge DevCon Expert(s)

Stephen Preston is worldwide manager for Autodesk's Forge Partner Development team. He and his team have two jobs: to help you use the Autodesk Forge APIs as a platform for your own solutions, and to tell the Product Development teams at Autodesk what APIs you need to build those solutions. Stephen lives in California with his wife, dog, 2 cats, and 3 chickens.

Jim Quanci Senior Director, Software Partner Development Autodesk, Inc. With more than 30 years of engineering and design experience, Jim Quanci has spent the past 25 years developing relationships for Autodesk with leading technology partners around the world. He oversees an international network of over 4000 software partners – ISVs, Consultants, and Autodesk customers - who customize, complement and extend Autodesk Cloud, Mobile and Desktop technologies. He is currently leading creation of a new cloud based ecosystem of partners leveraging Autodesk's Forge web services Platform. Prior to Autodesk, Jim worked at Sun Microsystems and General Electric. With a BS in Mechanical Engineering and an MBA in International Marketing, Jim is a frequent presenter and consultant to leading design and engineering software firms on software development technologies applied to design and engineering. Twitter @jimquanci LinkedIn Jim Quanci Blog http://dances-with-elephants.typepad.com/

Introduction

At the time of writing, the Forge platform consists of the following APIs:

- **Data Management** – Provides read/write access to data stored by customers using Autodesk Forge-based SaaS products, including BIM 360 Team, BIM 360 Docs and Fusion 360 Team. (Obviously, each user has to grant your application access to their data). Also allows your application to upload data to a provide storage area (called the Object Storage Service – OSS).

- **Model Derivative** – Extracts data from a design files, and allows translation between different file formats. Data that can be extracted includes thumbnails, object data, and geometry (meshes and textures). Supported formats and possible inter-format translations are listed here.

- **Viewer** – A zero-client (WebGL) interactive 2D and 3D large model viewer. To view a design file in the Viewer, it must first be translated to the 'SVF' format using the Model Derivative API.

- **Design Automation** – A headless version of AutoCAD (and soon Revit and Inventor) running on a server that allows batch (i.e. without user interaction) processing of DWG files to either modify the original model or to extract data from the model.

- **BIM 360** – Allows automation of admin level tasks for the BIM 360 products.

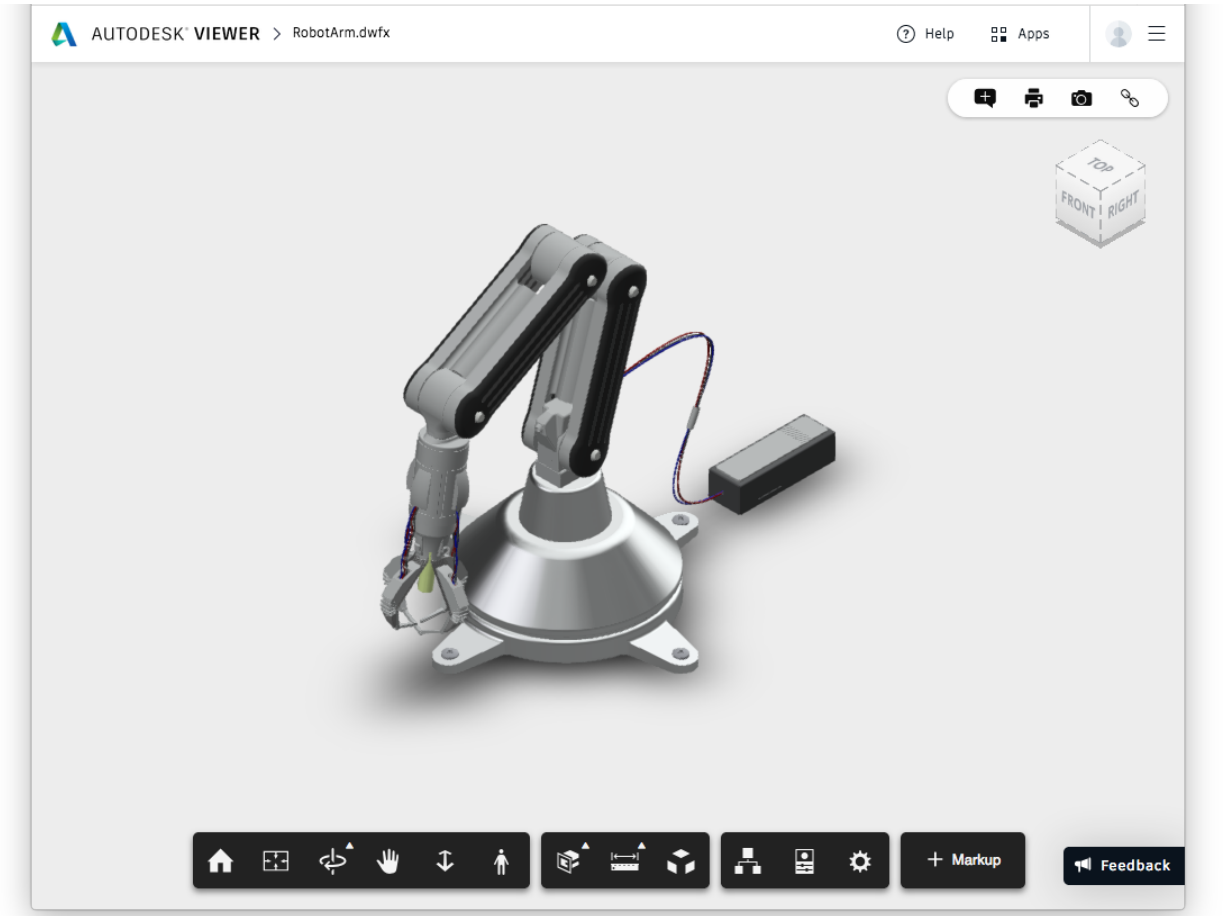
In this class, we will run through a quick-fire series of live demos showing how these APIs can be combined to create powerful web-based workflows and applications. The live demos will be a mix of online samples written by the Forge Partner Development team, and applications written by Forge early adopters.

Sample Applications

We may show more (or less) than 10 applications during the class. It all depends on how quickly we can get through them, and how many questions are asked. And our list of favorite apps is fluid – we keep finding new cool samples all the time. Therefore, instead of trying to give you a list of applications we'll be showing in the class (knowing that the list will change), here are five simple live samples you can look at before AU to whet your appetite.

A360 Free Viewer

(https://viewer.autodesk.com)



This Autodesk website exposes the Forge Viewer implementation used in A360. Once you've signed in with your Autodesk Id, you can upload a design file to test the viewer functionality. This is a great place to understand the basic features you get 'for free' when you incorporate the Forge Viewer into your own application.

Once you've uploaded your design file (ideally a 3D model), try right clicking on elements in the viewer and selecting options from the right-click context menu. Also experiment with the buttons at the bottom of the viewer to see how the standard measure, explode, section, object tree and object properties features work.

Hint: 3D DWF files translate and load really quickly, Revit and Inventor files usually contain very rich object property data, and Fusion files have the nicest looking materials.

Viewer Rocks!

([https://viewer-rocks.autodesk.io/)](https://viewer-rocks.autodesk.io/)

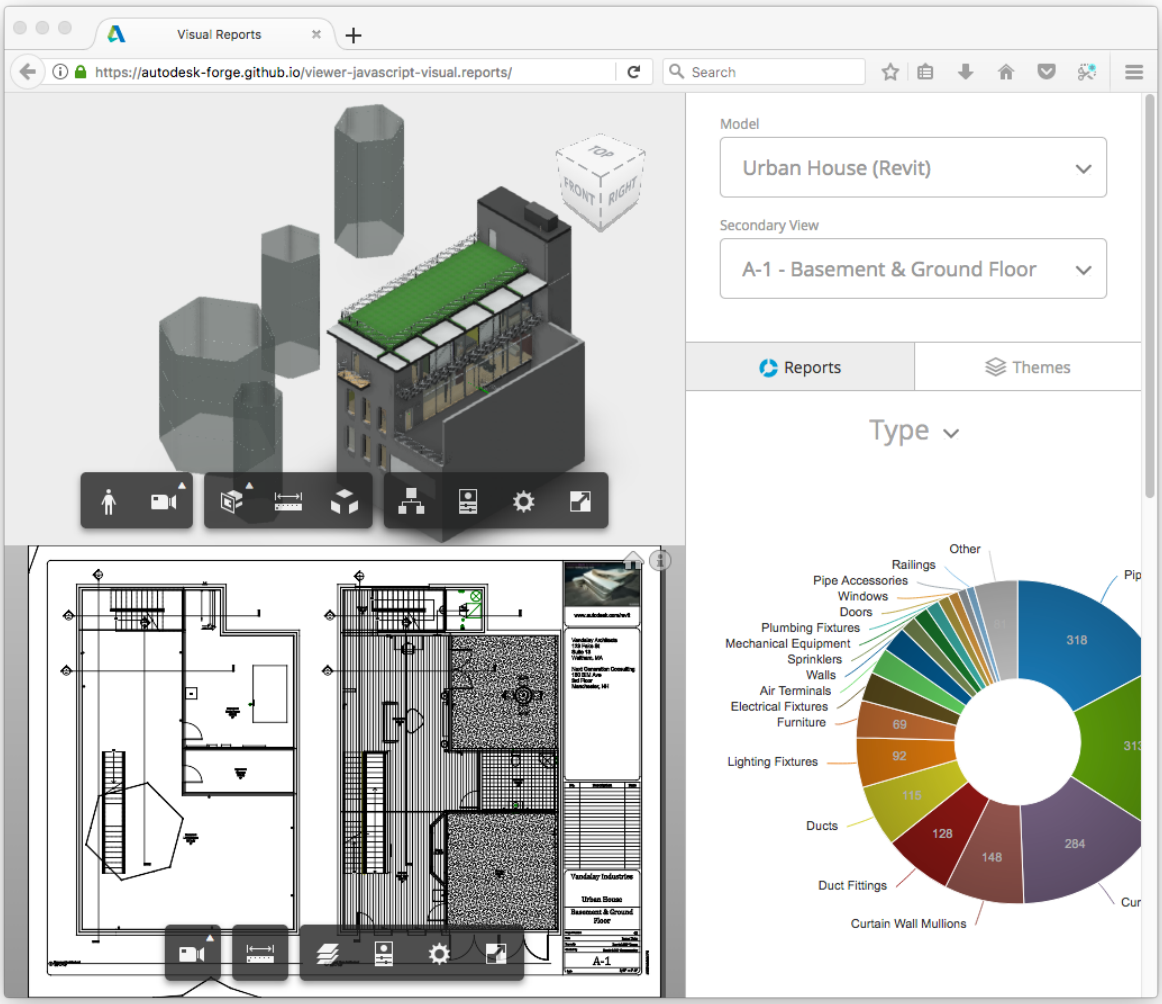


This is an example of how you can 'skin' the Forge Viewer with your own (custom) UI. At first glance, this looks like an image of the go-kart at the top of the screen, but it's actually an interactive 3D model.

Click on different models in the gallery to load them at the top of the screen. Click on the little orange circle with the diagonal white arrows to open the model into a full page view.

Visual Reports

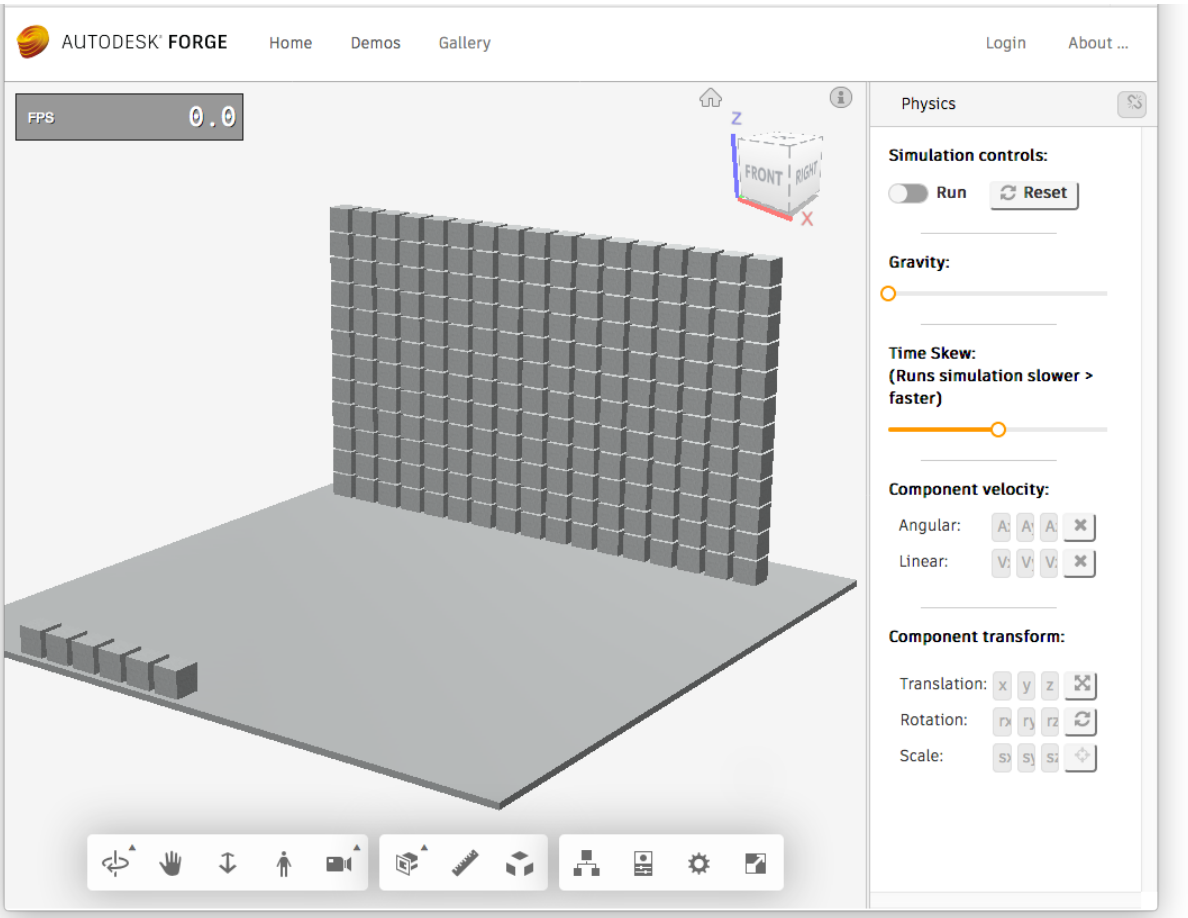
(https://autodesk-forge.github.io/viewer-javascript-visual.reports/)



A Revit model usually consists of the 3D model and various (2D) sheets. This sample shows how the 3D and 2D data can be linked. Click on one of the elements in the 2D model (a stairway, for example). The 2D elements can be a little hard to click, but should turn green when your mouse is hovering over it. When you click on the 2D element, you'll see the same object highlighted in the 3D model. Similarly, click a category in the pie chart ('Doors', say). You'll see that all the doors are highlighted in both the 3D model and the 2D sheet.

Physics

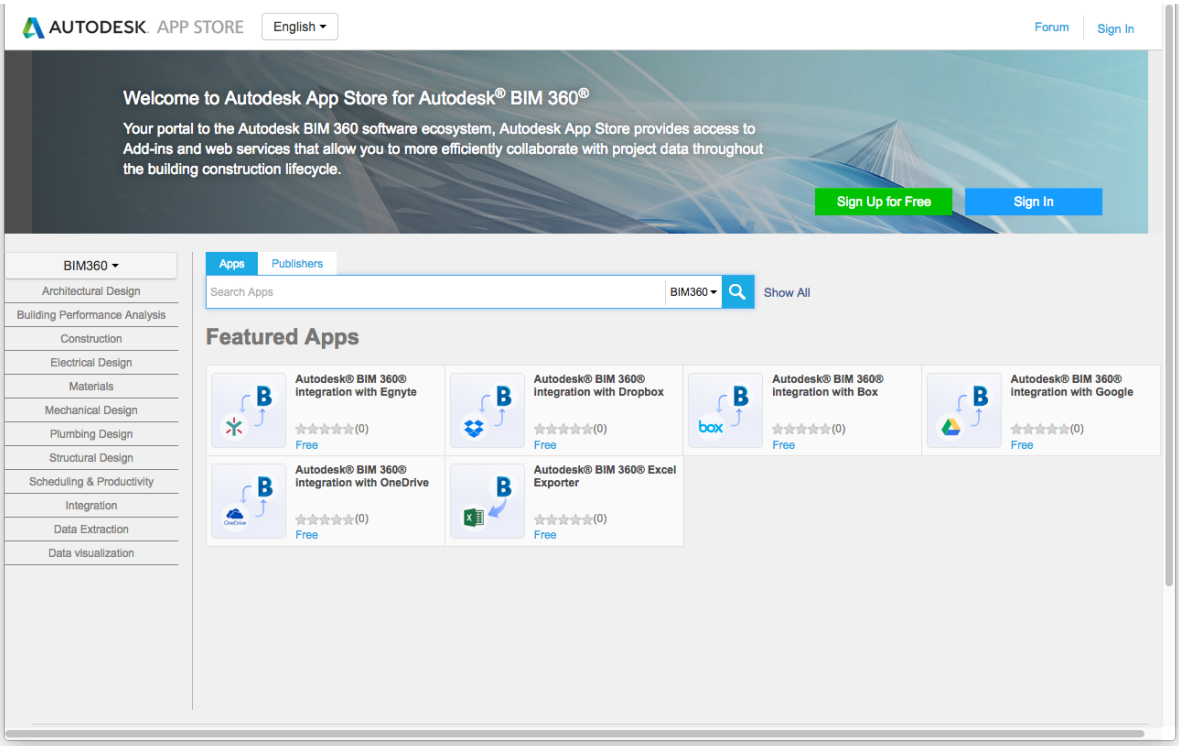
(https://forge-rcdb.autodesk.io/configurator?id=5959fa67f8b8e4b500e7ec35)



I like this sample, because it demonstrates how customizable the Forge Viewer is. The Forge Viewer is a JavaScript component built on top of THREE.js – the de facto standard JavaScript library for 3D graphics on a web page. By customizing the viewer at the THREE.js level – or even at the WebGL level – you can implement some serious customization to the displayed models. This demo is an integration with the ammo.js physics library. Click the 'Run' switch to throw the bricks into the wall.

BIM 360 File Transfer Applications

(https://apps.autodesk.com/BIM360/en/Home/Index)



We tend to show the Forge Viewer a lot when we demo Forge – that's simply because showing interactive 2D and 3D models on a webpage is cool. Being able to copy files around is at least as important – it's just that watching files being copied doesn't make for such an exciting demo.

But Forge isn't just about the Viewer! For example, we recently launched the BIM 360 Apps store. By AU, there should be quite a few additional apps listed there, but we've seeded the store with a bunch of applications that primarily help you copy files between BIM 360 Team or BIM 360 Docs and various other online file storage solutions. These web apps are free, so go grab the one you want and have a play with it.

Resources

We hope that, by the end of our class, you'll have seen at least one demo that gives you an idea for an application you could build to improve your own or your customers' workflows. (And please come and talk to us after the class if you want to discuss your ideas). In the meantime, here are a few links to additional resources to get you started:

- For a general overview of Forge, visit https://forge.autodesk.com.
- The Forge APIs are documented at https://developer.autodesk.com. The documentation includes an overview of each API, step-by-step tutorials, and API reference guides.
- We're developing a set of SDKs to make it easier to call the Forge REST APIs from the server-side language of your choice - https://developer.autodesk.com/en/docs/quickstarts/v1.
- Our 'official' sample library is available on GitHub - https://autodesk-forge.github.io/?Samples.
- The Forge Partner Development team write a lot more samples than the official sample set. We typically publish the code for these on our personal GitHub repositories and write about them on our Forge Blog - https://forge.autodesk.com/blog.
- If you need help with using Forge, we offer support via StackOverflow and email. Find out more here - https://developer.autodesk.com/en/support/get-help. (Note - You must be signed in using your Autodesk Id to see all the information on this help page). However, since you took the time to read our handout, please don't hesitate to email one or both of us if you'd like to arrange a call to talk through how you can make best use of Forge. Our email addresses are: Stephen.Preston@autodesk.com and Jim.Quanci@autodesk.com.

We hope you enjoy our class.

Cheers,

Stephen and Jim