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New repair master 3d guide

If your appliances have stopped working, your roof is leaking, your toilet won't wash off or your heater won't heat up, welcome to the joy of home ownership! Here you will find the fastest, clearest and most extreme tips for repairing DIY. And, if we don't have the best article or video to answer your need, we'll send you to the site that does. Just choose what you want to restore belowMaking garbage disposal stuck, clogged or leaked? This illustrated step-by-step guide offers expert tips for repairing it, including a few quick fixes. Read more... Read this expert advice on how to fix gutters and showers. Properly drain the water and do not add the structure of your home from moisture damage, maintaining gutters. Read more... Expert advice on how to repair damage to the wooden floor, repair of the wooden floor, repair of wood floor finishing, fixing scratches on wooden floors and much of the same... How repairs were last modified: September 8, 2020 By Don Vanderworth, HomeTips © 1997 to 2020 This guide is part of the series: Repairs using 3D printing. This series of guides describes the process of reproducing a broken part of a 3D printing viable substitute. Please refer to the main guide of the series to follow the full process. This guide provides a step-by-step explanation of a specific subprogram in the recovery process using 3D printing. For the first time, readers are encouraged to read the entire guide, experienced readers can use quick lists at every turn to guide and speed up their next attempts. Go to step 2 to get going! Is it important that the part is intact? If large parts are not enough, consider the possibility to restore them before scanning, for example, using clay. The missing geometry is very difficult to repair digitally. Make sure the part is not shiny, reflective, translucent/transparent, black or white. If so, try spraying it with matte paint or chalk. Are there critical, sharp edges or angles? 3D scanning causes rounded shapes. You can make changes to the resulting scanning model later. When you followed the decomposition guide and found that the part has mostly curved and organic shapes, you probably ended up here: a 3D scan part.3D the scan basically captures the geometry of the object, finding and measuring a large number of points on its surface. These points are represented in three-dimensional coordinates called vertices. When these vertices are connected, the triangular faces between them make up the surface of the grid, which is always an approximation of the source surface. The higher the density of the vertices (resolution) in the grid, the more accurate the model will be. Unfavorably, it takes more computer power and time to create a model. There are several 3D scanning methods. For this guide, we use a photogrammetry-based approach because it does not require a special Generally! In my graduation project, I learned this approach and found a proper workflow that leads to very self-important, consistent results in a relatively short time. Time. 3D scanning, as the name suggests, is based on photos to reproduce the 3D model from a physical object. Photographs of the object are taken from different angles, and the software clears geometry by matching thousands of control points in multiple photos. Thus, the software can work out the relative position of each camera (photo) to the object and perform a second dot matching operation to create a grid model. This guide describes my approach to photogrammetry-based 3D scanning; using one stationary camera (or smartphone!) to scan the broken part and prepare it for 3D printing. I will explain how to take good photos for scanning, how to customize your own (temporary) scanning scene and how to process the resulting 3D model. Success! This instruated uses the following tools: Digital Camera, DSLR or Smartphone Tripod, Mount, or any stationary support for the camera. [3D Smartphone Printing Clamp] Rotating Platform: My Own Designed 3D Printing Platform Orbiting Thingiverse! or, for example, IKEA SNUDDAA references for camera scaling and alignment: A4A FEATURELESS Background print guide: smooth wall, paper or fabric, preferably white multiple light sources: matte (diffuse) LED lamps or panels, studio lights or similar. I used ikea's brightest RYET 1000lm LED bulbs, in simple metal desktop lamps (like IKEA TERTIAL)Decent PC (Windows x64, Mac support unfortunately discontinued). Autodesk recommends at least a multi-core processor, 4GB of RAM and a discrete graphics card. Autodesk Remake, license for students, hobbies and startups is free! Download Remake and upgrade it to a free annual license. Matte paint or primer, fine powder spray or any other matting substance, in case your part is shiny, reflective, transparent, black or white. First, you obviously need a camera. It could be in theory any kind of digital camera. This includes a smartphone that in my experience has led to pretty good results. Overall, a better camera, however, gives better images if the camera is used with manual settings. Aside from image resolution, the advantage of a better camera in this case is when you have more control over exposure and image clarity, requiring you to be able to manually install the camera correctly. More on that later. However, naturally it is better to go for a DSLR or mirrorless camera, with full manual settings to have all the control over the resulting image, perhaps even with after processing raw afterwards. In addition, any camera mounted on automatic settings, including a smartphone, works well when the scan scene is set correctly. Select the camera you're used to if you have photo experience, go to camera settings manually. Finally, you need enough computer to process the scan. In this guide, we will use Autodesk Remake as processing software that can be downloaded for free for students, hobbies and Companies. You must create an account and install the software on your computer. (sorry, Autodesk has stopped supporting Mac users). We will use remake cloud processing because initial photo processing in the 3D model requires considerable processing power or takes a very long time. Thanks to remake remake servers, you will be able to automatically process the scan and get a detailed model in about 15-30 minutes! Typically, in professional photogrammetry-based scanning settings, an array of many cameras fire at once, creating a complete set of photos in a fraction of a second. Since most of us don't have access to dozens of cameras, we will simulate this installation with a single camera. Professional installation usually consists of several rings of cameras around the object in the center, equally dispersed and with different angles of height. This sphere of cameras can be reproduced by taking one shot at a time, moving the camera or object for each photo. The latter is our approach, installing a stationary camera and moving the object every time. To do this, a rotating platform is introduced. The object is located in the center and can be rotated in equal steps to take off a similar ring of photos as it will result from a professional installation. Make sure the object doesn't move on the platform! For example, fix it with a small piece of clay, nail or steel wire. Download my own rotating 3D print platform from Thingiverse! In your scene, preferably on your rotating platform, you'll need some kind of link that helps the software find checkpoints to align different camera positions. Because you will simulate different angles of the camera by rotating the object, the link should rotate along with the object. A simple page from the newspaper works perfectly as it has many wonderful visual details to use as landmarks! But I've created an alignment link tool that also includes scaling links, so you can also scale the resulting scan to the true size directly! Choose the orientation of the object wisely: try to make visible most of its geometry from a horizontal (camera) point of view. This means that looking at it from the side, as many surfaces, cavities, etc., and as little contact with the platform as possible should be detected. Also, try aligning the longest side of the object vertically, I'll explain why later. In addition, anything in the photos that don't rotate together should be pointless to avoid skewing the camera: a flat white background works best. Place settings in front of a white wall or use a large sheet of paper or fabric to create a sleek matte background behind a rotating platform. Then melt the camera in front of the scanning scene, on a tripod, mountain or any other stationary position. Try filling in the image frame with as much of the object as possible (with angle!), make sure that it is in the center of the frame. Lighting The next important aspect of the installation is to ensure good lighting conditions. Proper lighting exposes all the surfaces of the object in the pictures you are about to take. This is very important for the quality of scanning, since the geometry of the object should be readable software! The trick is to create Diffuse lighting, which means the light hitting the object comes from many angles and dissipates similarly to many directions. This kills any hard shadows, dark areas and glare that greatly affect the resulting 3D model! One option you have is to use daylight! On a cloudy day, the cloudy daylight outside is the perfect diffuse light source scattered by clouds. Just make sure your scene is outside as the light has to come from many angles, not just out of the window. Another option is to set up a tentative light studio. Using multiple light sources and scattering materials in front of them to disperse the light as much as possible, a diffuse installation can be created. Use multiple sources of the same kind, preferably matte LED lamps or panels, as they correspond to the color temperature, intensity and color spectrum. In my experience, IKEA's RYET LED lamp set of 1,000 lumens and simple table lamps to keep them running great! Send multiple sources to the object, but always away from the camera! Two lights on either side of the camera, as well as an extra top already provides a decent setting close to diffuse, as long as the source is already soft light (such as a matte light bulb or LED panel). Use a white background to bounce back the lights as well. You can try to diffuse the light even more using translucent materials such as matted plastic or chalk paper. Using bounce cards (white surfaces) to bounce lights in many directions also works. Many tutorials on DIY light tents and studios can be found online. I used ikea JÄLL's translucent plastic EVA laundry basket as a lightweight tent, with a hole to the camera and a piece of paper at the bottom. It's great as a small studio photography product as well! Experiment with lighting until you find a setting that works for you. This is again very important for the quality of the model and is worth getting right in front of. (If you want to go fast and dirty, I suggest going to the installation outside). Take a look at the included photos of the various scanning options that worked for me. Next, it's time to take a set of photos to be processed into a 3D model. The quality of these photos greatly affects the quality of the resulting model, as it is the only link for the software to create it. Throughout all my project attempts, I found many factors that affect the quality of the photo and found ways to form them for optimal customization. I will briefly discuss my findings to help you create consistent, catchy photos as well Three aspects of the photo determine the image quality for scanning: Exposure, Exposure, and resolutions. The latter is the only one that can't be influenced because it's limited to the camera you're using. Fortunately, most modern cameras, including many smartphones, photograph over 10 megapixels, which is more than enough for 3D scanning. The higher the better, of course, but with longer processing time in mind. I recommend you stick to 10Mp or higher, however my iPhone 5 (8Mp) also produced very mesa-fueled images. Exposition Aspect of exposure is perhaps the most important; all surfaces and features of the object must be clearly visible in the photos, in order for the software to use the data to reproduce the 3D model. This means that lighting conditions combined with camera settings should result in images without black or white (underexposed) areas, as well as proper overall exposure. Fortunately, almost all cameras from the 1960s are able to automatically set themselves up for proper exposure. But if you know how, manual settings prefer here to have more control over exposure. In addition, after processing the photo can help to correct the exposure settings afterwards. If you're familiar with a photo, manual settings help you take better photos. However, if you take a fast lane, a smartphone or automatic camera works just fine. I will not be in detail about manual settings here as it is a complete tutorial pictures by itself. Use what you are familiar with, the smartphone has worked well for me in many attempts. I used a Canon EOS 100D DSLR camera with a 50mm prime lens, and manually installed it on f/10, ISO400 and about 1/40 shutter speed. I set the focus and white balance manually, once and in front. SharpnessNot, the sharpness of the object in the scene is important for the result. In addition to normally focusing on an object, the Depth of Field effect can affect the overall sharpness of the object in the photo as we photograph relatively small objects. This effect results from a combination of the lens (diameter) and image sensor (area) used, creating a specific distance frame relative to the camera in which the subject is in focus. Anyone further or closer to the camera than in this area will be out of focus and therefore blurred or undoed sharpness. Fortunately, smartphones have a small sensor and a small lens, often with a very short focal pointing distance and thus not so much affect this effect as on a larger camera format. In this latter case, this effect decreases by narrowing the aperture by setting the camera to a higher aperture value manually. I installed the f/11 aperture in most cases. Check out a few pictures and judge the overall sharpness of the object. Look for blur in the edges and functions that are farther from the point you focused on. Taking photos Squeeze you are set to shoot good quality images, go ahead and start with the first. Adjust the camera so that it focuses on an object horizontally, fixed and with the correct settings. Settings. and rotate the platform 10 degrees. Be sure to use the remote shutter or shutter delay to avoid any movements of the camera! If you are working with a narrow aperture, shutter speed is likely to be long and the risk of blurring the motion of the camera image is obvious. For my DSLR setup, I usually shot with the 2-second delay option installed in the camera, or connected to Adobe Lightroom via USB to snap the capture directly to my laptop. For my iPhone, I used a smartphone clamp and tripod, and also turned on the headphone volume control to take photos without touching the phone. Count the photos you take to 36 for a full circle. If the geometry of an object requires this, take a few full circles of photos from different angles of height (after completing the previous full circle!), for example. top or bottom. Make sure the camera is reset for the next range of shots: refocus, check the settings, and fill in the frame after adjusting the camera position. Now that you've successfully created a good set of photos to be processed into a 3D model, it's time to let the software do magic. Import photos from your camera to a new project folder on your hard disk. Check and reject any errors, cancel or inconsistent photos, after processing them if you are able to. Then import the photoset into Autodesk Remake by creating a new 3D scan. Remake has several settings to configure under a free license, just select Cloud Processing and Local Image Settings and leave the rest of the default (High Quality). So cloud processing is free, and the results are generally good and work. Images will be uploaded to Remake servers. Depending on your Internet connection and image size and counting, it may take some time. Processing will start automatically after that, and you will receive an email after the model is complete. Leave Remake to make magic and go grab a cup of coffee! After processing: Remove model errors Squeeze your model ready, you can download it directly to Remake. Take a look at my raw scan embedded here. Wonderful! But don't let the texture of the image fool you, it's the 3D model we're after. Turn off textures in view settings and review the integrity of the model. If all is well, little without holes, false geometry and disarmament errors should be visible. If so, this is probably due to the invisible surfaces in any of the photographs, glare or dark areas I have warned you about. A failed scan of senseo's part is also included. However, another problem may be that some cameras have been reassessed. Press K and zoom out until you see blue pyramids representing cameras from your scene. If the cameras are aligned properly, you should see the perfect camera circles as it looks like you shot photos. If the cameras are re-drawn, mouse cursor to see which images could not be aligned, and try to reprocess without the image. If the problem persists, consider reusing the for example, a newspaper page on the platform to assist the software in finding checkpoints. Next, it is very important to scale the scan to the true size. Use measurable points on the original part, such as sharp corners or edges, or zoom links provided on the rotating platform that should be included in the scan. Select Set Zoom and select two points that can be measured and accurately specified in both the model and the original scene. It is advisable to use a link to zoom, integrated into the rotating platform. The scale is set by ensuring a linear distance between two points, as measured in the original scene.Additional model editing toolsFolkant tools in remake model can be cleaned and corrected fairly easily. Use the lasso selection tool to remove the face of the mesh, fill the holes with a nonfree hole, or automatically find defects in the model under Diagnostics. Do not have time to get used to these tools; cleaning the model saves a lot of time afterwards! Choice tools, such as choosing through the entire model, keep in mind that you don't accidentally remove parts at the back of the model. Instead, use the Isolation option that appears at the bottom. Cut off the scanning platform with the Slicing tool. Cut off any supports such as the clay at the bottom with the selection tools and try to fill the hole you just created. The Smooth or Flat options can be used in different situations. Experiment with Bridge Break to create a bridge between two or more faces on opposite sides of the hole if both options for filling holes create unwanted results. Finally, look for holes in the model that are not holes in the grid (with boundaries), but where the mesh lasts through the inside. Such holes are the result of glare or dark areas, and can be removed by removing the selections just around them, essentially creating two holes in the grid on either side. They can be filled with the hole filling tool and detected by the diagnostic tool. Run the final analysis to check if the model is fully defined and ready for the final step! Senseo part of the final scan tbeerkens on SketchfabSenseo part with errors tbeerkens on SketchfabIn this step you have theoretically printed 3D model. But in most cases it needs some additional changes to create a fully functioning scanning model. The exact diameters of the holes, the precise cut-off of the parting line, and other critical functions found in the decomposition step of this complete process may require additional attention to have a viable supersized model submitted to the printer. In this case, it is useful to import the model into the CAD modeling program. In particular, the Autodesk Fusion 360 is a very nice remake partner like this from one company. It's no coincidence that Remake has special options for Fusion 360. Once cleaned up as much as possible (and after checking for errors and scaling!), export your model for the Fusion 360 to . Object Object This will take some time as it re-processes the model to a square faceted grid. Importing this model into a Fusion 360 and converting it to a solid T-spline there leads to an edited, solid shape on which you can make sized changes similar to how you could do with modeling from scratch. Open a new project in Fusion 360 and import the newly saved quadrangle under Insert > Grid. Under Sculpt Options, find Convert and convert the imported grid to T-ridge. You can now go ahead and orient the scan to a convenient orientation in the simulation environment and start modeling on the changes. Cad modeling is described later in another guide to this series, see the next step. So far, we have created a 3D model from our original part using 3D scanning. This model is now theoretically printed and may already be useful for your case repair. Since the printed result is a plastic part, you can always reverse some flaws after printing, so it might be worth trying to print it out directly. Go to the next guide; Play to learn more about the printing steps in this process. If the model needs extra love and care before printing, such as additional details, size accuracy in some features, or simply redessing an entire lot, consider reading this series' CAD modeling guide because it includes a lot of useful information specifically for the purposes of repairing 3D models. 3 Playback guide

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