ALEX LOBOS: We're going to get going. Nothing like some technical opportunities to take care of before the presentation. Thank you so much for being here today. My name is Alex Lobos. I am very excited to show you something that I've been working on for, I guess, ever since I thought about what classes to teach here. And then it got accepted, and I thought, man, now I need to make it work.

So let's see. We're going to go with this instead of the full screen, at least for this part. This class basically shows a workflow that combines Fusion 360 and Memento so that you can jump between physical models and digital models. Just to get a sense of the audience, can designers raise your hands? Cool. Engineers? Great. Very cool. Something else.

AUDIENCE: [INAUDIBLE].

ALEX LOBOS: Interesting. Awesome. Love it. Great. So something that I think that all of us resonate with is the idea of creating something very cool with your hands, a mock up, or something some really nice accident, and then feeling very frustrated with being able to transfer it to the digital world. And I think a lot of cases you even see situations where you have CAD model that you were able to design a designer, and then another CAD modeler needs to reinterpret that geometry. And then you see some fights between it's not curve. Yes, it's a curve. No, it's a curve, but not the curve that I was thinking about. So that's kind of what inspired this class.

Basically, you'll see how fusion is very useful for creating very quick models, creating geometries that are very useful for concept development. We're also learning how to use some other software I'm going to focus on Memento, but most of the workflow is the same as in ReCap and also very similar to 123D Catch. We will also talk about some different options of transferring data between these spaces, and also I'm going to use some features for modeling infusion that I think that some of you will like.

So some issues that I see that [? creatives ?] got between physical and digital spaces-- one is basically that a lot of aspects are easy to do on the computer, and they don't necessarily work in the real world. So we can trust that our CAD model will work, but that's not necessarily the case.

So let me tell you a story. You are young. You are happy with life, and then you're thinking that you can play with a computer one stormy night. I don't know if any of you recognize these

characters. So you start playing with some pictures. You have some heavy duty computers. You start making things happen and you get lucky. Everything went great. What I want to point out is that we are not always lucky. This might happen too.

So that's one of the gaps that I see. The other one is design intent on being able to transfer it to the computer. A lot of times you have these sketches with very interesting lines. You were thinking about certain geometry, certain curves, et cetera, et cetera. You get to the software, and you basically get what you get. You don't get upset. You can do your best, and sometimes the best is close to the design intent, but there's something lost in translation in there.

The third aspect-- and this is a very common way for trying to close that gap is that we use a lot of Canvas reference. This is very cool. It's very useful, and it gives you a lot of input, but I'm sure that just by looking at a picture of that beautiful car I'm losing a lot of detail. I'm losing a lot of element sensitivity that went into creating those surfaces that cannot be captured in regard to the image.

So what I'm proposing today is basically a workflow that looks like this. We start at the top with physical mockups that we create very quickly, and then we use image capture software to transfer them into Meshs. So there's ReCap. There's Memento. There's 123D Catch. There's a few more. You can also use a 3D scanner. Most places that I talk with-- and there's the same issue at RIT-- everyone class one or these. There's very few 3D scanners around in the studio. Same thing with a lot of workshops, so that's something very powerful for using this software. We'll get into more detail in a second.

Once you capture that data, you can go to Fusion 360, where you can play with it. You can import it. You can do a lot of things with it, and then you can 3D print it, and then it goes back to the real world. Bless you. Once you are there, if you are happy with that, then you are done. If you're not happy with it, you can tweak it. You can do something to the physical model, and then you start the cycle again until you are satisfied.

This is basically what I want to show you today. I decided that I wanted to develop a rotary tool. Dremel has now these rotary tools that have a handle so they give you more precision when you are using them, and basically you see here a workflow that went from a very primitive model made out of PVC, clay, and masking tape transferred into Memento, then into Fusion so that you can have an initial model. And then I 3D printed that, then edited it, et cetera, et cetera until I get I finally design.

This is how everything got started. So I'm sure that this is very common whenever you're thinking about how things can work. This is a very good way of getting things started. What I want to make sure is that we try to improve the design intent as we go along this workflow. Once you have your model, the way that these programs work-- but I'm no expert on these programs by any means, so there's a lot of very cool tutorials if you're interested in this technology-- but basically the way that it works is that you set up your model in a platform, and then you start taking pictures around it. A good model will need about 100 pictures, and that's the question that I get asked the most. Taking 100 pictures with this phone just going around the model every 5 to 10 degrees takes about three or four minutes. A lot of people think that it's going to take an hour just to take those pictures. That's not the case.

As you can see here, this was taken outside. It was a cloudy day. Lucky me, because that gave me very soft shadows. If you have a very sunny day, that gives you harsh shadows, and that makes it harder to get a good model. You can also set up a studio, something with soft light indoors, whatever gets you to play with it. This is a very fun workflow if you want to experiment with it.

So once you have all of your images, then you have these three options. You have Memento, ReCap, 123D Catch. There's one catch. If you want to play with your data in Fusion, you need a file that's OBJ with quad phases. Tri phases wouldn't work. Memento can do that, and that's why we need Memento. So let's get to it.

[VIDEO PLAYBACK]

-Speed is of the essence.

[END PLAYBACK]

ALEX LOBOS: Yes, we're flying in here. So this is the Memento interface. So already went outside. I already have my collection of photos. I go to create a file, a new 3D file. In this case, I select my local drive, and I have the pictures in here that I took. I select all of them. They're getting uploaded, and I hit Create Model, and then I enter a name. Quality, draft, and best-- if this is just for a quick reference, I recommend draft. You will get your model back quickly. If you select best, you can get a lot of detail. By detail, I mean I've seen fingerprints that I had on the clay of my model coming out in the model.

A model of that quality will take between an hour and an hour and a half to be processed. If you have a draft version, it will take, I would say, 30 minutes, 45 minutes, depending on how happy the server is. A few advanced tools-- smart crop will kind of reduce the environment that you're taking, so I recommend that you use it. And the smart texture-- again, it depends if this is for a quick reference or review. [? Are you ?] really looking for a lot of detail in your model?

So once you do this, you hit start, and basically what happens is that Memento will upload all of these images to the cloud, and that's the power of the cloud. All of these geometries not being calculated in your computer is being calculated on the cloud. Once the model is done, you will get an email letting you know that everything is good. So again, that takes between 45 minutes an hour, depending on how complex the model is.

So once you have that, you can see that in here the pictures are uploading. Once your model is done, you will see the model in this workspace. So at this point, you can basically-- with the magic of a demo at AU my model is done, and it's right here. So now I can basically just click on it. There it is. Let me just refresh. So that's the model. Very cool, isn't it? So I can zoom in.

Memento is still a beta, and it's even more of a beta on a Mac, so be patient with it, but all of this class was done on the Mac version, and I didn't have any issues with it. So once I have the model in here, the first thing that I want to do is get rid of the extra stuff that I don't need. I go to edit-- oh, sorry. I don't even need to go to edit. I simply make a window. Those portions are highlighted, and I delete it. I rotate the model. We were having issues with display, and I think I'm paying for it. So this is very straightforward. The only thing that you want to make sure is that you don't delete part of the model in the process.

Once you are getting close to this, basically the top section of your model is free of anything extra that you don't want. You go here and you select the samurai feature, also known as slice and fill. You basically bring down your orbit until you see the model, and this has a couple of features. One is that it removes the excess. The other one is that right now that model is open. Does that make sense? So you have a black hole where that screw section was.

When you use this people and you use it at the right height, that also closes the model. So now you have a closed model that you can use as a good Mesh for exporting. So this is what I'm doing. I hit Apply. So now this is good, and just so that you see that I'm not lying, those are the fingerprints.

AUDIENCE: Is that actual geometry, or is that photography?

ALEX LOBOS: It can be actual geometry.

AUDIENCE: So those fingerprints are [? actually going to be ?] [? on there? ?]

ALEX LOBOS: Yep.

AUDIENCE: OK.

ALEX LOBOS: It also depends on how many faces you have, and that's something else that you need to keep in mind. I mean, if you have a very detailed model, then you need a very powerful computer and a lot of patience.

AUDIENCE: How many polygons [INAUDIBLE]?

ALEX LOBOS: You got me there. I think I have about 10,000.

AUDIENCE: 10,000.

ALEX LOBOS: But I might be lying. One thing that you can do, too, is to reduce. I have 65,000. Wow. Now you guys are going to go. You're going to leave me here because I'm a liar. You can bring down the number of faces, and you can also select best geometry. That will kind of smooth things out so that this is an easier model to work with.

If you want to improve your model furthermore, there's a few other tools in here that are very cool. They are called surface tools. So for example, you have basically sculpt, which will inflate the geometry. Smooth will flatten it. So if I go to smooth, for example, I just start playing with the model. So this is very useful in this case if you don't have a perfect geometry. I just wanted to show you the tool so that you know that it's there. In this case, I'm using these just as a reference, so I don't need to spend a lot of time playing with the model. I will commit to it, and once I'm happy with that, I export it.

There's a few formats, and the format that is the money maker here is OBJ quads, again, because it gives you the quad faces. If you need a model to be used as a basic reference, I will say that between 500, 700 faces is more than enough. Around 1,000 faces things start getting a little bit more complicated, and what I heard-- and I've tested it, too-- don't got over 2,000 faces, because then it's just too much data for Fusion to handle. The software will start crashing.

So I can go with 750, and then I hit export, and then I will give it a name. And then that will save it whatever I told it to. So let's go back here.

So I have my model in the real world, and now I will have a mesh model. And then I can bring that into Fusion so that I can create a refined version of it. So for that we go to Fusion, and of course I have to do this again.

[VIDEO PLAYBACK]

-To the Batmobile.

[END PLAYBACK]

AUDIENCE: Were you even alive when those were made?

ALEX LOBOS: I guess so. Wow, this is going to be interesting. So in Fusion, I go to-- hold on. I need to refresh [? this ?] [? plate ?], because it's not--

AUDIENCE: [INAUDIBLE].

ALEX LOBOS: This one?

AUDIENCE: [INAUDIBLE].

ALEX LOBOS: Let me open it again. I'll see what happens. I was doing it in Memento, and it wasn't working. So in Fusion, you go to sculpt. That's where the magic happens. When you are in sculpt, you go to Insert, and there's an option for insert mesh. And you select the file that you created in Memento.

I forgot to tell you about dimensions. When you are in Memento, you can set the scale and units. So if you press here, you basically define two points, and then you tell Memento what distance that is. So that's how you set the scale. So now that I told you that, I can go back here and set it up in centimeters. So now I have my model in there.

I'll talk about what options I have for the model in a little bit. Right now I want to make sure that I put it in the right position so that I can-- so I'm just rotating the model. Basically what I want to do is make sure that it's sitting in the middle of the workspace. Bless you. I don't know if this has happened to you. Sometimes when you rotate the model with move, then the orbit shifts a little bit, and then it's hard for you to find true dimensions. If that ever happens, simply press

OK, and then repeat move, and then that kind of resets the orbit.

So I'm basically just moving this. That silence, I love it-- the suspense. Will it work? So the model is there. There's a few options. You can use the model as a reference so that you can model over it, and this by itself is way better than using a 2D canvas, or you can also tweak with the model. I'm going to show you two iterations.

The first one I'm going to use it just as a visual-- as a three dimensional reference, so I won't necessarily be touching the model. For that, I will create a shape-- an object, rather, in Fusion. When you go to create-- and I like to spend a minute on this. You have a few options in here in terms of different shapes. My favorite one-- and this is the one that I use 99% of the time-- is [? quad ball. ?] The reason is very simple. If you look at some of these geometries, they have some faces that have four corners and some other ones, and I think [? the sphere is ?] the worst one. They come to a single point. That is a complete nightmare whenever you are trying to manipulate the geometry. If you have a [? quad ball ?], you have four corners all around. It's very simple. It's a very docile shape. You can do pretty much whatever you want with it, so that's what I recommend.

I select the plane. I'm going to go here, and again, this is just kind of a visual reference. I'm going to set this to 30, and I'm going to set symmetry. I want to mirror-- basically I want the left side and right side the same. So I see the green line in there. That means that it has symmetry. That's what I need. So I hit OK.

Just as [? quad ball ?] is my favorite shape in Fusion, Edit Form is my favorite tool. You can do pretty much whatever you want with it. Basically, in here I'm selecting faces, and I'm turning this-- I'm going to turn this into a cylinder. I basically pull on the handle, but I'm holding the Alt key, and that creates new geometry.

Now I reach to that end. Now I want to start creating the tip. Instead of holding the arrow, I'm holding the center of the orbit, also with the Alt key, and that creates a step, and I can scale it. So in this case, I want to scale it down, bring it in so that I have more of a tight transition. I select this face again, pull it out a little bit, scale it. And if I'm being ambitious, I can select this line. Clicking twice on it, chooses the entire loop, so I'm done with that section.

Now I can kind of do the same. Go back to face select, and I start pulling with my Alt key held. One, two. I think I need one more. Now I move to the orbit. Pull this in. Orbit again-- sorry, Alt key again. I now-- with the side scale I just bring that and flatten it out.

So for a quick concept, I'm super happy with this. I'm only using one tool, and it looks very close to my design intent. If I want to play with it, it's not ready for manufacturing, but it will definitely be ready for experimenting with it. So that's basically my top portion. I'm done with it.

Now I'm going to start playing with the handle. I'm going to create the handle as a separate section, and then I will blend the two together. So guess what I'm using? [? Quad ball. ?] Every time I use [? quad ball ?] an angel gets his or her wings. Mirror is set, so it has a left and right position. Go to Edit form. Faces. Kind of the same thing again. And at this point, I'm going to flatten this so that it has that transition. And I'm going to rotate this, because when I rotate the angle of the handle, that [? should ?] be kind of straight.

I'm going to flatten the bottom two, and at this point, I just want to make sure that I make this a little bit more elliptical. So I'm selecting the entire shape, and I'm making it a little bit narrow. Basically, what I'm looking at is this width. That's [INAUDIBLE] the points there. So that looks right. I go to the side view, and I just get this right. Again, this is just a quick reference, and now I'm rotating it. Go back to faces.

So at this point, I know that I will blend this with the top portion. I want to make sure that I have a nice transition, so I'm actually going to help the geometry a little bit. I'm going to do that just by expanding this a little bit from this side and same thing on the other side. That will kind of guide the transition.

So at this point, I want to connect these two faces. Let me turn off the mesh so that we can look at them. For that, I will use bridge. Has anyone in here used bridge? Yeah? Cool. So one of the golden rules with bridge is that you want to make sure that you have the same number of faces, otherwise it won't work, or it will create very tricky geometry. So I will add adapt each side so that this works.

Basically, I want to clean this up so that I only have four faces. The simplest way of doing that is just selecting these [INAUDIBLE], and I'm holding the Shift key so that I can select multiple and then hit delete. So that cleaned up that face. Now this is looking good, but in here, I have two faces on this side. I have three over here. I can select that loop and hit delete. So I'm very close.

The next thing that I want to do is that I want to shift this a little bit so that it's more aligned with the center line of that handle. So I go to [? slide ?] edge, and I basically move it here. So now

it's close enough. Now I go to bridge. One, two, three, four. Go to the next body. One, two, three, four. And the other thing-- in here you will see the faces. Those are basically the number of transitions you will get to create that blend. I like to keep it simple, because I think that that makes a more gracious transition. So I bring it back to one, and I hit OK, and there you. Look at that baby.

If I need to adjust, with Edit Form I can move this, bring it up, down, et cetera. I'm actually quite happy with how it turned out, so I think I'm going to leave it there. So at this point, I can finish the form, and then in here, I go back to the model mode. And if I right click there, I can save it as an STL, and I can print it out.

Once I did that, I got this model, and I started holding, and something that I realized was that the position was not right. There was a gap between the handle and the back of my hand, so I took out some clay, and I started adding material to it. I took out a Dremel to refine this Dremel to cut out some holes, because I wanted to make sure that there was a position for the thumb and for the index. So I had this shape, and for the second iteration, instead of taking the pictures outside, I had a blanket background with some soft light. A very cheap way of doing that-- if you have a spotlight, put a white plastic bag in front. That will soften the lights. Don't tell that to any photographers. I hope that no one is in the room, but it works.

So once I did that, I went back to Memento, kind of the same workflow. So now let me show you the second part. So in here, I have a file that has two bodies. I imported the second file. So this is the refined one. You can see that it's a lot more smooth. It's basically the one with clay that I got in Memento, and then I have the file I have in here.

Let me talk a little bit about what to do with this files, because I've been telling you a lot about OBJ, quads, all the beauties of it. That This is what's happening. Right now, this file is able to exist in Fusion, but I cannot do anything with it. I cannot play with it. I can just move it around. Some people call that a dumb model. If I select it and right click on it, I can convert it. I hit OK, and now it's a T-Spline model.

So that's awesome, because now it's really part of fusion. It's not the ugly cousin. Now it's really immediate family. There's an issue with that. As much as I love that this is a T-Spline model, if I want to edit it, it's a nightmare. So what I recommend is this. If you have a model that has a lot of detail and you are able to keep that model in there without adjusting anything, then this is a good way of doing it, because I can remove some faces, and I can keep that

section. And that will maintain the design intent 100%. If you have a model that you want to keep tweaking, then you need to find a way of capturing that geometry as best as you can, but also having a simpler model.

So for that, Fusion has a feature called pull, and the way that I like to describe it is basically shrink wrap. You have an object, and then you have a surface, and then the surface shrink wraps to whatever geometry you in there. So that's basically what we are going to do, and what we are going to do, too, is-- so let me go back. In order to do that, you need this as a mesh. Don't use it as a T-Spline.

So I'm going to use the first iteration of the tool that I have, because it already has a similar shape. I don't have to reinvent the wheel or try to create new [INAUDIBLE]. What I will do is this. I will copy this and paste it, and that copy is going to be the top section. Let me explain to you why, and I think this is kind of a cool thing about what we're doing this.

I basically want to keep the top of the model the way that I had it at the beginning. For the handle, I'm very interested in the human [? factors ?] that I captured with the model, so I'm going to use pull to shrink wrap to mimic that section, and then I will blend that with the original model. So that's a very cool way for you to combine different types of geometry.

So for the top section, basically I want to remove the handle. So I'm just selecting faces and hitting the Delete key. And then for the handle I am removing everything else. That's kind of [INAUDIBLE]. You see that-- let's hide this for a little bit. You see that I have some points in there, but my top model has round corners, so I'm going to help Fusion a little bit with that. I'll basically bring down these faces, and since I have symmetry, select it. I should be able to do this, and I'm just pulling this out a little bit just to make sure that the geometry doesn't get overly complex. I'm going to bring this down, too, a little bit. I said a little bit.

So now I have that shape. I'm going to bring back the mesh. The way that pull works is that you have the T-Spline geometry and that every point in that geometry will look for the closest mesh surface, and then it will pull it there. Sometimes that works very well if you just go at it. Sometimes you need to help Fusion a little bit because then it won't know that you want it to go slightly down, and it went slightly up instead. Does that make sense?

So in order to do that, I'm just going to move these T-Splines, they handle a little bit. So I'm bringing this down. And the easiest way of doing that is basically if I have my edge selected, I can just pick these lines and bring them down. I don't need to be super precise. I'm just

helping it out a little bit. I mean, you can be super precise, but you can kind of wing it.

In this case, for example, for this line, I'm not only extending it, but I'm also bringing it up a little bit so that I help with this curvature. For example, for these lines, I'm bringing these down. So this is getting a lot closer. This part I want to see how I'm doing, so let me just turn it off. And I'm bringing this down. It's actually not that bad, and I'm just going to turn this on the sides. It looks OK. Cool.

So now I'm ready to use pull. So you see that now all the points are there ready to do whatever I tell them to do. The model that I created is not symmetrical. I did it by hand. I'm not that good. So left side is going to a slightly different to right side. What I'm going to do is to select just half of the points, and since I have symmetry applied, that will make it symmetrical. One of the sides won't be exactly accurate, but it will be very close to what I need it to be. If this model is asymmetrical, then I select all the points, and then they will pull to the surface that they want-- that they need to, sorry.

So I basically go here, pull. I select this, including the parting line, the midpoint, and see what happens. Now the points are all shrink wrapped to the surface. Bless you.

You have two options in here. One is control points. That puts the points that define the curve on the surface, but that actually makes the geometry itself a little bit smaller. If I use surface, the lines are right on the surface, so I hit OK. So now that model has the design intent that I captured with the model. Let me turn off the mesh. So you can see how it morphs.

AUDIENCE: Can you just [INAUDIBLE] again, because I think I some of that.

ALEX LOBOS: Sure.

AUDIENCE: [INAUDIBLE].

ALEX LOBOS: So you go to edit and then pull.

AUDIENCE: Pull.

ALEX LOBOS: So let me turn this back. So now I bring back the top, and I just need to reposition the top. So I select Edit form. I'm selecting everything in here, and as much as I can, I don't want-- it's obvious at this point that I need to move some of the geometry. I'll try not to touch the handle that much. I will need to bring it down here because otherwise it's overlapping the geometry,

but for everything else, I want to make sure that I keep that. If you notice that it's getting in too much, I suggest that you go back and move the surface before you do the pull. Otherwise you've got the design intent, and then you're losing it again, but right now for the sake of time, let me just show you what's going to happen.

I'm basically selecting lines. I need to bring this back. so that So there's more space, and now I'm just bringing this down a little bit. So that's kind of what you want in here. So I hi OK. One of the cool things that happened because of me cloning this is that right now the top section and the handle section have the same number of faces. So now I'm going to use bridge again to connect them, and I don't have to worry about do I have the same number edges, vertex, et cetera, et cetera.

AUDIENCE: [INAUDIBLE].

ALEX LOBOS: You should, yes. And actually you'll see that once I select bridge, I need-- well, I need to go all around the loop. So although it has symmetry because you see the green line, I still need to make sure that the loop is closed. So I go to bridge. I double click on the first one. Very easy. It went across. For the bottom section, I need to work a little bit harder. I bring this down to one. Yes. I can sleep tonight.

So this happened because of the adjustment that I needed to make, but you guys get the idea. Basically at this point this was my goal. I was able to keep the shape of the handle based and my exploration with the physical model, but I was able to blend it with a model that was created digitally. At this point, if you want to, you can keep playing with it. For example, something that I added at this point was a crease. In terms of design, I actually want to highlight that transition, because I think that it can create a very nice contrast-- the softer, more organic section of the handle with the more geometrical section of the top.

So crease basically sharpens those edges. So you can see that now it's a harder transition. The other thing that will happen-- I don't know if you can see it in here, but because of the way that I did the blend, there's a little bit of overlap here in the geometry. The surface didn't get enough chance to go back. This is kind of an easy fix in this case. I'm just selecting lines, and then I just pull them out, and that gives the geometry room to breathe.

So I hit OK, and I should be able to finish the form. So now it's a solid again, and I can do the same thing. I can do the STL, save it, print it, et cetera, et cetera. So basically this is how the model looks like when you're finished, and this is why I was interested in using crease-- so that

I could really show that transition that I think in this case really highlights the design. More CAD [INAUDIBLE] so that you can enjoy the view.

So the key benefits of the workflow are it's very easy to transfer CAD data and physical data. So I know that it involved a few steps. It's actually a lot of fun. I had a lot of fun playing with this, and I think that it's very useful, especially when you have something very cool in your hands and you don't want to let that go. It's easy to import the models into CAD, and then you have a few options so that you can use them as reference. You can turn them into T-Splines that are kind of tricky to manipulate, or you can use simpler geometry to transfer those shapes that you have, and then you are able to do a lot of things.

This is basically the workflow that I explained today. The idea with this is that this is an interactive flow. The more times that you do it, the better that your design will be. And I'm preaching to the choir here, because we are used to doing that until our boss or client says, OK.

And then for me, the main reason of this was basically getting rid of lost in translation. I spent a lot of time creating a model, and then at some point, I just had to give up and accept something that was kind of close. And I think this is the key part-- that you are actually able to combine and to blend these types of geometry. So I would like to hear your thoughts, insights, comments. You can use your mobile, email. There are some kiosks around, and also if you want to relive these beautiful moments, or if you want to check out more details on how the flow works, make sure that you go to the AU website. The hand outs are available in there so you can access them, and that's pretty much it. Thank you very much.

[APPLAUSE]

Any questions or comments? Yes?

AUDIENCE: You had said earlier that the functionality of Memento is different on PC versus Mac. Is that including how [INAUDIBLE] just the front end.

ALEX LOBOS: No, everything is the same. The functionality is the same. The difference is that they started developing the Windows version before they did the Mac, so the Mac is behind a few builds.

AUDIENCE: [INAUDIBLE].

ALEX LOBOS: So if you download the Windows version, it's going to be more stable, and it's going to have a

few extra features that the Mac doesn't have yet.

AUDIENCE: [INAUDIBLE]?

ALEX LOBOS: Yes. And Memento is part of the 360 suite, so your files actually go to your AU 360 file. So you can open them in any-- you can open them in Fusion, any file.

AUDIENCE: [INAUDIBLE] or something. Where does Memento fit between Catch and ReCap? That is has a Meshmixer features on it?

ALEX LOBOS: I don't know. I mean, there's a session on Memento tomorrow. I'm very curious about it, too. A big question that I have is that I look at mesh Meshmixer, ReCap, Memento even some parts of 123D Catch. They look very similar. So I kind of wonder why there's a lot of--

AUDIENCE: Well, the brushes were right out of Meshmixer [INAUDIBLE] I'm wondering now is Meshmixer going to go away or something.

ALEX LOBOS: Yeah, that's a great question. That's the cool thing about Memento right now-- that I feel that it's gathering the best features from all of these different options. And it's making it very simple, because you can do all of that in one software.

AUDIENCE: [INAUDIBLE] it's not free like Meshmixer is, though.

ALEX LOBOS: Well, any Autodesk people in here who can answer that?

AUDIENCE: So the Meshmixer [INAUDIBLE] deal with bringing the Mesh file [INAUDIBLE].

AUDIENCE: Thank you, Alex.

ALEX LOBOS: Thank you. Thank you for coming.

AUDIENCE: The same Meshmixer tools [? are going to be ?] doing a preview of the Mesh work spaces.

AUDIENCE: But it's not going to have all the Meshmixer tools, correct?

AUDIENCE: As far as smashing together [INAUDIBLE], not yet, but so far right now what it has is [INAUDIBLE] cut sections, those kind of things.

AUDIENCE: Similar [? files. ?]

[? AUDIENCE: Similar files. ?]

AUDIENCE: So when you say not yet, does that imply Meshmixer is going to get [? phased out? ?]

AUDIENCE: Meshmixer is from a different side of the company. We're just taking that and [INAUDIBLE].

AUDIENCE: [INAUDIBLE] homogenizes, takes from everything.

AUDIENCE: Yes, we are the [INAUDIBLE].

[LAUGHTER]

AUDIENCE: [INAUDIBLE].

AUDIENCE: [INAUDIBLE] it's not [INAUDIBLE], correct?

AUDIENCE: [INAUDIBLE] I don't know.

AUDIENCE: If you look on the website, [INAUDIBLE].

AUDIENCE: I thought it was [INAUDIBLE].

ALEX LOBOS: Yeah, right now it's still available. It's a free download. The Mac version you actually need to send out an email, but they get to you right away. They send you a link to Dropbox, and then you can download the Mac version.

AUDIENCE: But mainly the-- I don't know [INAUDIBLE].

ALEX LOBOS: Bless you.

AUDIENCE: You can't just have as many photos as you want up there in the cloud being processed [INAUDIBLE] monetize that somehow based on [INAUDIBLE].

ALEX LOBOS: That might be it.

AUDIENCE: [INAUDIBLE].

ALEX LOBOS: Anything else? Yes? [INAUDIBLE].

AUDIENCE: Hi, Alex. So have you tried using this with your students yet as far as we've got young users [INAUDIBLE] of just copying and scanning something physically molded versus [INAUDIBLE] do complex sculpting and modeling on their own?

ALEX LOBOS: Right. Yeah, I mean part of this actually got started with some projects that we've been doing with Autodesk called hybrid fabrication. So the idea was to be able to transfer between digital and analog, and I showed this workflow to some students a couple of weeks ago. They loved it. For example, right now they're designing joysticks. Last semester they we're designing helmets, so they were talking about I can basically take Ron's head, bring it into CAD, and then I can do the best custom helmet that he has ever seen because he was there for reference. So yes, students really appreciate that, and they also commented on how they spend a lot of time with the clay models, but then they don't get to see a lot of those details with the traditional workflow once they start working in CAD. Well, thank you very much for coming. I really appreciate it. I'll be around the rest of the week.

[APPLAUSE]