

Report for the 'Visual Effects and Animation' module

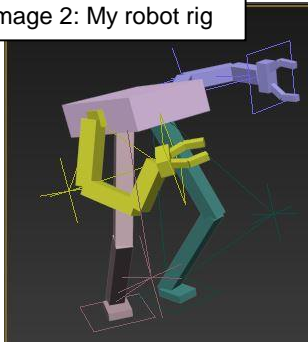
My idea for the visual effects shot is a robot which collects forgotten USB sticks automatically and brings them back to students when they log onto a university computer the next time. The main goal was to integrate the robot as well as possible into the real-world footage and then animate it, so it would move naturally and smooth. For implementing such a friendly robot, I wanted to use the handy CAT system integrated in 3dsMax which I'm taught in parallel by R. Fleming for the 3D Animation Project module. But first things first: A very important step for a structured workflow was getting the camera track done correctly. I used the standard 3D camera tracker integrated in AfterEffects and exported the camera data together with at least three nulls into 3dsMax. For this, I found a useful script on the internet, which didn't need a long time to discover. [\[Video for the Script\]](#)



Image 1: Adjusting the camera

The complete "tracking scene" needed to be rotated and moved, so the real-world plane, represented by a virtual plane which is defined by the averaged position of all nulls, would roughly match the ground plane in 3dsMax without destroying the relative positions of the objects of the tracking scene. It took some time to figure it out for all six scenes I've recorded, but it was definitely worth it! Because after doing this, one could place anything on the ground in the 3dsMax scene and it would look like it'd be actually in the scene.

Image 2: My robot rig



The greatest amount of work, however, was done when I created my own CAT rig and animated it. A quite complex scene, for example, was the robot pushing the door to get into the room: First, I had to create a simple box in 3dsMax to simulate the door and correct its position with several keyframes. Next, I made use of those handy IK controllers of CAT which I linked to the door, so the robot's hand would hold it perfectly during the critical moment. I also tried to animate the robot in a way one could see its effort while pushing the door, for it's quite small and the door is relatively thick and heavy. Fun fact: A nice fellow student from the animation course helped me with opening the door, concealed behind it... To see roughly how the robot will be placed, I rendered out a compressed version of the original footage and loaded it into 3dsMax as a background.

One last thing to set up was both the lighting and the rendering configuration. V-Ray did a really good job, I just had to place some additional plane lights by eye to simulate the bright light strips on the ceiling. Back again in AfterEffects, I combined the rendered animation with my original footage and adjusted the exposure of the CGI footage with the standard effect for every scene, so the robot would be lit consistently. I masked the robot out every time it needed to be behind a real-world object (like the elevator door in image 3), tracked the masks to the footage and did some further adjustments to integrate the robot even better. This included for example a little trick to get a correct-seeming reflection of the robot on a reflective part of the door which it stands in front of later in the sequence in which it's coming out of the elevator. It would've taken too much time to render out a correct reflection, so I used the existing footage of the robot, shifted and faded it, masked and tracked it to the door. If you don't know the trick, it looks actually like a proper reflection! Also, I've adjusted the robot's exposure while the elevator door is opening because the real-world camera did so, as well. To look right, the robot therefore needs to simulate this "slow adjustment of exposure", too. But finally, the compositions were ready to be composed!

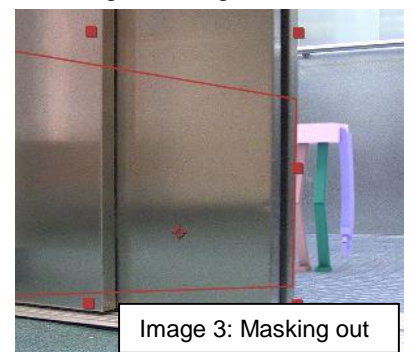


Image 3: Masking out

All this sounds very easy and quick to do, but I had to consider many things. Actually, it requested a lot of discipline and effort but now I'm really satisfied with my shots, even if I'd like to have the basic CAT rig replaced with a more detailed robot model. But I've so many other things to do! This has to wait until my next holidays... But except from that, I did everything for the shot I planned to do. In every case, I learned very much about a structured workflow and commonly used software. It was always very motivating to dig in some of the exciting professional methods for doing visual effects! In general, I'm also very interested in this topic in private.