



Developing world class talent

VFX Assets for Students

By Andrew Daffy, The House of Curves

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Section 1 – Introduction

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Introduction from Creative Skillset

Section 1 – INT02 – v1

Welcome to the *VFX Assets for Students!*

The VFX industry in the UK has a world beating reputation, and is an industry that continues to grow. To maintain this international reputation and support growth, we need make sure we develop the next generation of talented individuals here in the UK.

VFX Assets for Students is a complete system of exercises and industry standard assets designed to help teach VFX skills to students and new entrants across the UK.

This resource is part of Creative Skillset's wider VFX skills initiatives that respond directly to the Hope/Livingstone *Next Gen* review's twenty recommendations for the Visual Effects Industry. Supported through Creative Skillset's UK film skills strategy *A Bigger Future 2*, the VFX training programme aims to close the current skills gaps and shortages (which have led to high levels of overseas recruitment) by boosting the skills and international reputation of UK graduates entering the VFX industry.

VFX Assets for Students has been developed through feedback from tutors on Creative Skillset accredited courses and at our academies, who found it difficult to teach VFX without industry standard assets. Since VFX companies do not own the stunning images and assets they use in their work, it was necessary to create our own for both universities and industry to use when training new entrants in VFX.

Creative Skillset has collaborated with Andrew Daffy, former head of 3D Commercials at Framestore and now director of the House of Curves, to create these assets for students. Andrew worked with Teesside University students to start developing the right assets that could be given to any university so they could start to engage with VFX teaching. He then went on to produce a phenomenal resource that includes over 90Gb of exercises and assets including HDRI plates, complex rigs, normal maps, texture grids, a variety of background plates, a range of Greenscreen, mattes and rotos to name but a few.

In addition to producing the assets, Andrew has written this accompanying document. As such the personal opinions and views expressed in this document are those of the author and do not reflect those of Creative Skillset.

VFX Assets for Students is an evolving resource, and we hope students, tutors and VFX professionals will contribute and share in a spirit of collaboration and enrichment.

We would particularly like to thank Andrew and The House of Curves for all their work.

For more information about our work with the VFX industry and to download our *Core Skills of VFX* handbook go to www.creativeskillset.org/vfx

Foreword by Shelley Page

Section 1 – INT03 – v1

As a long-term advocate of practice-based curriculums I am delighted to be associated with this exciting new project which I am certain will become a really valuable resource for present and future students interested in entering the animation, games and VFX industries.

In my experience, the most successful academic courses in this area are those which are fully engaging with industry professionals to ensure that the courses delivered are relevant to both current and future developments in the professional sectors the students are aiming to enter.

Andrew Daffy's considerable experience as an award-winning VFX supervisor on many memorable TV commercials, feature films and other high-profile VFX projects has inspired him to develop this unique project which will benefit not only the initial participants but those who will build on and develop the archive for the benefit of future students.

This practice-orientated digital asset archive project will enable the participants to experience first-hand a range of technical challenges as well as encouraging individual artistic expression.

Working on this exceptional project as part of a team will encourage each participant to develop the type of transferable skills and abilities needed to succeed in a fulfilling career in this constantly evolving industry.

Shelley Page
Head of International Outreach
DreamWorks Animation



Preface by Andrew Daffy

Section 1 – INT04 – v01

I've been a fan of VFX from a young age. *Clash of the Titans* and *Flash Gordon* got me wanting to do mini creations of my own. Building animations for GCSEs and A Levels led to me think that a degree course would be the obvious next step.

Whilst wandering around the various UK universities in 1995 I quickly realised that none of what was on offer could meet my requirements. After sending out a few letters it seemed that companies such as The Mill and MPC insisted that a good reel was more important than a piece of paper. So looking for the course where I could be most 'hands on', I travelled to Vancouver and did an eight month intensive course at CDIS (Center for Digital Imaging and Sound), which thankfully led to a junior position at Framestore.

It turned out that I was amongst people who are now masters of the trade. I was very lucky to have so many great mentors around me, and when they dispersed around the globe, they left me as a twenty five year old to lead the commercial department.

I now run my own company The House of Curves which facilitates all of my interests in live visuals, pop promos, as well as lecturing and teaching at conferences and educational establishments worldwide.

Within the education sector, I've mostly enjoyed my time doing short VFX workshops at Filmakademie in Baden-Wurttemberg, Germany. As well as this I did project supervision for the students in which my task was watching films at various stages of completion and offering suggestions for improvements. Teaching at The Animation Workshop in Viborg, Denmark and marking the work of the students at Supinfocom in Arles, France were equally thrilling, and lastly, I've been on juries for various award ceremonies. It's given me a trained eye for what's going on in education around the globe.

My secondary school asked me to return to deliver a talk about my career. In thinking about what I might say I feel like I've come full circle, with my own business and experience as an educator, I receive letters asking my advice from other budding animators. I've therefore been asking the question: If I was graduating high school now, would I still think going abroad would be a better option for me? It's a hard one to answer, because although the universities have obviously improved, and there are some exceptional students graduating, the competition is far greater to get the really juicy jobs in the industry.

Based on my interest in this area, The House of Curves released a poster/PDF called *Tips for Students* (available in folder 98_EXT02). It's been massively popular and it thankfully lives on the walls of most institutions teaching animation today. However I feel my studio and I can help to go one step further in helping build a university course that I would jump at the chance of attending. Which is why we've teamed up with Creative Skillset to build *VFX Assets for Students*.

CGI vs. VFX

It strikes me that in the UK our showreels might be missing a trick.

When I think about CGI animated films, the names Pixar, DreamWorks, Sony Imageworks and other studios spring to mind. Location-wise I think of Hollywood, San Francisco, Sydney and some new serious upstarts in Vancouver, Bollywood and beyond.

The UK has attempted many times to make an animated hit, but apart from Aardman there are no major CGI studios in the UK making purely animated films in any sustained capacity. Sadly, the occasional Aardman feature cannot employ the sheer volume of animation graduates coming out of the courses in the UK year on year, and skills required for their company may need to be more in the 'traditional' territory of 2D and stop motion principles. It feels like there's something amiss that means we struggle to put our stamp on this type of work, no matter how hard we try.

However, on a world scale it seems that VFX is an area we thrive in. Framestore, Double Negative, Cinesite, The Moving Picture Company, The Mill, Studio AKA, Passion Pictures down to the 'boutique' houses (like us!) are on a daily basis delivering movie, TV, pop promo, internet viral and commercial work which is admired the world over. Some people put it down to having a long history of producing sophisticated commercials compared to the USA, and the focus of production being within the concentrated square mile in Soho that calls for animators, composers and producers to be at the top of their game and to work with tough directors within the very strict time parameters set by the client. Creating VFX for films is not much of a leap forward from this process, especially since the HD revolution.

Why then with such a UK prominence in VFX, are courses that teach CGI principles encouraging work in a pure animated CGI form? It's famously difficult for companies in the states to employ people from overseas, so even if a company wanted a British student, it wouldn't necessarily happen until they got some years behind them on home turf. I therefore think more attention needs to be given to learning and teaching VFX principles.

Why VFX Assets?

Creative Skillset have compiled a wonderful PDF handbook called *The Core Skills of VFX*, which can be downloaded from www.skillset.org/VFX. The content was developed from lots of roundtable discussions with members of the industry, including myself, where we discussed every topic from the beginnings of production such as concept drawing and modelling, to the finishing touches in lighting and compositing. We wrote down all the facets of each subject, then summarised what key areas should be part of an idealised curriculum within universities.

A common discussion was that lecturers and students had a lack of fundamental assets such as learning tools, guides, footage, checklists, rigs and examples of industry standard practices at their disposal. With an infinite array of demos on YouTube often of dubious provenance and authority, it's sometimes hard to get the right advice about the best way to do a certain thing. I'd often pipe up in the roundtable conversations and say 'so let's make some demos! Give away some footage and document some good practices'. This always got a very enthusiastic response, but with the time pressures of delivering film, TV, game and commercial projects people just don't have the time to allow such an undertaking. Also, larger companies don't own the images they work with, so can't simply donate them. I however run a very small company and have wanted to do this for a very long time.

Another thing is that production rigs and models are so often sensitive and restricted to the company producing the work. Non-disclosure agreements have been signed so a lot of secrets remain within. I'm of the personal opinion that most of the secrets heavily guarded in the early days of CGI (or at least when Soho became a serious contender for Hollywood)

have been diluted by so many employees moving from company to company, and information naturally being shared. Rigs, modelling techniques, render passes, production schedules, to name but a few Industry practice is very much standardised now so students should get these tools from day one of their studies and get cracking. Taking rigging as an example, I was always of the mind that you can't hide bad animation behind a good rig, but you can try to excuse bad animation with a bad rig. A good rig in a mainstream studio may take many months to develop and build by lots of technical people, but that doesn't normally make it over-complicated, slow and hard to use. It should be a joy. It should facilitate pure creativity. In my experience, the pleasure of giving someone a rig I've built that they love to use and start coming up with great poses off the bat is immeasurable. Imagine the fun work that would come from a university that had been permitted to load up and use a character like Buzz Lightyear rigged the PIXAR way, things would change overnight.

People are often comparing the UK higher education system and graduation films with those from the European Schools such as Filmakademie, Les Gobelins and Supinfocom. The work that comes from these institutions is often exemplary and gets seen the world over in award ceremonies, festivals and virally. Because there are so many radical differences in the curriculum and principles of teaching across the shores, I feel it's an unfair comparison to make. However there are things that they do that we can learn from. One of these vital categories is 'Previous Assets'.

Year on year, the European schools improve. The group project structure means that a lot of information is shared and a lot of time-wasting mistakes have already been learned from previous projects. Renderfarms get tested, shaders get developed, sound facilities/techniques improve and the work gets slicker just by having a solid foundation of historical assets to work from. Students from earlier years help on the senior projects and get insights into how good quality scenes are put together. Things like the settings that make for a good soft shadow, how to composite passes in an effective way, keeping scenes clean and how to edit a previz sequence and turn it into a final animation. These nuggets of information which I'm calling 'assets' are what help guide the future years to come.

Bridging together my thoughts about teaching VFX, my involvement in the roundtable discussions and witnessing the way the Europeans seem to continuously improve, led to a light bulb going off in my head and I approached Creative Skillset with an idea: that I spent some time in the UK with students and lecturers and we build some assets to share amongst the universities of the UK.



In addition I would run workshops, publish what we film and back the work up with some context in the form of example scenes, exercises and a supplement PDF. Maybe an open resource such as this can go towards helping instigate some amazing pieces of work to be made, to start building a new wave of high quality courses at a top flight European level.

Thankfully, Creative Skillset said yes and here we are.

Teesside University Workshop, 2011

Assets file and folder structure

Section 2 – INT08 – v01

I've organised all of the demos, documents, plates and exercises into specifically named folders. Above this level I've tried to group the assets into larger subcategories such as 'greenscreen' and 'backplates' which evolved naturally through doing the first workshop, and by seeing what emerged from gathering my extra elements together.

I wanted to try and make a system that could remain a 'work in progress' that I can continually add to and improve, that can grow over time and that I could continue to manage after the first launch of the *VFX Assets for Students*.

Folders

The folders follow this convention: *05_GRS04_v1_bar_scene/*

Term	Meaning
05_GRS	Relates to the subcategory. In this case GRS or Greenscreen. The number upfront orders the categories with important docs upfront (00_) and extra, miscellaneous docs at the end (99_).
04_	Relates to the subcategory. In this case GRS or Greenscreen. The number upfront orders the categories with important docs upfront (00_) and extra, miscellaneous docs at the end (99_).
v1_	I may from time to time improve certain folders. I may add more examples or include previous students' attempts at working with the plates. I've versioned the folders so that as an institution you can keep your copy of the Assets up to date by tallying your version numbers with the latest list, without having to constantly download the entire series.
bar_scene/	Relates to the name of the exercise.

Files

Within each folder are the files for the exercise, plates or demo. The names of the files follow a similar convention to the folders, but without the version numbers and they also contain specific information about the plate, document, etc.

File Ending	Meaning
_ref	They are not for use within reels, they are owned by studios who've graciously allowed me to present the work for reference purposes.
_preview	Small playable versions of the larger uncompressed clips.
_still	Thumbnail pngs or jpgs of the elements, used to help visualise the contents of the folder.
_cover	Thumbnail pngs or jpgs used to summarise each folder visually.

Guidance for usage

Section 1 – INT09 – v1

Crediting the work

At the time of writing this, most of the assets were made via a workshop that I ran at Teesside University. As I tour the UK this will grow and diversify. If you decide to use the clips we'd appreciate you give some mention of the parties involved in putting the work together. The institution/guest artist who worked on a specific clip is mentioned within the cropping area. Care must be taken to avoid making it appear within showreels that the part of the work using the *VFX Assets for Students* was produced by the student (using it in their reel).

To try to find a way to communicate that parts of reels use the assets. This not only gives fair dues to those who put this together, it presents a good personal challenge to learn how to visually communicate a collaborated project and ultimately it gives potential employees an insight into how forthcoming someone may be about crediting teamwork.

Building blocks

As much as I want to encourage that students freely use these these assets, I think that the footage should form a foundation to better things. I consider the clips, the render scenes and the guides to be building blocks. When I joined Framestore, I had immediate access to libraries of work, directors went out and shot the clips, and knowledge was freely available. My skillset transformed overnight because of this incredible access. However, I left my mark when I started adding my own flair to the projects; I developed my own techniques for production, started favouring creature animation, named files in my own way and brought previsualisation into the commercial pipeline. I could only have extrapolated my skills this way because of the solidity of the resources, so I'm hoping these assets serve as a similar resource from which to build. But in terms of the clips on offer, I personally encourage students to think beyond them, improve on them, and to transcend the assets to make the final works they consider very much their own.

Getting others to see your work

If you want others to see how you've used the plates, or worked the exercises, upload your clips to Vimeo or YouTube with the suffix "VFX Assets for Students - ...". Then at least we'll have a fighting chance to see what comes of this venture.

Quality control

The original concept for the *VFX Assets for Students* was to get guest artists/directors to supply background clips that never made it into commercials, pop promos or films. On reflection, we felt that we should try to make the resource more approachable, to enable the students looking at the exercises to know 'well... I can shoot that, and I can shoot it better!'. So the idea is to film as much of the work as possible with actual students with the facilities available at the campuses.

This introduces all manner of challenges. The cameras available are on the whole High Definition, but the compression rates are often very high. Tripods are a bit worn and shaky. There are no focus pullers, each camera has its own quirks so during workshops along with the students, I'm forever trying to find out how to turn off auto focus, auto exposure, post sharpen, all the things that camera manufacturers have turned on as default but tend to ruin shots for actual production.

The clips available by in large were made under these limitations.

The idea of having guest artists supply work hasn't gone away. My old mentor has supplied some time-lapse material, and I'm finding some unused bits from shoots I've been part of.

Software

Section 1 – INT10 – v1

Most of the background plates, textures and renders can be brought into any piece of professional software. However some of my exercises and scenes rely on some or all of the software listed below.

In an ideal world, as well as having Maya files, I'd have duplicates in other useful formats. The assets might go this way eventually, but for now I'm confident that the software required to get the most out of what I've prepared is pretty standard and recognised in the industry.

Software	Notes
Maya	All scenes will load into Maya 2011 or upwards. Some scenes will load into earlier versions, but with no guarantees of their reliability.
Photoshop	Pretty much any version can be used. The 'merge-to-HDR' is required for my VFX run-through (section 08_VFX01), and the more recent the version you have, the more manipulation you'll be able to do with 32 bit images.
After Effects	I like After Effects over other solutions, because as well as having the ability to composite, it can be used to keep an edit, export frames easily and put a showreel together. It has an amazing stabilization tool integrated into CS5.5 called 'warp stabiliser' which should certainly be used on some of the raw plates supplied in the background plates section (07_BPL).
Nuke	Some universities have been lucky to get Nuke licences through Creative Skillset funding, and some have invested in what is now the industry standard for the film VFX industry. Whilst you don't need it for these assets, courses should be looking to work with this software eventually.
ReelSmart Motion Blur - for After Effects	For speed, efficiency and often quality reasons, I very often don't process motion blur as part of my renders. This software allows three levels of control, all of which enable either accurate blur where it's possible (3d renders on solid objects), or cleverly approximated blur on footage that isn't (footage shot on high shutter speed).
Twixtor - for After Effects	Made by the same company, Twixtor enables retiming of shots. Shots can be slowed to a crawl, converted from 30fps to 25fps to film (24fps), timeramped, and time-lapsed. . Depending on the nature of the footage, it can give an amazing result that doesn't look at all visually effected.
Frishluft Lenscare - for After Effects	This is my favourite tool for good looking and controllable Depth of Field. (Passes in Maya to show this working are available in 03_3DA03)
HDR Shop	At time of print v1.0 of this software is free and available from http://www.hdrshop.com . It's a great tool for warping chrome ball images into Panoramic Longitude and Latitude images, for use in 3D.

Reel and logos

Section 1 – INT11 – v1

Reels

In this folder you'll find an edited compilation reel of the assets rendered at a very low resolution to flick through, so that all of the footage created to date can be seen easily and quickly.

Logos

The logos used for the documentation are also available here as well as a version with an alpha channel embedded, in case students want to burn this into their work.

Section 2 – Organisation

Folder structure

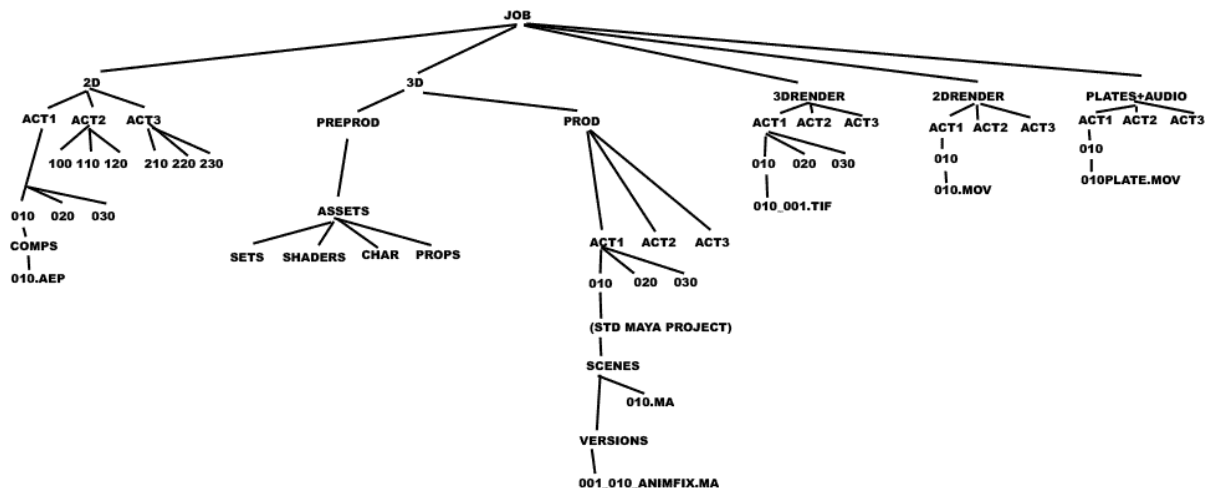
Section 2 – ORG01 – v1

This section discusses the importance of having a system to facilitate your ideas and your projects, to enable you to never lose work and allow others to know where and how you are working.

I'll be documenting how we organise our folders from job to job at The House of Curves, and how I've seen them organised in other facilities. A university may decide to come up with a system for all to use, something which reflects that of a post house. Or individual students may decide to have their own convention. Either way in the next version of the assets upload, this section will show how paying attention to such detail now pays off later. Creating asset libraries of your own builds your strengths from one job to the next.

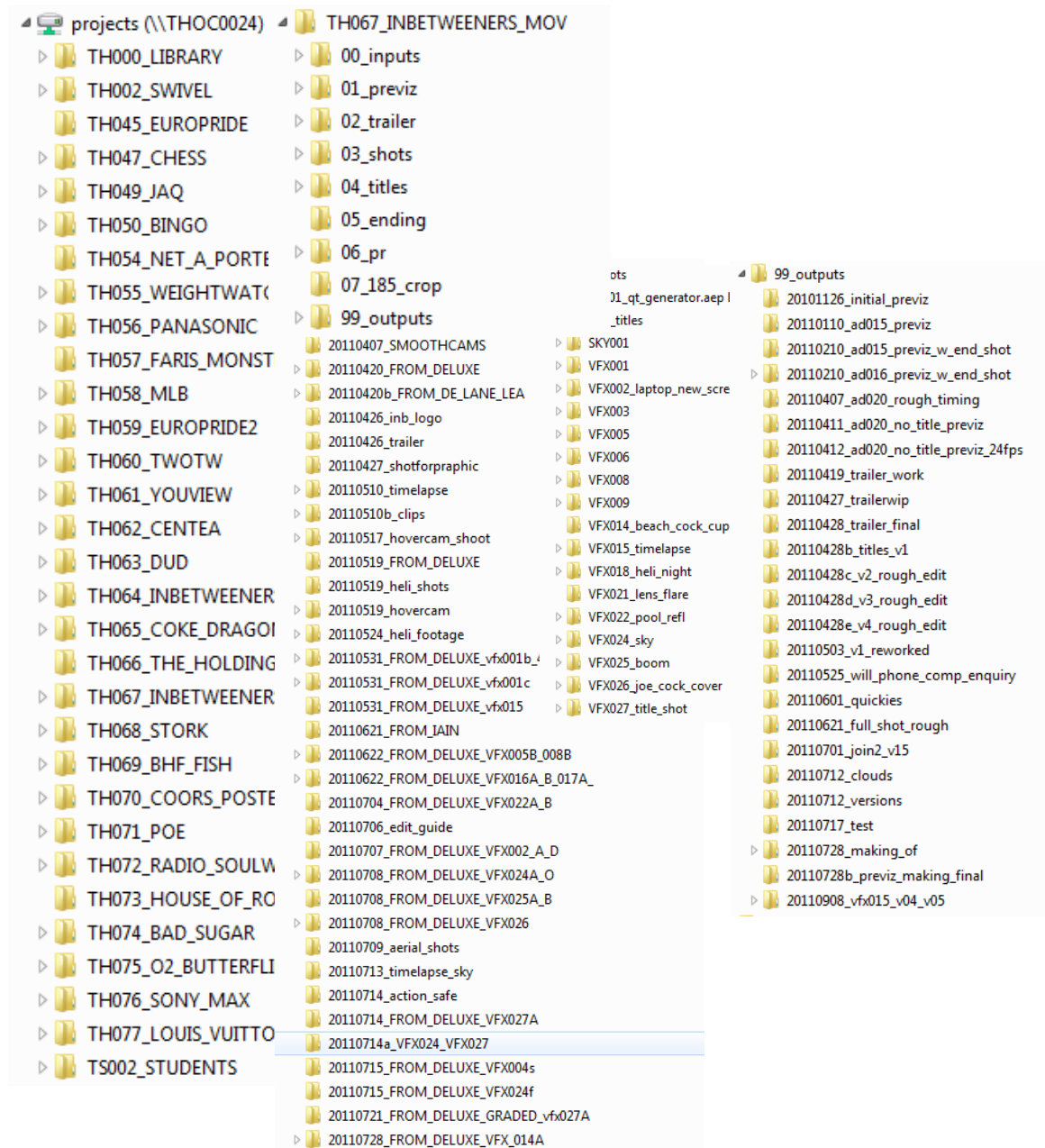
In the meantime, I've included in the folder a rough plan that I helped with in the early days of Framestore. It was made when Flames and Infernos were being introduced. As opposed to laying off 3D work to tape or playing it live into the Henry suites, compositing systems were becoming part of the same networks as the ones used in production and 3D. Therefore channels of communication became easier overnight, but also had the potential to be very confusing.

Therefore this is an early tree diagram to show what folders we might need and where on a given job.



tHoC Folder Structure

Although I don't have the tree diagram for our studio, you can see how every job gets a unique number, we keep it all looking consistent and the library is listed upfront to find it easily. Within the job, we have a 00_inputs, a 99_outputs for any piece of work arriving into or leaving the studio, and then as we work each new folder is numbered chronologically. In inputs, folders are created to house the assets and we use a reversed date system so that alphabetically the list is always neat.



Naming conventions

Section 2 – ORG02 – v1

As well as the locations of files being important, the names of the files themselves can be crucial. Here's a snapshot from the scene folder of one of our biggest shots on *The Inbetweeners Movie*.

ad003.bpj	5/16/2011 2:52 PM	boujou project fi
ad003_JOIN2.ma	5/16/2011 2:52 PM	Maya ASCII File
ad004_JOIN2.ma	5/16/2011 2:58 PM	Maya ASCII File
ad011_JOIN2_smoothed.ma	5/20/2011 6:06 AM	Maya ASCII File
ad012_JOIN2_smoothed.ma	5/20/2011 7:03 AM	Maya ASCII File
ad014_JOIN2_smoothed.ma	5/20/2011 9:29 AM	Maya ASCII File
ad015_JOIN2_better_cam_approach.ma	5/20/2011 12:39 PM	Maya ASCII File
ad016_JOIN2_better_cam_approach.ma	5/30/2011 6:09 AM	Maya ASCII File
ad017_texture.ma	5/30/2011 5:49 AM	Maya ASCII File
ad017_texture_EXP.ma	5/30/2011 5:50 AM	Maya ASCII File
ad018.ma	5/30/2011 6:13 AM	Maya ASCII File
ad018_texture.ma	5/30/2011 6:09 AM	Maya ASCII File
ad030_JOIN2_projection.ma	6/21/2011 2:08 PM	Maya ASCII File
ad040_JOIN2_render_passes.ma	6/25/2011 1:15 PM	Maya ASCII File
ad041_JOIN2_render_passes.ma	6/27/2011 9:43 AM	Maya ASCII File
ad044_JOIN2_new_cam_7_frames_shorter.ma	6/27/2011 9:45 AM	Maya ASCII File
ad045_JOIN2_new_cam_7_frames_shorter_EXP.ma	6/27/2011 9:45 AM	Maya ASCII File
ad047_JOIN2_new_window.ma	6/27/2011 1:29 PM	Maya ASCII File
ad050_JOIN2_extra_buildings_fence_for_MIKKEL_SPHERES.ma	6/27/2011 3:23 PM	Maya ASCII File
ad063_JOIN2_depth.ma	7/17/2011 6:20 AM	Maya ASCII File
dp005_JOIN2_house_build.ma	5/17/2011 3:46 AM	Maya ASCII File
dp006_JOIN2_house_build.ma	5/17/2011 5:09 AM	Maya ASCII File
dp007_JOIN2_jays_window.ma	5/17/2011 5:34 AM	Maya ASCII File
dp008_JOIN2_con_before_camera_move.ma	5/17/2011 7:41 AM	Maya ASCII File
dp008_JOIN2_tighter_geom.ma	5/17/2011 10:42 AM	Maya ASCII File
dp009_JOIN2_window.ma	5/18/2011 3:54 AM	Maya ASCII File
dp010_lays_house_exp.mb	5/20/2011 9:55 AM	Maya Binary File
dp010_JOIN2_uv_geom.ma	5/19/2011 10:09 AM	Maya ASCII File
dp010_JOIN2_window.ma	5/18/2011 10:46 AM	Maya ASCII File
dp015_lays_window_exp.mb	5/23/2011 3:09 AM	Maya Binary File
dp015_JOIN2_behind_window.ma	5/23/2011 3:09 AM	Maya ASCII File
dp021_JOIN2_curtain_detail.ma	5/24/2011 5:41 AM	Maya ASCII File
dp022_back_windows.mb	6/22/2011 3:02 AM	Maya Binary File
dp022_JOIN2_curtain_to_strait_DAFFY_APPROVED.ma	5/24/2011 8:57 AM	Maya ASCII File
dp034_JOIN2_projection.ma	6/23/2011 5:13 AM	Maya ASCII File
dp35_render_passes.ma	7/1/2011 11:18 AM	Maya ASCII File
dp36_render_passes.ma	6/23/2011 7:14 AM	Maya ASCII File
dp43_join2_render_passes.ma	6/27/2011 8:29 AM	Maya ASCII File
dp46_join2_projections.ma	6/27/2011 9:49 AM	Maya ASCII File
dp48_join2_projections.ma	6/27/2011 1:46 PM	Maya ASCII File
dp49_join2_projections.ma	6/27/2011 2:07 PM	Maya ASCII File
dp051_JOIN2_tracking_passes.ma	6/28/2011 7:56 AM	Maya ASCII File
dp052_JOIN2_tracking_passes.ma	6/28/2011 9:52 AM	Maya ASCII File
dp053_JOIN2_tue.ma	6/29/2011 5:34 AM	Maya ASCII File
dp054_JOIN2_wed.ma	6/29/2011 2:50 PM	Maya ASCII File
dp055_JOIN2_wed.ma	6/29/2011 4:39 PM	Maya ASCII File
dp056_JOIN2_thu.ma	7/1/2011 4:58 AM	Maya ASCII File
dp057_JOIN2_fri.ma	7/1/2011 10:59 AM	Maya ASCII File
dp058_JOIN2_fri.ma	7/7/2011 7:25 AM	Maya ASCII File
dp061_JOIN2_extras.ma	7/11/2011 9:23 AM	Maya ASCII File
dp062_JOIN2_depth.ma	7/11/2011 9:31 AM	Maya ASCII File
dp064_JOIN2_render_TO_MIKKEL.ma	7/11/2011 10:18 AM	Maya ASCII File
dp065_JOIN2_render.ma	7/20/2011 4:21 AM	Maya ASCII File
dp065_JOIN2_render_bad_pre_delete.ma	7/18/2011 1:10 PM	Maya ASCII File
dp065_JOIN2_render_rest.ma	7/27/2011 3:23 AM	Maya ASCII File
dp066_wireframe FOR SHOW AND TELL.ma	7/27/2011 3:29 AM	Maya ASCII File

Useful practices

The system I use isn't representative of everyone's system, but I've noticed that some VFX houses use a similar type of organisation. Framestore, like other large companies, have since adopted a new pipeline which is very efficient and works throughout the company/departments but is perhaps overkill for smaller productions.

Also, like all systems mine contains the odd flaw in its logic when it comes to specific scenarios, but it does follow some basic rules that I would recommend adopting whatever your chosen convention.

Save often

With the gigabytes and terabytes of space available nowadays, it's important to realise that saving often is more important than losing everything.

Increment versions consistently

More or less with every save, increment the version number. I seldom save over something.

Use an 'ID'

Try incorporating your name somewhere in your filename, and get others working on your project to do the same. That way, anyone can see at a glance, who has worked on what.

Be descriptive

In a few words describe the changes made to your scene. Unless it's minutiae, which doesn't need logging. From my folders someone can read the history of a shots development from the filenames. Never very long descriptions, but useful at 4am when trying to unpick someone else's workings.

Use underscores not spaces

In anything you do on the computer, be in a habit of using _s (underscores) in your filenames. That way, Mel scripts, Render Farms, Macs, PCs, Linux will all see and read your file the same way. So, House_of_curves.jpg, not House of curves.jpg for instance

Use padding in your versioning

Not crucial, just neater and easier to read off the page. Instead of v1, consider v01 or v001.

Note big changes, meetings or approvals

When a client, a team or a tutor has approved or seen work, save the scene in CAPS or something bold that stands out. _AGENCY_APPROVED... _TEAM_DISCUSSED... etc.

Call your render images the same as that of your scenes

It's normally an automatic function. But for example in the playblast, Maya doesn't continue to update the image filenames as you save your scenes with new names.

Have subfolders in your images folder

Your images (render) folder can get congested very quickly, you can be waiting minutes whilst browsing around folders, just for them to update the 1000s of images in there. In playblast, if my scene is ad004_blah.mb I'd write ad004/ad004 in the filename area. This automatically creates a new folder, easy to track versioning and not so much typing each time you want a flipbook.

Previsualisation

Section 2 – ORG03 – v1



Illustrations courtesy of John Taylor as part of his 'guess the movie poster' quiz for SHORTLIST. See more at www.filmtheblanks.com

Can you guess the film posters from the blocky versions shown above? Its amazing how little detail is needed to communicate special awareness, recognisability, perspective and camera angles. (The answers are at the end of this chapter).

So with this in mind, imagine watching your favourite movie in a much simpler blocky CGI form. The camera moves are still cinematic and exciting, lighting is basic but representative and the guide soundtrack is close to final. But the complex actions, the modelling detail and detailed textures have been stripped down to very basic motions applied to primitive shapes.

Consider The Statue of Liberty half sunken into the sand in *Planet of the Apes* but represented by a bunch of cones and cubes.

... a sphere replaces the boulder chasing a low poly 'Indy' down the narrow cavern.

... the young 'Incredible' Dash is a mere cylinder gliding over a grid mesh avoiding 6 sided polygon disks instead of a complex CG figure skimming the simulated and reflective ocean avoiding shiny, and sharp spinning blades.

... imagine the signature motion of the Millennium Falcon rising and turning from the enormous cave/mouth perfected via key frames with a squished sphere emerging from a torus.

... envisage 2001's black monolith during the Dawn of Man sequence is one large stretched cube... Oh, hang on!

It will be the case in all of these examples that the narrative and the actions still read very clearly. By and large, for all CGI films that get made and the complex VFX sequences you see unfolding on the screen, the stories and actions are planned, timed and represented in this very basic form and as a crucial step beyond the storyboard. It's called previsualisation or previz (or 'Layout' in the case of CGI films).

Because of its basic nature, it's really fast and easy to try things out that normally would take either weeks to animate, or lots of money to shoot. Directors can see rough versions of their potential film sets from a range of angles before hiring expensive bits of kit. Producers can look at a previz and break down what needs modelling, animating, building, how to group shots for each day of a shoot, and how to schedule a production. Character riggers can assess what types of things a character might need to do. Whole teams can watch a previsualisation and have healthy debate about the best tool to achieve the actual job. Students can build a previz of their own to assess all of these things before embarking on the mountainous mission of making their own film for real. They get the added plus that they are a very rare and welcome part of a showreel.

Previz in production

Framestore - *Chrysler*

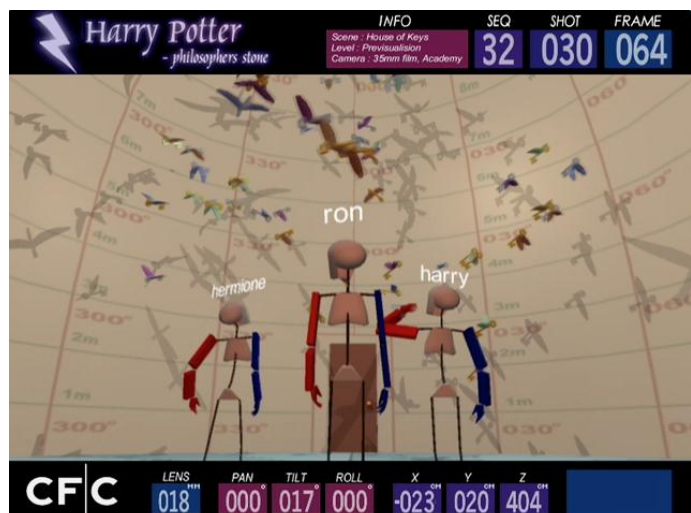
My first really adventurous advert was done at Framestore and was called *Chrysler Golden Gate* for director Daniel Kleinman. He wanted cameras flying around the Golden Gate Bridge in San Francisco as it was being pulled into odd shapes by a series of tugboats to eventually form a race track for the Chrysler cars to traverse.



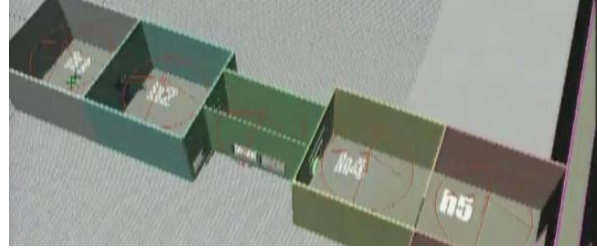
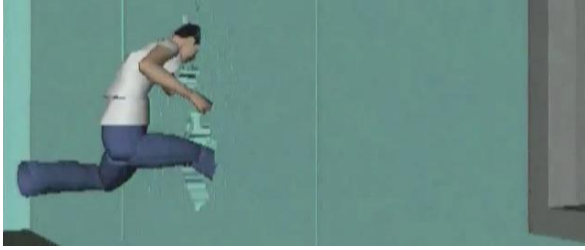
This was obviously going to be an expensive shoot, a limited timeframe to get the shots and quite an ambitious task to shoot in a helicopter a real bridge without the many bends within it. We therefore built a very basic version of the bridge in 3D, to the scale of the real one, and started moving virtual cameras around it. Daniel loved that he could see certain angles not possible with storyboards and that all the work we did inherited a high degree of accuracy in that we could tell him which lens we'd used, how low we were and even give him a GPS location for the helicopter pilot.

Framestore - *Harry Potter* pitch

I then coordinated a previz to aid Framestore's pitch for the VFX on the *Harry Potter* series. You can see here how much detail went into it including some attempt at character animation. In most cases this would be considered overkill, but I wanted to show how the three hero characters might mount their individual brooms. Amazingly I ended up creating the previz for the Hippogriff sequence in *The Prisoner of Azkaban*.



Framestore - Levi's *Odyssey*



For Levi's *Odyssey*, we combined previz with physical R&D rehearsals with the actors in the real world to ascertain a good hurdling distance between the walls that the couple run through within the ad.

To sell the concept of a long distance travelled within one large block of flats, director Jonathan Glazer wanted one continuous shot showing the actor running through a succession of walls. To avoid the whole thing feeling like a camera running through a set for *Neighbours* we spent a long time in previz devising little window hatches and outdoor vents. All of our measurements were used on set for the real shot.

Glassworks and Finish TV - British Airways *Ease*

British Airways *Ease* called for my most accurate previz to date. Every prop I made in 3D had to be made for real, every wall built, and sections of real aircraft were brought into the sound stage for the multi-million pound construction and shoot. The camera move was made up of five independent moves within the same set in various states of dress, shot using motion control where the camera was mounted on an enormous 'Milo' rig, a robotic arm on a track, computer programmed to re-enact the motion I'd developed in the computer. Any false information and the entire ad would have fallen flat. It was on this job that my first eye twitch started.



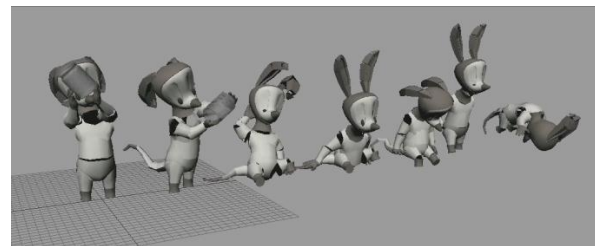
A more detailed breakdown can be found here...

<https://vimeo.com/31352411>

Studio AKA's *Varmints*

Our longest and most narrative based previsualisation was for *Varmints*, a 24 minute short film adapted and directed by Marc Craste and produced by Sue Goffe at Studio AKA. 'Varmints tells the story of one small creature's struggle to preserve a world in danger of being lost forever through recklessness and indifference.'

Marc Craste notes, "Parts of the film were storyboarded. Parts had only a couple of sketches as a guide. And then there were parts of the film done from scratch during the previz. Very often I was presented with multiple takes of scenes within a sequence. Then I'd have the luxury of picking and choosing those takes which I felt best sat together. Sometimes an extra shot would be added, or perhaps a new idea would surface, a different way of realising the action that was simply too good to ignore and so the whole sequence would be redone."



Based on various sketches and designs we came up with the geography and layout for the film. We created loose and blocky performances of the characters interacting with the environments and then set to filming them with various virtual cameras.

Because our work had to feed into the main production being done at Studio AKA, we had to be very economical with our scenes. The delivery of our work was contained in just a few Softimage XSI scenes. The supplement QuickTime edit that we also supplied was carefully 'slated' with frame numbers, scene names, dates and versions. This meant that on the AKA side, the assets and cameras could be unpicked with ease. We also snapshotted the hero Varmint in some of his poses, so that even at previz level, the rigger at AKA could see how the hero Varmint should be articulated.

The House of Curves - *Soulwax Machine*

Soulwax Machine was a project directed by Saam Farahmand. A risqué film which needed to look like one long meticulously crafted camera take, timed to music and involving live action machinery, a nude woman and CGI elements.

Having a diverse idea such as this that had potential to look confusing, offensive, even boring at times, combined with the delicate nature of shooting a nude, very low budget and a short space of time to shoot the materials, all made previz absolutely crucial. It helped us figure out what the camera should be doing and when, spatially which angles things like the conveyor belts could



be best shot, and how best to reveal the Soulwax logo at the end without losing the excitement built from the raunchy images seen before. Once correct, many iterations down the line, it became our absolute blueprint for the entire production.

The final film can be seen here: <https://vimeo.com/30905088>

WARNING The film is of a graphic nature, and contains full frontal nudity so may cause offence In fact the next paragraph is about the *The Inbetweeners Movie*, so maybe skip the rest of this chapter entirely if you'd prefer not to be exposed to provocative and explicit material!

The House of Curves - *The Inbetweeners Movie*

The Inbetweeners Movie was a surprise hit of summer 2011. We were fortunate enough to be the sole VFX vendor. As well as having to make a winter's Majorca look like a hot Greece by painting out raindrops and adding blue skies, removing flesh coloured thongs from the bashful actors in the nude scenes and adding time-lapse moments to spice up the night time intros, we were charged with the brief of creating a *Harry Potter* style shot with a classic Inbetweeners twist. Director Ben Palmer wanted a *Simpsons*-like start to the film with fluffy white clouds in the sky, the camera then racing down into a quiet sunny street, in through a window to find lead actor Jay preparing to pleasure himself at his laptop. Empire online gave the movie a good write-up and even commented on our shot.



“Happily, the movie also has cinematic chops. Early doors, the camera starts high in the sky and then swoops down through suburban streets and up to a window where Jay is having a hand-shandy using the internet, diving goggles and slices of honey roast ham - its *American Pie* directed by David Fincher.”

The previz in this case relied on using google maps of the proposed locations, building low poly houses and cars to propose various shots, then allowing helicopter, hovercam and steadicam crews to inform us what was physically possible to shoot. Once we were all happy that the previz both looked good cinematically and was achievable according to the multiple teams shooting their own sections, it then became the resource on location for where and what to shoot.

Previz case study: Xavier Zahra

It was a joy to meet graduate Xavier Zahra from Supinfocom some years back. He approached me with a very unique showreel. As well as studying and working in areas of CGI, he decided to focus his work on Previz. The student film *Weekend en Foret* was entirely previzualised. Xavier comments...



"I've always been attracted to the camera, at the time my graduation movie was being developed, it was crucial to me to get the framing to be part of the narration.

After the difficult start a student movie often gets, I managed to convince my colleagues to let me be in charge of the previz and the editing. This was not an easy task. As students, everyone wants to have their say on everything and it's often hard to let go.

So as a first step, the Previs was the best way to show and prove what was essential for the narration. Then it was also a way to get to experiment and figure out shots that we wouldn't have even thought of at the storyboarding stage.

Once it was in good shape, we finally let go of all of the useless tasks we were doing at the time to focus only on what would make it to the cut. Unfortunately, this was way past the middle of the year when we reached that stage and started to work efficiently. That's what you almost always end up doing as student. The good thing is, you develop your own pipeline, you figure out things to make it work for your project. But the amount of time, sweat, cries, nervous breakdown you could save, if you all agree early to use your previz as a backbone for your project is potentially tremendous.

Plan ahead on modelling your proxies up to the scale you will use. Reference everything you can, so your previz is evolutionary and becomes your work in progress and finally becomes your final cut. 3d animation is not live action... take advantage of it! Block a rough animation of a full sequence and only then break it down into shots. Your continuity will be perfect, you will surprise yourself and discover new angles and when you do your first pass of animation, your cameras are timed and ready, all you need to do is refine it to make it even better. We did the mistake of working shot by shot within the same sequence for animation... We actually ended up having to redo it from scratch due to the complexity of what was happening. What took more than 3 months to setup took only 2 days to re-do as we treated it as one continuous animation.

I remember someone wanted to model absolutely everything that was involved in "the world of our story"... doing UV's for an apple which end up being a pixel in one shot, modelling sets that we would never use, etc... Fair enough, if you want to build your modelling showreel, but at the end of the day you work as a team for a project.

Build your structure with the previz, then elaborate and make your shots looks good... and then if time, make them look GREAT. We really found a good workflow once we'd decided to stick with the previz. After that, shots were looking better and better, things were really moving forward... We didn't get to finish everything we wanted to, we had to sacrifice big shots that might have made a difference. And we could re-prioritize; we could find ways to make it work, thanks to the previz. All the team members were very talented, but the pride and ego took over things most of the year. You reach the end of it, and you have to deliver.

Our vision changed to: we need to make it work at all costs. This is very unfortunate and frustrating, and I hope that students who read this understand the importance of a good pipeline and working efficiently to serve the project. At the end of year jury, we ranked fourth in terms of overall scoring... fourth from the bottom of the list. In hindsight, my team and I agreed that the earlier we might have followed an efficient workflow, the better the movie might have been.

I didn't care much about the visual style and didn't care much about amazing visual effects. I didn't even care much about making it look good... I just wanted to make it work. And despite the final result, despite what I thought might be a handicap for me to find a job due to the unsatisfying result... It did work. Indeed, our movie was a horror movie, a B movie, which is not to the taste of everyone. I don't feel that the animation was great, I thought the grading looked too dark, the character design had faults. They were things we were aware of, and I think things which brought our mark down. I think the previz, which doesn't contain any of this stands alone.

When I asked a member of the jury why he gave us a low mark, he told me: "when I saw the main scene, it gave me actual shivers down my spine, and I couldn't stand the feeling". This very comment validated my work, more so than the mark. The build-up of the scene, the timing, the dragging weight of the camera were the ingredients that generated the feeling of horror. The feeling had been here all along, right from the very first very low poly version of the previz.

As a member of the industry myself, I never see good previz within showreels. It's both a shame and a missed opportunity."



Since graduating, Xavier has had a glowing career working as a digital cinematographer for directors such as Garth Jennings, Alfonso Cuarón, Kate Bush, Pete Candeland and Neil Marshall. He's worked on *Wrath of the Titans*, *Game of Thrones* and *Gravity*.

Previz Summary

So Previz can be used in many ways for many types of projects. In all examples it serves as a preproduction tool to feed the many facets that make up the crucial next stage, which is usually the main production. The more you put into it, the more it becomes the beginnings of valuable scenes. The more accurate the timings, and measurements, the more useful it can be to aid a real world production, and finally, it's not a process exclusive to CGI and VFX projects. My next project is to create the catwalk show for Louis Vuitton in Paris. It's a live event, but I've built the set, the audience, the visuals on the screen and the models, just so that we can see how the contents on the screens might look with the clothes, and then to show the models their cue points on the day and finally to instruct the camerapersons where best to film them from.

(The film posters are of course Poltergeist, 2001 – A Space Odyssey and Life of Brian).

Section 3 – 3D assets

Muppets exercise

Section 3 – 3DA01 – v1

At The Animation Workshop, I ran a course on rigging. Wanting to find the simplest thing to rig and animate, I came across the ‘Dancing Muppet’ from *The Muppet Show*. As our first exercise, everyone built a very rudimentary rigging system, to conform to industry standard requirements.

It needed to be

- Named well for easy selections
- Scalable
- Zeroable
- Fun and fast to use
- Pipelineable, so that it could be ‘referenced’ into a larger scene of Muppets



After rigging, the animators customized their Muppets with fun colours, eyelids, and hats etc., animated their Muppet alongside the original one, and saved out the scene. Once brought into the master scene I built, we had a whole troupe!

To evolve this project further, I recommend you look through my progress scenes, see how I’ve constructed my Muppet. Look how I’m naming things, look how I’m using locators to inherit some of the transform information so that the ‘puppets’ are at zero in their default state. Then make your own! Custommuppet it. Rotoscope the footage (see how in Chapter 10) ...and do something special with your very own Muppet. Maybe render it into one of the supplied backplates? Do a team project, it’s all up to you.

When the ‘die hard / I wanna build guns’ scoff at the ridiculousness of the seeming simplicity the exercise, look once again at the student Masterpiece *Overtime* created at Supinfocom and consider the modelling and rigging involved in those very simple creatures, and the worldwide success it reached.

My next evolution of this folder is to do a video diary showing the making of a dancing Muppet.

Maya passes

Section 3 – 3DA02 – v1

In the physical world there are many factors that make things look the way they do. Leaves lit by the sun, glow green as light penetrates the surface. Its fine furry coat gives off a halo effect, the drips of water on the topside amplify its cell like detail and cast a combination of shadow and caustic light.

When I was learning lighting and texturing, I'd try to get all of these factors rendering into one final image. In some CGI movies (early Pixar and DreamWorks) most scenes were rendered from one lighting setup. Nowadays most CGI features and all VFX movies are rendered in what are known as 'passes'.

These break up the rendering into the core components of what make up a photoreal image. These can then be recomposed in compositing software and various levels and compositing methods can be used to fine-tune the CGI work into something very realistic looking.

Common Passes:

- Beauty
- Matte
- Chrome or Reflection
- Specular
- Form
- Ambient Occlusion
- Diffuse or Constant
- Motion Vector or MV
- Shadow
- Self Shadow
- ID mattes
- Depth
- Facing ratio or Fresnel or X-ray
- UV remap
- Tracking Marks

The folder contains a Maya scene with most of these passes included. Since release of this document, changes in the software may have enabled some of these to be processed automatically. However it is useful as a point of reference. These passes have been a standard delivery of mine spanning my fifteen year career.

Section 4 – 2D assets

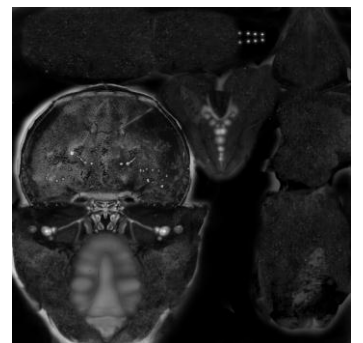
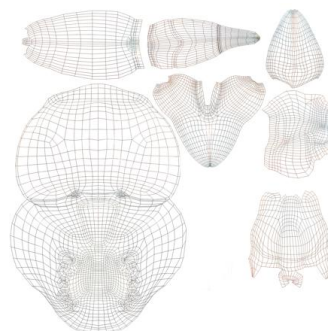
Crab textures

Section 4 – 2DA01 – v1

The contents of this folder show the Photoshop workings in order to obtain useful textures for CGI rendering. We needed to create a colourful crab to carry a plate of food over to a kid in a restaurant. For photo-realism, we scoured the internet and found as many high res textures as possible - photos of crabs from various angles, with as little noise in the pixels, as little directional light, and fewer highlights as possible. From this we can create a jigsaw puzzle of textures which can be warped onto the UV set. Once all is in place, we then start blending the photos together. First grading the colours together, then feathering the edges, then some cloning and lastly some physical painting where cheating doesn't quite allow you to get away with the joins.

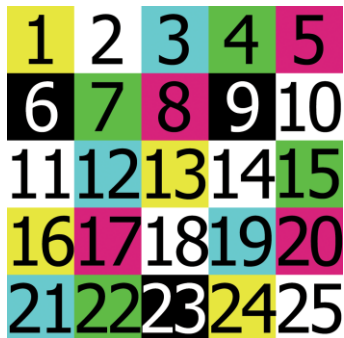
From this point, we desaturate the map for the bump/displacement maps. I avoid using Zbrush and Mudbox if possible, but only because my brain doesn't allow for any more complication. So in Photoshop, I paint white dots and vein detail where I believe bumps might be on the crab. I then split this map into two. I increase the contrast to bring out all the specular details and save this off for my bump. Then I make a blurred lower res version and called this my displacement. It means that you're using the best of both facilities and avoid flickering, weird geometry and long render times.

Google 'Only in Hotel Atlantis' to see the full spot.



Texture grids

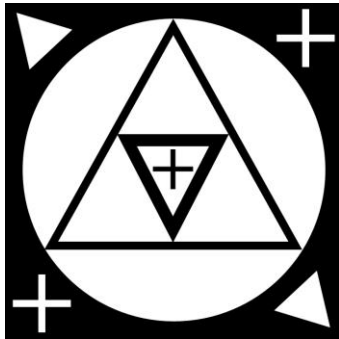
Section 4 – 2DA02 – v1



I made this texture grid in the early Framestore days, and I still sometimes get to need it! It's often the case that in 3D it's tough to know on your 2D maps where certain parts will show up on the 3D object. Mapping the object with this grid sometimes helps to pinpoint things and find your way around. XSI now have one of their own, it's more detailed so try to get hold of that one also if you can.

Tracking markers

Section 4 – 2DA03 – v1



I found this tracking marker loitering around the internet and thought I'd include it. As part of your shoot kit, it's worth printing and cutting some of these out at various scales. The good thing about this tracking marker is that it has tons of things for different trackers to cling onto. The downside to tracking markers in general is that they potentially cover up vital details on your plate, so consider this as you're using them, as you or some unlucky soul is going to have to paint them out later!

Texture examples

Section 4 – 2DA04 – v1



This high resolution dog texture was created for a Bingo commercial at Smoke and Mirrors. Based on lots of close up photographs, note how high resolution the map actually is.

New versions of this folder will include more examples as I get them.

Section 5 – Green (and blue) screen

The Greenscreen elements GRS01 - GRS04 were filmed on our final afternoon at the workshop in Teesside. We had a lot of fun trying ideas, they can be used to try compositing of your own, or as guide for things to shoot yourself.

Smart phone commercial

Section 5 – GRS01 – v1



This is as basic as it comes. In the clip you'll find one character dancing. The exercise is to extract a matte and use it to comp a silhouette against a solid colour. You may remember a certain commercial that used a similar idea.

Reflection

Section 5 – GRS02 – v1



This idea was from one of the teams, and relates to some background plates we shot on location in Teesside. It features two students who mirror each other's performance. The idea being to composite the shot to make it look like one of the students is a reflection of the other, but then at the end suddenly all of our visual cues are challenged as the student hugs his reflection!

Enclosed in the assets folder:

- The greenscreen - The characters performing
- The background - The original glass wall chosen for compositing the greenscreen into
- Reference - A clip showing a real performer in situ, acting out the performance
- Reflection Blocking - An element that blocks the reflection in the glass, so that we can only see the objects *through* the glass. The composited reflected character should be reflected in a similar way.

Bar scene

Section 5 – GRS03 – v1



One final scene we shot for fun. It might be useful!

Skyscraper

Section 5 – GRS04 – v1



Two people clinging onto the ledge as others try to help them up.

Tips > Garbage mattes

The first thing I do when dealing with footage of elements or greenscreen is to create large, easily keyframeable roto shapes to remove areas of the footage quite clearly unneeded and distracting for finer comping.

Tips > Keys, roto splines and hairlines

A tricky aspect of compositing humans is hair lines (fur for animals). People try so hard to play with settings of their keyer to do the job. In lots of cases this is impossible. Individual hairs are often faint lines, less than a pixel thick against green or blue. There are few systems that will key this automatically, but there is a trick I use which works most times. It involves two processes. Firstly, you'll need to use the greenscreen footage to extract a matte. Grade it, desaturate it, invert it, whatever is needed to extract a really good natural matte. This should look like a solid white image, with clearly defined edges matching where the edges of the characters meet the greenscreen.

What works for some parts of the key, i.e. dark areas, may not work for others, so sometimes it's necessary to combine different keys together as a multiple composition. In this case, I might consider using animated 'roto splines' to define the shapes of some of the dirty maps, and 'brightness/contrast' to find the right levels to see the hair. This won't be solid white, this will be soft white/grey strands against black.

Once you have a good clean matte, the next process is to 'multiply' out the colour around the edges of the hair. If you combine the current matte with the greenscreen footage, you're likely to find that the hair is green around the edges. So what I normally do is flood/colourise these areas before it goes through the keying process. This makes up the 'fill' part of the image.

The way I try to explain why I try to flood the 'fill' is by the literal example of a cookie cutter. Imagine making star shaped cookies, with the aid of a star shaped cookie cutter and using red food colouring on the surface of the dough. One way would be to imprint the shape lightly on the surface, then paint the red shape inside the indentation. However, once cut, the cookie cutter might crop parts of the red and get bits of the dough colour too. It would be more sensible to flood the dough by painting over (multiplying) the edges, so that when you cut, you get a perfect red shape.

Tips > Example background

Even if you're not yet equipped with a final background to place the foreground characters onto, it's good to have a range of backgrounds to test your keyed footage against. You're testing to make sure that green isn't spilling and that your matte edges are clean.

TIPS > Green spill removal

On the most expensive greenscreen sets, it's sometimes difficult to avoid 'green spill'. If you have elements like clear glass or chrome or shiny parts of your costume, green finds a way

to bounce onto your main characters. One simple trick is to try playing with colour channels in your compositor to reduce green from the overall image. It may give great results for most areas, like clothing, but take too much green out of the face. So you therefore may need to make extra mattes for skin tones and treat these areas differently.

Aquarium

Section 5 – GRS06 – v1



Whilst in the aquarium at London Zoo with a Canon 5D I came across this strange wondrous fish. The blue walls behind the tank made me think it would make a great compositing exercise. The challenge therefore is to get a good key from the fish, take the mid ground elements and comp them all over the background.

Another great exercise is to do a fish rigging project and use this hovering fish as a 3D roto reference.

TIPS > Borrowing Light

If you're going to attempt putting your own CGI fish into the image, consider trying to extract some of the caustics from the light dappling on the back blue wall.

Section 6 – Elements

Small fountain

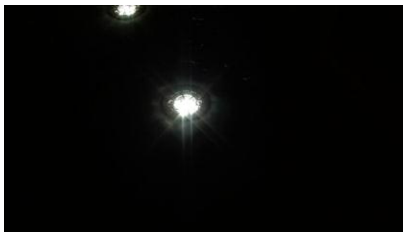
Section 6 – ELE01 – v1



This little fountain spurt was sadly the last of the fountains the night we shot. Just as we'd got our cameras locked off and card positioned! Even so, it's worthy of some attention. A valid test would be to extract a good matte for it, convert it to frames and load it onto a Geometry plan in 3D software as an animated sequence.

Water lamp

Section 6 – ELE02 – v1



This is a very simple element, mainly surrounded by black. Try stabilising it, looping it, and replicating it, with time offsets to create more of them.

Fountain

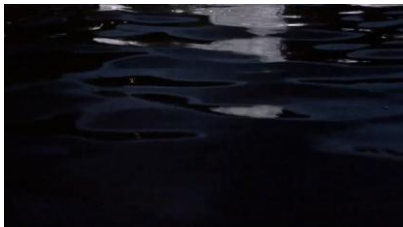
Section 6 – ELE03 – v1



This is very pretty, except for the shopping street behind. Try painting it out!

Ripples

Section 6 – ELE04 – v1



Ripples like these can be really useful for compositing. However the clip is short!

Try to loop the sequence. It's not as easy as it sounds. A simple cut is noticeable. A dissolve back into itself is less noticeable and a good start. An animated roto matte brings the beginning of the clip back through as you wipe off the remnants from the end and this would be the most invisible way to do it.

Looping elements can be so useful. Especially for really long shots where you need to fill a room with atmosphere and you've only got a short amount of faint smoke footage.

Section 7 – Background plates

Time-lapse with building

Section 7 – BPL01 – v1



This was shot on a tripod over about 20 minutes. We left one camera running and stayed out of its way. We loved the way the sky reflected into the building on the left. Consider placing an object mid distance away, reflecting in the building, using some 2D warps, and lit using the actual time-lapse footage, so that light appears to be flickering over your object.

In a more developed project, we may have had a chrome ball, just off to the right of this setup, with a second camera filming reflections. Lined up, and unwrapped, it would have supplied an amazing animated reflection map for chrome like surfaces.

The footage is slightly skewed so an adjustment needs making to rotate the image.

Reflection walk

Section 7 – BPL02 – v1



A basic shot walking down the side of the Teesside Modern Art Gallery. Warp Stabilise (or similar), track and add objects or a walking character into the plate, remembering to render the reflection too!

Gritty sand walk

Section 7 – BPL03 – v1



This ground plate would be great for a small object to crawl or run over - snakes, beetles, etc.

Warp Stabilise (or similar) the plate, track, and get one of your characters interacting with the plate.

You might also want to paint out the letter box and sign you see in the distance at the end of the shot.

Coastal panorama

Section 7 – BPL04 – v1



A simple but unstable pan along the coast. Remember if you stabilise, grade and treat the image, show your "before and afters" in your breakdown reel.

Coastal lock off

Section 7 – BPL05 – v1



A very simple plate. But the foreground stream running into the sea makes for a great source for reflections of large things in the surf of the coastline.

Foliage

Section 7 – BPL06 – v1



I liked what one of our students went away and filmed here. Consider animating CG butterflies or birds interacting with movement of the branches. Or you could film greenscreen and add them in!

Sky foliage

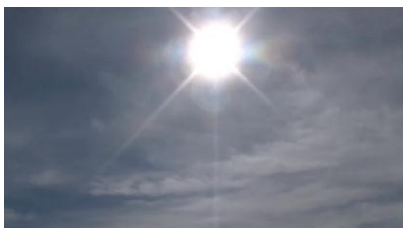
Section 7 – BPL07 – v1



This is a good plate for large creature you tend to look up at. A diplodocus head springs to mind. This is good for integration as you'll need to make a good key for the foreground greenery.

Sky with sun

Section 7 – BPL08 – v1



A nice plate with some good chroma flares pinging off the sun. Good for pterodactyls, planes, etc. Research what happens when things fly in front of flared objects. It isn't just a simple A over B composite. (You can even do it with an iPhone, but be careful not to look into the sun during this testing phase!). If you do more of this type of research, include it into your breakdown. It shows that you have an explorative tendency, and I find this character trait makes for

excellent composers. There's a glitchy frame within this image sequence, this can happen frequently when dealing with footage, so this needs fixing as part of your work.

Beach handheld

Section 7 – BPL09 – v1



Crabs, Tremors. This plate has some great parallax to show off some cool creature animation. Good flat sand, scope for a nice diffused reflection. One of my favourites.

Grassy crash

Section 7 – BPL10 – v1



This crazy shot was filmed by one of our crew running up a hill. Might be good to flash creatures into it now and then. You might even adopt a 'day for night' technique to make the plate scary. Day for night is commonly used in the industry where an image shot at day with the sun shadows is graded dark and tinged blue to look as if it were shot at night instead with the shadows from the moon. Dirty trick,

but it sometimes works! (Great for a shot and tell!)

Factory

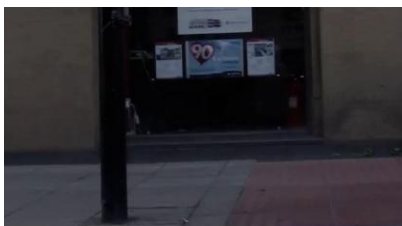
Section 7 – BPL11 – v1



This is a good candidate for sky replacement, tower replication and smoke augmentation. Try filming your own smoke on a smaller scale against black.

Street pans

Section 7 – BPL12 – v1



These street pans were shot at the end of our shoot day by pointing the camera out of the car. The 'raw' file is the original take, and the other file is a stabilised and post motion blurred version. A great dynamic plate to show off running cycles for creatures and humans alike.

Dino Park

Section 7 – BPL13 – v1



Unlike the Background Plates (BPL) mentioned previously. These two folders contain the HDRI information needed to create High Dynamic Range lighting setups to get accurate lighting onto your characters.

The idea for team one, was to have a camera scanning over the grass and lifting to find moving sculptures in amongst the Dinosaur sculptures already in the park on the outskirts of Teesside.

The chase

Section 7 – BPL14 – v1



Another option which arose from the Dino Park shoot. We shot a couple of plates with the concept of perhaps adding some kind of beast chasing the students.

Cats Silhouette

Section 7 – BPL15 – v1

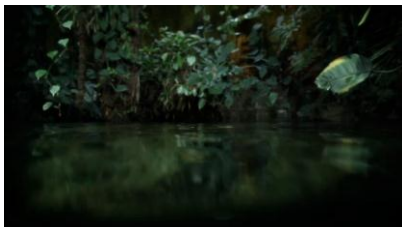


A happy accident whilst working on the cats for Hiscox *Superstition*. The rig didn't scale correctly and instead I was presented with weird, gangly sculpturesque versions that still walked correctly! Therefore one of the student project ideas was to have these looming giant cats walking across a coastline. We did a HDRI shoot for this location, and you can convert our shots into your own HDRI images. Go to

Section 8 for a complete run-through of the process.

Amazon

Section 7 – BPL16 – v1



This was shot at London Zoo in the Amazon Section on a Canon 5D MkII. Notice how much better the quality is to that of the plate leading up to this. Even in this case we encounter compression and other artefacts which come with a camera that saves lots of data into a convenient QuickTime format. Improved quality comes in the form of the new Canon c300, the Red One or the Arri ALEXA.

The camera pans down from above the water to underneath. This was a handheld move with the lens pressed to the glass for some stability. It needs stabilising, and can then be used for comping of some Amazonian creatures.

Piranhas

Section 7 – BPL17 – v1



With reference to the '3D roto' section (10_3DR01_v01) these piranhas are great for rotoscoping and for a CGI copy to be integrated into shot.

Time-lapse sky

Section 7 – BPL18 – v1



This was donated to the cause by Richard Tucker. He was my original mentor as I was learning about 3D. We created trippy fractal videos together. He taught me about photography and he helped me render my scenes. A few weeks of rendering that nowadays would probably take about an hour on a reasonably souped up machine!

Richard must be around 104 now, but is still going strong, learning the latest Vue Desprit, designing photography books and making lovely time-lapse sequences such as this. <http://www.rtfract.com/>

Consider replacing the trees with a city skyline, and reflecting the clouds into the buildings.

Maybe build an expansive lake, and again reflect the sky into the water, rippling away at time-lapse speeds.

I tried running the sequence through RSMB within After Effects, and the motion blur removed some of the drastic flickering.

Helicam Lake

Section 7 – BPL01 – v1



On the way back to base, after a long day filming cloud after cloud for the Inbetweeners Movie's opening sequence, we flew over this lovely lake. I asked the cameraman to record a few seconds. This is what came out. It poses a few challenges. It's slightly compressed, milky, and has some water drops flickering on the lens. The first challenge here would be to do some clean up. Again a warp stabilize might iron out some kinks, and then beyond that, who knows!

Section 8 – VFX

Shooting techniques for CG integration

Section 8 – VFX01 – v1

a) Plan your VFX shot

You'll need to decide what CGI asset you'll be integrating into a live action plate. Is it something moving like an explosion or a creature? Or something static, like a building or a statue?

Previsualise the shot(s). Build your CGI asset, even in rough form and animate it inhabiting a very blocky version of the background that you'd like to shoot. At this early stage you can figure out camera angles, speeds and action. For locations I'm always getting satellite pictures from Google Earth, it comes with a distance guide so you can model things accurately. Google street view can also be extremely useful for previz texturing and where applicable Bing maps show some areas of the world from four different 'birds eye' views which show the sides of the buildings.

Whether previzing or jumping straight into it, you'll need a virtual camera. To get a reasonably accurate camera in Maya off the bat, I create a 'new camera', set the render globals to HD1080, then in the camera attributes I set the film gate to "35mm Academy".

I normally adjust the field of view using the Focal Length section, not Angle of View. Note in the Varmints previz, lenses are in whole numbers like 24mm and 40mm, not ambiguous angles like 28.92° wide. Directors and D.O.Ps talk in this language.

When I previz film sequences, I source the Carl Zeiss website for a list of 'Master Prime' lenses. When a director asks what lens it is you can say with conviction 'oh this was a 21mm, quite a wide one' or 'I used a 100mm, wanted it to look removed like a paparazzi photographer using a telephoto'. I've added a picture from the website into the folder.

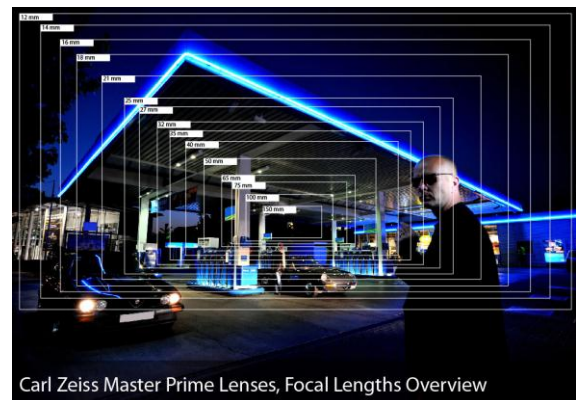
You can also find the picture online [here](#).

Print this for your wall and use the range of lenses from the list in your work.

Source Chrome Balls and find a way to mount them in positions appropriate for your shoot. You can buy screw mounts that are same as the screw thread underneath cameras. For large balls, I've glued these on for quick assembly with araldite.

Chrome balls aren't manufactured for the purpose of being a VFX prop, therefore you have to get creative. They are often garden ornaments, ball bearings or giant baubles for Christmas trees! I found these to be very good...

<http://www.designs-in-stainless.co.uk/spheres.htm>



Source an HD Camera to shoot the plate. Remember that HD doesn't guarantee quality results. You can often do better work on SD cameras that film without compression and have better sensors to capture light and colour.

Source a digital stills camera (DSLR). The digital stills camera needs to be able to photograph high res stills and 'bracket' at various levels of exposure.

Find a zoomable or a telephoto lens for the stills camera. This should be as telephoto as possible. On a zoom from 21-105mm you'd set it to 105mm. Long lenses mean that you can shoot far from the subject, which is useful when shooting chrome and don't want too much of yourself in the reflection.

Source tripods. One for the DSLR and maybe one for the chrome ball. In our example, we're resting the chrome ball on a roll of gaffer tape. The chrome ball tripod can be cheap and rickety. But the DSLR needs to be as firm as possible.

Print the 'VFX shoot checklist' to decide what you need to take on the shoot and also some 'VFX shoot sheets' to make your notes on whilst filming. (in folder *98_EXT05_v04*).

Ideally have a laptop available to be able to download and check shots.

b) Practice using both DSLR and HD cameras with the chrome ball

Learn how to best use the HD camera:

- Turn off 'Auto exposure'
- Remove any internal 'Sharpening filters'
- Turn off 'Auto focus' (unless the handycam look is what you're after)
- Test it. Go out and shoot some things. Shoot inside, outside, at bright things and fast moving things, analyse the images on your computer. Are you happy with the quality of the image?

Learn how to best use the Digital Stills Camera:

- Find the focus button.
- Figure out how to 'bracket' up and down your exposures.
- Learn how to play back images quickly.
- Find the setting to maximize the image size and quality.
- Remove any filters. You want the images to be as raw as possible.

Run through the processes outlined below in the comfort of your classroom before venturing out onto the field. Being expedient and tested means that you'll get more out of your actual shoot. And you won't waste lots of time fiddling with camera settings. Sometimes you're shooting under the pressure of a whole crew watching and waiting impatiently to collapse a set. Or the sun might have another 5 minutes before going behind a building.

On a real professional shoot, it's important to appear fast and efficient. Even if you know what you're doing but are spending a long time capturing your stills, it'll give off the impression that you're a bit of a novice.

c) PR folder

As an aside, to help with your reels, start a folder on your computer for each job you do called PR, to contain a junkyard-like mess of flipbooks, QT's, Google maps and images documenting your process.

As you shoot things or plan things, copy images of interest into this folder so that it's easy to cut a 'making of' afterwards. Things don't need to be in any order at this stage. I'm often left with a messy folder of png screen grabs, jpgs, and avi and mov files.

But it's so much fun and so easy to get a vital extra 30 seconds of showreel demonstrating that you understand these fundamental and industry standard techniques. Going back through 1000s of folders on the network months down the line is a daunting task.



d) Shoot your main plate first

This is going to be the background for your visual effect.

Get the best quality camera possible. Ask your tutor what cameras are available and do some research. HD camcorders don't necessarily mean you're guaranteed good results. If footage records straight to a tiny SD and you have the ability to capture hours and hours on this small card, I'd be panicking, as this might mean that your footage is going to be heavily compressed.

Maybe the college could negotiate for a local filmmaker to come in and do a day of shooting for the students on a RED or Canon 5D MkII or III. The better your footage and the nicer your camera move, the better your final shot will be on your reel.

Look at Filmakademie's *A Maize* for an example of top class cinematography and quality of background plates.

Once you've shot a few takes and think you have the one you need. Download it onto your computer whilst on location and look at it objectively. Questions to ask yourself should be:

- Can I insert my CG into this shot?
- Am I moving the camera at the right speed?
- Have I composed the shot well?
- Is there enough exposure detail in the shot i.e. is there colour information in the whitest and blackest areas? Some cameras show peaking areas as a setting in the form of histograms or moving lines shown visually on the cameras monitor.
- Is the compression acceptable?
- If the light on location is changing quickly, i.e. at sunset, this decision process needs to be done very quickly. The more you shoot, the more you'll instinctively know what you've got in 'the can'. Don't rely on a viewfinder to give you the true impression either. You may get back to base and have a shock, when you see on your large screen an under-exposed heavily compressed and overly shaky piece of work. Believe me, it's gutting.



e) Shoot 'Chrome Ball Reference'

Whilst the camera is still mounted, hold up the chrome ball into frame for reference. Hold it up to occupy the left half of the frame for Maya comparison purposes later. This is not your HDRI image, but will help later calibrating your HDRI environment map.



f) Shoot REAL Reference

The 'real' reference is often overlooked even in the most professional of shoots. It basically involves filming references of the surfaces that you're trying to emulate in CGI.

If you're adding a statue to the environment, consider taking a chunk of bronze, marble or stone to film it in situ. It will tell you so much about how light responds to the actual surface, how shadowed it gets and how its shadows look in the environment you're filming. And when you're on the computer trying to make your work look real, you can have this reference to use as a direct comparison.

For a commercial I worked on featuring dinosaurs I had an iguana brought onto set. We filmed it for a few seconds moving around in my hands in each shot we filmed. It meant that we could see how its reptilian skin reacted to all of its environments. There is a QT of 'REAL REFERENCES' in *the 08_VFX01...* folder.

- You can see me holding up a load of fake black fur objects in the middle of a street in Prague.
- A block of ice for the 'Die Another Day' shoot. We had to create a CG ice maiden. The way the light caustics battled shadows on the wet wooden floor was really useful stuff.
- A kettle for the British Airways shoot. We rotoscoped the movement and then tweaked the render of the chrome and its anisotropic light effect until it was accurate enough to go into the final shot.





g) Measure the lens (using the 1 metre rule)

Some VFX jobs require guesswork. Comping something into a shot from a movie or from old archives means that there are no, or few, cues to where cameras may have been positioned on the day.

However In most cases you'll have opportunity to recreate the camera in CG based on accurate data. On locked off shots, or panning shots, you can cheat things a lot, but for physically moving cameras you'll need to make sure the angle of view or 'focal length' is matched. You may be able to get a reading off the lens just by looking at it what it's set to. It may say something like 30mm. Sadly a range of lenses on a range of common cameras all reading the same focal length, can fluctuate dramatically based on a variety of variables:

- Brand to brand of lenses or camera model
- Whether you're using a video or a DSLR camera
- The software that you're using in 3D that supplies the virtual camera
- How you're setting your camera up in your software
- If you're using prime (fixed) lenses or zoom lenses.

If possible, I do record the camera information in this traditional way and note it in the 'VFX shoot sheet', but I also have one tried and proven method of recording the lens in case all else fails. I have an extendable ruler one metre in length, this can be anything though so long as it's one metre. Cane, tape etc... Then once I've filmed my plate I position the 1m ruler in front of the camera so that through the viewfinder the cane is visually reaching the horizontal edges of the screen with no gaps or spill.

Then I get someone to measure the distance from the lens to the middle of the 1 metre ruler. I take note of this measurement and write it on the shoot sheet. If the 1m measurement was say 1.45cm, I reconstruct the same scenario in Maya. Create a camera, position a 1 metre pole 1.45 cm away.

Then alter the focal length until the edges touch the sides then you now know you have an accurately matched camera.

h) Interaction elements

If you need to punctuate impact between your CGI characters and your environment, you might want to shoot some interaction plates. In the desert a foot landing would kick up some sand. If the sand is not going to be CG, you might wish to shoot it. Interactions don't just have to be physical connections.

For the *Europride* commercial, I shone red bike lights onto mirror balls which cast light over the sets. We turned all the lights out and filmed light interactions all over the sets, which we then timed to match the performance of the character.

Consider nudging bits of set for real within your actual take also. Photo frames falling off walls etc. triggered by CG elements all add to the realism of what you're trying to achieve.

i) HDRI Chrome Ball Shoot

The point of photographing a chrome ball is to capture as much light and textural detail from the surrounding environment as possible. The resultant image contains light intensity and photographic detail, meaning that it can be used as both a spherical light source and a reflection map.

Taking photographs of a chrome ball means that as well as seeing light and parts of the set behind the camera, we can see elements to the left, right, above and below as well. The only bit we can't see is directly behind the chrome ball. Often not much of an issue and your own further research will show you ways of capturing this light and detail too.



- On a film set ensure that no-one changes the lighting inbetween shooting the main plate you photographing these vital images.
- Set the chrome ball where it best occupies the space given for your CGI element. So if you want a character standing on a table, set the ball in the same place.
- Set the lens to its longest zoom setting. The longer the lens, the more it can focus on things far away, the further away from the ball you are, the less you and the camera will be visible in the chrome.
- Set the DSLR on its tripod from the angle and position of the HD camera. Move the camera forward or back until you've framed the chrome ball without cropping anything. Don't zoom in! Remember to get as far away as possible.
- Next you need to set up to photograph a bracketed series of 7 images. Multiple exposures that are of equal distance apart on the exposure metre. The exposures need to be of such variety that the following conditions are met.

The first image is relatively overexposed, details are still visible but the bright areas are very dominant.

The middle (4th) image is correctly exposed. Depending on the image there is detail in the blacks, and the whites are on the borderline of peaking.

The last (7th) image is underexposed. The image is almost black, highlights are just visible and the sun is less a gleaming white orb and more a duller and solid circle as if you were seeing it through thick sunglasses.

The aperture should be narrow so as to remove as much depth of field as possible. This will also limit the light entering the lens, so this is a balancing act. I normally start with something like f8 and adjust the exposure until I get an image that's correctly exposed. Let's say in this case the readout is 1/60 of a second. I take that picture, and then shift the exposure 15 stops up. Take the photo, then revert back to 1/60 and go the other way, again 15 times. Take the picture. If my pictures conform to the rules above, I'm ready to take all of my HDR images. This process of testing can be done as the main shoot is going on to save you time when it's your turn to step in a shoot your VFX plates. So long as you have access to the location without being in the way.

Instruct people to stop moving, even behind the camera, remember its chrome. You want a unified set of images to eventually blend into one. You don't want ghosts of people walking around clearing away bits of set.

Ensuring that the flash is off and the camera quality is at its highest, RAW format (not jpegs) and the resolution is at its highest, I begin taking my 7 pictures. First I photograph my hand at 1/60. This ensures I know where the sequence starts when I download the images later. I then take the first image at 1/2 a second, then move the dial on 5 turns, photograph again, 5 and photograph until I reach my 7th image. I photograph my hand again at 1/25. I now have a series of pictures that accurately depict the lighting situation of my background plate. It's easily traceable on a camera full of random shoot pictures because of the hand images.

The list below shows most of the stops available on my Nikon D90, and in bold I've highlighted the pictures I've chosen to take in this particular instance.

... *Exposures longer than 1/1.3 seconds*

1/1.3

1/1.6

1/2 < PIC 1 over exposed (very bright, detail in darkest shadows)

1/2.5

1/3

1/4

1/5

1/6 < PIC 2

1/8

1/10

1/13

1/15

1/20 < PIC 3

1/25

1/30

1/40

1/50

1/60 < PIC 4 correct exposure

1/80

1/100

1/125

1/160

1/200 < PIC 5

1/250

1/320

1/400

1/500

1/640 < PIC 6

1/800

1/1000

1/1250

1/1600

1/2000 < PIC 7 under-exposed (mainly black, sunlight a crisp circle)

1/2500

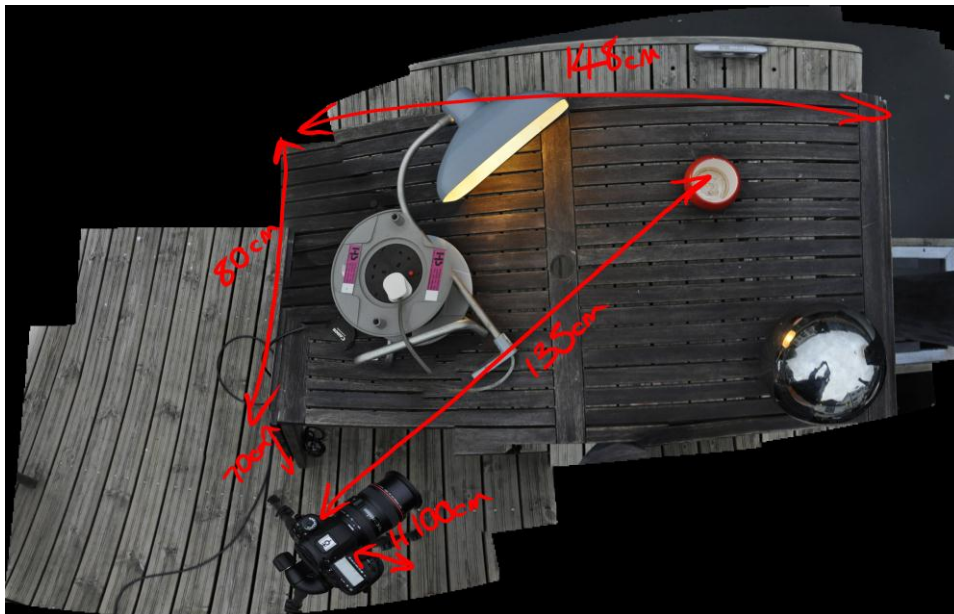
1/3200

... Exposures faster than 1/3200 seconds

j) Hi Def. References

Now take the DSLR camera and start photographing parts of the shoot that may be important later. Photograph walls of the set, the ground from above, close ups of textures, PR photos that make for good show and tell imagery. Imagine the set from the point of view of being sat at a desk thinking 'oh I wish I'd have taken a photograph of that!'

k). General Measurements



Being on set enables a certain luxury of knowing what's where, and how far things are from each other. Such things as the subject's position from the camera and the lights and how tall the walls are. On the shoot sheet, I've left room for these vital measurements. Draw a loose sketch of the set, draw arrowed lines of the dimensions you might need, and then spend 20 minutes getting the detailed measurements. Also, what are in the original plans might not be what is in the final set.

l) iPhone workaround

To combat the problem of missing anything, not knowing where the camera was positioned, how far something was from something else. I record an iPhone video at every location. Starting from walking in the front door of set, I walk around the perimeter circulating the set, then move into the set and circle the lights and camera and props. This video answers questions that stills just can't do. It informs the people working on shots, notably in the field of match moving, how the set was constructed. You may never use it, but it may also be your lifeline one day.

m) Creating an HDRI Environment Map

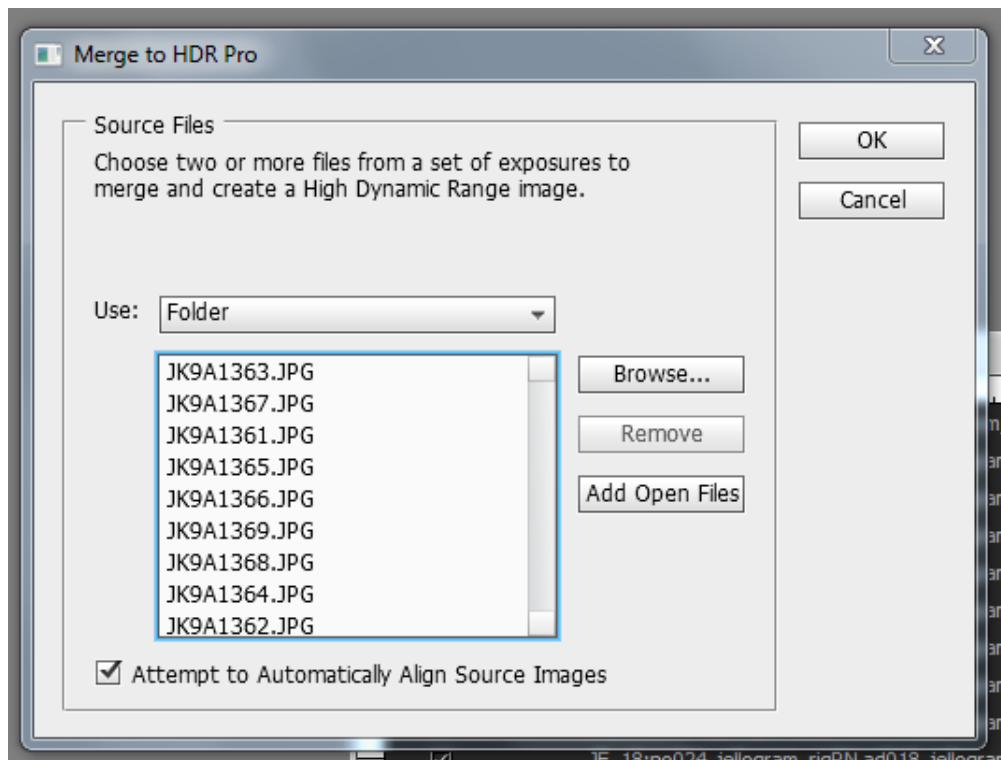
In this demonstration, generating an HDRI map from the sequence of exposures shot on the shoot day involves using both Photoshop and HDR shop, a free plugin available online. Firstly go through your images from the shoot and find the necessary 5, 7 or 9 photos which make up your high dynamic range. Rename them and move them to a new specific folder so that Photoshop can order them correctly.

DSC.0567.jpg, DSC.0568.jpg, DSC.0569.jpg, DSC.0570.jpg, DSC.0571.jpg, DSC.0572.jpg, DSC.0573.jpg

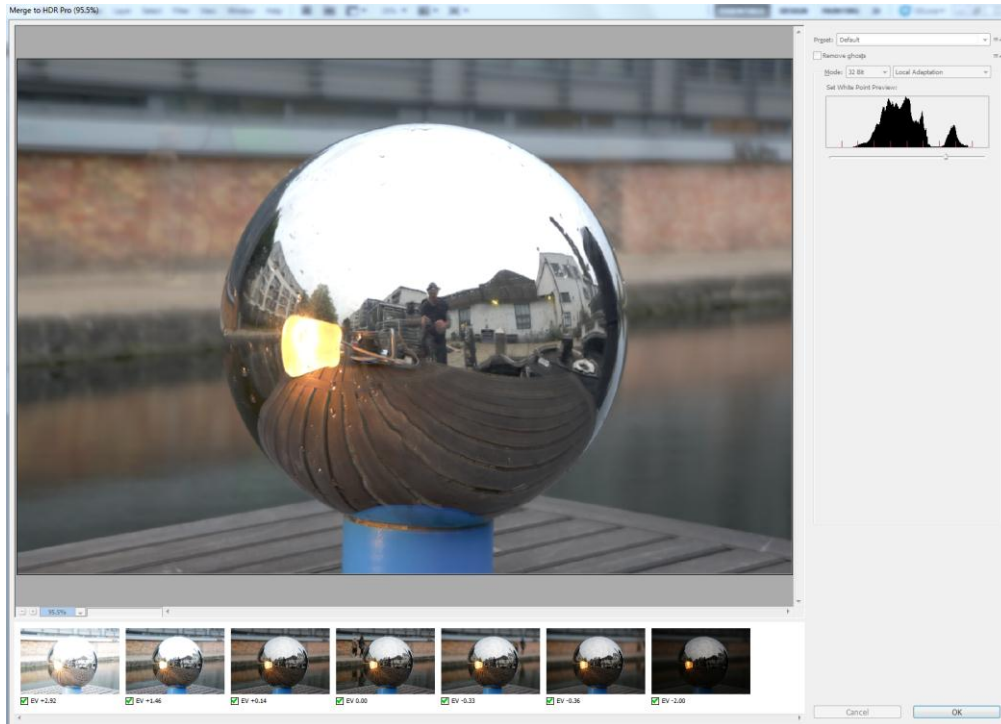
could be renamed

shot1.0001.jpg, shot1.0002.jpg, shot1.0003.jpg, shot1.0004.jpg, shot1.0005.jpg, shot1.0006.jpg, shot1.0007.jpg

and placed in a folder *shot1_raw/*



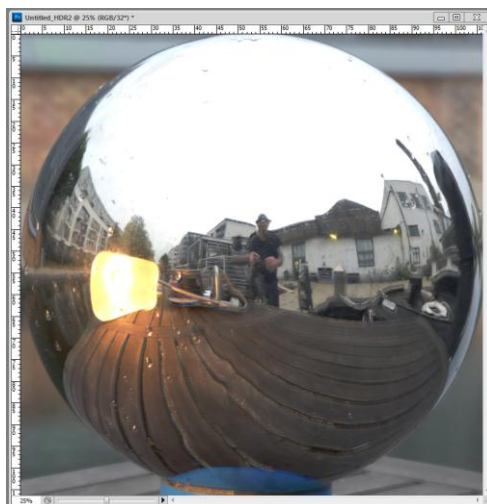
Then within the file->automate section of Photoshop select merge to HDR PRO



Within that section click 32 bit (default is 16 bit) accept the rest of the options. This now generates a High Dynamic range image, which means it has much more information stored within it about the light and dark areas.

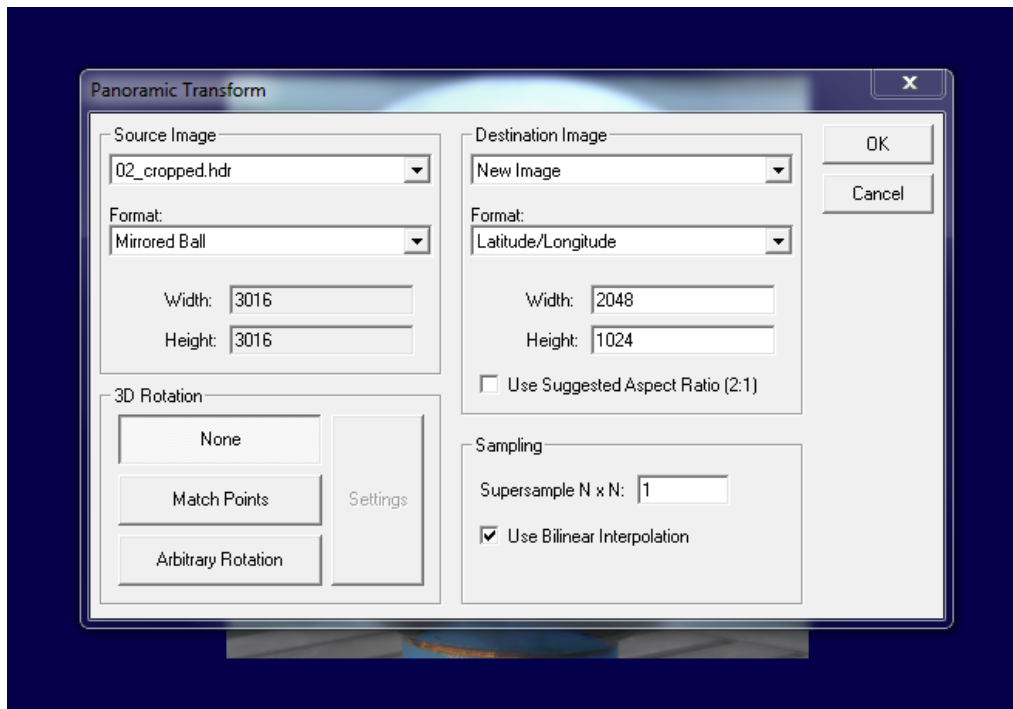
Tweaking the exposure slider should show that as you darken the image, the flared out white light bits such as lamps and the sun should get more defined, and you can start seeing the circle of the sun, and elements inside the light bulbs. Clever stuff!

Save this image as *01_hdr_merge.hdr* (.hdr is a format recognised by Maya and Photoshop for HDR images)



This image now needs cropping into a perfect 1x1 square. Crop so that the edges of the chrome ball touch but don't overshoot the sides.

Save image as *02_cropped.hdr*



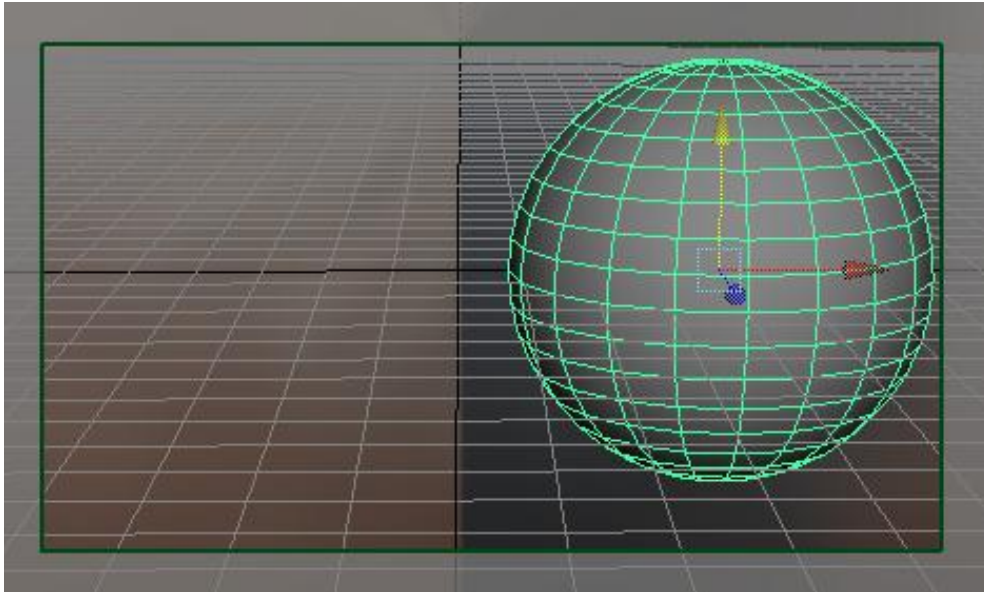
In HDR_Shop, load your 02_cropped.hdr image.

In image/panorama... select Panoramic Transformations

In the column 'Destination Image' change Format to Latitude/Longitude and up the output resolution from 1024x512 to 2048x1024 or higher.



Save as 03_hdr_ungraded.hdr



n) Test your HDRI in Maya

Load the pre-set Maya test scene 'chromeball_test_scene.mb' located in the folder 03_3DA01.

The scene that loads is calibrated in order to accept your HDRI image and your chrome ball reference pic. Mental Ray is set as the renderer, 1080p as the resolution. Anti-aliasing and other production settings should be set high enough to reach production level imagery. In the image plane editor replace the current temp image with your chrome ball reference pic. In the outliner, select the HDRIball and in the attributes replace the temp .hdr file with your own HDRI Environment Map.



Hit render, and you should see a CGI chrome ball rendering next to your on set reference.

Play with the reflection glossiness, the rotation of the 'image based lighting' node and its 'gain' levels until your chrome ball matches that of the image on the left.



This image needs gain adding to the IBL node. Brightened up it should look very similar to its counterpart.

Although not absolutely precise in its details, this has given you a complete reflection and lighting setup which is more than adequate for most VFX needs. In the next run of Assets for students I'll go more into where to take things from here, including how to use the passes system mentioned below to get completely real looking VFX.

o) Convert your background Plate footage into a sequence of Live Action (la) images

In software like After Effects load your movie file, trim to length and then export this as a high res image sequence. Uncompressed TGAs or TIFs are normally fine.

DSC1298.mov

could be renamed

shot1_la.0001.tga, shot1_la.0002.tga, shot1_la.0003.tga, shot1_la.0004.tga > shot1_la.0100.tga

I also make another set of small images, half resolution as jpgs so that I can easily shuffle real-time through the sequence in Maya:

shot1_la_small.0001.jpg, shot1_la_small.0002.jpg, shot1_la_small.0003.jpg, shot1_la_small.0004.jpg > shot1_la_small.0100.jpg



p) Test your shot in my ultimate scene > HDRI

I'm a fan of having a bunch of pre-set 'passes' in Maya. I got tired of generating good settings in Maya every time I did a job. So I started building a scene that I start with for every production. By bringing Assets into here, I can start rendering really quickly, and surfaces I assign to objects can be rendered into the crucial 'PASSES' for compositing.

Load the pre-set Maya scene (*passes_scene.mb*) located in the folder *03_3DA03_v01*. In the image plane editor replace the current temp images with your live action (la) images. In the outliner, select the HDRI node in the outliner and in the attributes replace the temp .hdr file with your own HDRI Environment Map.

Bring in your character, building, sculpture or whatever you're integrating and work through the 'passes' list assigning shaders to your models.

You'll quickly see that you have the building blocks for some amazing passes, which can really make light of complex VFX work.

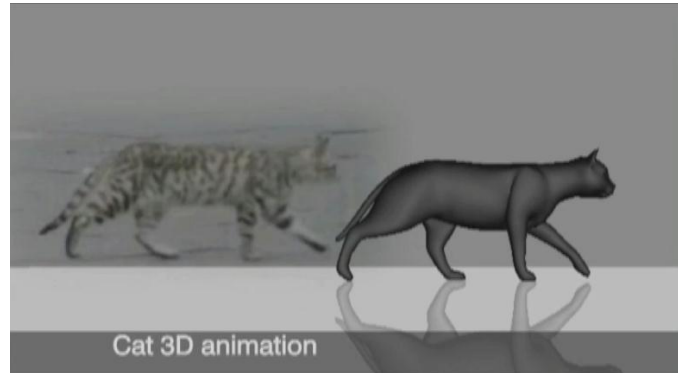
My firm belief is that the more you repeat these steps and get used to the process, the more you'll grasp the key concepts of VFX from a CGI perspective. I've grossly simplified most of these steps, and people have their own methods. But the hope is that this walkthrough gives you enough insight to be able to build your own practices on top of this. Make better pre-sets scenes, make better ways of shooting HDRI maps and this is where the world of VFX becomes fun. Share your work and knowledge with your group and students in the years below you. It's what the European schools do, and it's why their work improves year on year!

Section 10 – 3D roto

Rotoscope examples

Section 10 – 3DR01 – v1

Take a look at the video enclosed in this folder. You'll see how crucial and acceptable real life is to use as a source. Before I attempt to animate any creature, I'll first see if there's footage of real animals doing it first. There are often creatures which are similar in structure and anatomy to that of the fantasy or extinct beast you're trying to mimic.

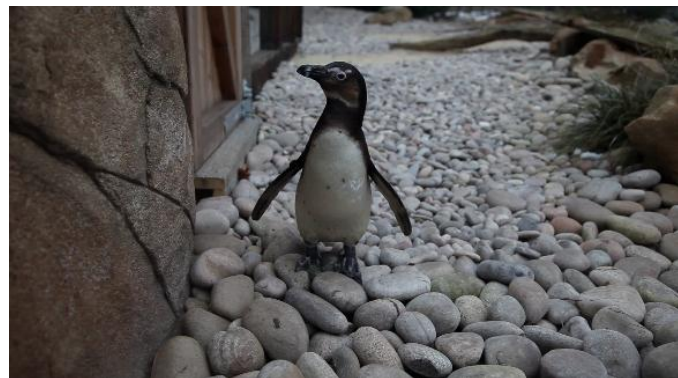


As a test to get *Walking With Dinosaurs* into the doors of Framestore, Mike Milne, then Head of 3D, built and rigged a simple Triceratops and rotoscoped the movement of a herd of live action Rhinoceros'. The plumpness of the bodies and the lengths of the legs being so similar, the motion fed across with ease. For character work, such as XBOX - Mosquito, we required hero performances from our bitey little critters. But before we got into creating our own bespoke keyframes, we first rotoscoped real mosquitoes, to train our minds as to the little nuances and vibrations and scale of the real thing. It enabled us to animate in a unique way. For O2 'butterflies' we literally used the movements of real butterflies shot on location for the action in the final commercial in most of the close ups.

Penguin

Section 10 - 3DR02 - v1

I found this guy wandering around on his own at London Zoo. As a creature study, I'd love to see an animated version walking alongside matching all the nuances etc.



Section 11 – Extras

Pixionary

Section 98 – EXT01 – v02

As I wander around the various colleges, festivals and universities around the world, I often instigate a game of Pixionary to warm up the students. Get everyone laughing, communicating, and also watching themselves work inside the software. Imagine playing the board game Pictionary, but instead of drawing against other players, you're building things in 3D against a clock.



A class gets split into two, team names chosen, a whiteboard for scores and someone neutral runs the game, starts the timer and helps listen out for the right word.

On each slip of paper there are two words, an easy (worth 1 point) and a hard (worth, you guessed it, 2 points.)

Teams take turns and nominate players, all should get a go, even the shy!

The person whose go it is chooses which word, shows the person running the game, gathers thoughts, clears the Maya, XSI or 3DS desktop and shouts go!

The clock begins and the player must model things to denote the word on the card. Cheating includes using text, drawing the object with splines, colouring an orange orange etc. Players shout out what they think the work might be until they guess or the clock runs out.

I've supplied the full kit of parts:

- The clock with the countdown music, for tension.
- A list of pre-made words you can cut up and place into a hat.
- A blank template to fill in for new words.
- The rules in image form.

You'll find it amazing to see how people's minds work, what tips and tricks other students have picked up, and after each game I always hear students comparing notes. 'Hey how did you delete those faces?' 'What's the keyboard shortcut to frame?', 'Does yours really look like that?' etc.

If you fill in new templates of words, please email me the word .doc. It's good to have a library of fun words... assets@thehouseofcurves.com

1. Bat	2. Batman	1. Button	2. Zip
1. Ice Cream	2. Ice	1. Ear	2. Earplug
1. Eye	2. Eyelash	1. Book	2. Magazine
1. Star	2. Star Trek	1. Tooth	2. Dentist
1. Pin	2. Prick	1. Feather	2. Feather Boa
1. Fork	2. Knife	1. Fly	2. Dragonfly
1. Sun	2. Earth	1. Guitar	2. Violin
1. Tree	2. Branch	1. Hat	2. Cowboy Hat
1. Hair	2. Bald	1. Lemon	2. Lemonade
1. T Shirt	2. Vest	1. Airplane	2. Shuttle
1. Mouth	2. Lipstick	1. Plug	2. Socket
1. Baby	2. Fetus	1. Shark	2. Jaws
1. Boat	2. Canoe	1. Sword	2. Javelin
1. Bird	2. Penguin	1. Pan	2. Wak
1. House	2. Bungalow	1. Clock	2. Time
1. Chess	2. Rook	1. Cat	2. Kitten
1. TV	2. Laptop	1. Glasses	2. Raybans
1. Car	2. Ferrari	1. Telephone	2. iPhone
1. Headphones	2. Sound	1. Crown	2. Queen
1. Hand	2. Glove	1. Saturn	2. Jupiter

Tips for students

Section 98 – EXT02 – v11

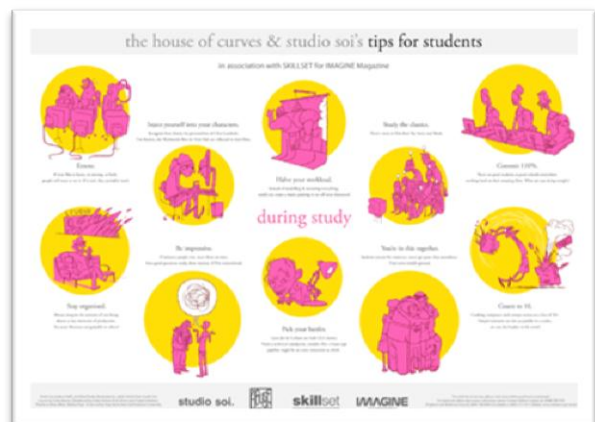
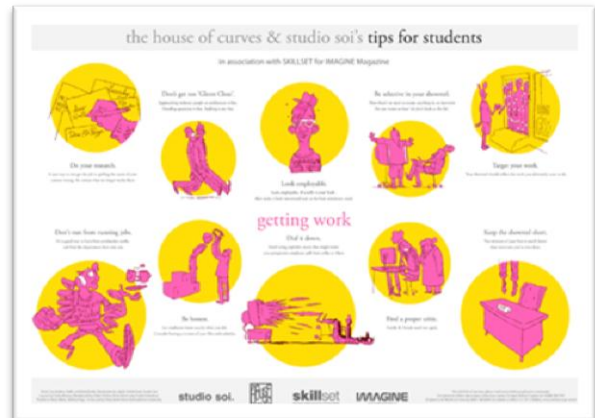
In September 2008, Imagine Magazine released our 2-sided poster, aimed at giving animation students a helping hand with their studies and some advice whilst they prepare for their careers within the industry.

We're delighted to announce that a full PDF document featuring all of the tips that were brainstormed is also completed and available in the folder.

We'd like to thank Frank Grimshaw editor of Imagine Magazine, for making us follow this through, Cathy Murray at Studio Zoo for laying out the poster in such a clear and attractive way, as well as Jakob Schuh of Studio Soi for the amazing illustrations.

Suggestions / Feedback

If you think we've left out a crucial tip that should be added to version 2.0 of our PDF or if you have any feedback/ spot any typos we'd love to hear from you. Please let us know at tips@thehouseofcurves.com



tHoC rigging road test

Section 98 – EXT03 – v02



Rigging Road Test v1.2

"Completely aside of whether a rig is animatable, has good controls and effective blendshapes, it also needs to prove itself in other ways. The rig is like a central bottleneck of the cgi process, if its inefficiently conceived it can bring a production down, and make animators and rendering TD's lives a misery. Conversely with a little prethought, it can spark the beginnings of a beautiful delivery. The points below form a simple checklist similar to car having its MOT. Once it passes, it'll be the talk of the animation department."

Andrew Daffy

MOVEMENT

Move your character by a large factor - like 10000 units in Z. Go find your character, does it still look the same? Quite often rigs tend to tear up when moved insane amounts, this can happen for many reasons, maybe your skinned character has a very small amount of unassigned weighting.

ROTATION

Rotate your character in all directions. Is it solid? Or do elbows and other ik systems spin out? Watch out for thin rope like parts of your rig too. Sometimes these things are spinning on there 'roll' axis but it can be difficult to detect until you've rendered and comped and...

SCALE

Your rigs should be scalable, but is often an afterthought. Imagine the scenario where you want your character to interact with another non scalable character. They'd never be able to.

UV SCALE (not so much rigging but good to check!)

Map a 20x20 checkerboard shader to all of the geometry that makes up your character.

Are the squares still square?

Although not essential for Zbrush user, things always end up in

Photoshop and its much easier to texture at a 1:1 scale

Is there cohesion between the objects, are the size of the squares

unified.

If someone were to map random noise, or global rust etc to your

character, would the resulting render give an even finish?

Is there UV flow over the surface of your character? Are your arm/ leg

VFX in practice

Section 98 – EXT04 – v06

"Josh meets Forrest" - 3 Days VFX-Workshop with A.Daffy- Filmakademie April 2004
(Volker Heisterberg, Markus Pflinke, Markus Schmidt, Nico Sanghrakja)




* FINAL *

tHoC printable shoot sheet and shoot checklist

Section 98 – EXT05 – v04

VFX shoot sheet # **24** Project **SOULWAX 'MACHINE'**

Storyboard Ref 20	Camera ID / Model CM1 / RED
Shot Description Camera lowers down girl	Lens Information 24mm
	One metre rule ③ 2.1m
	Camera Height ⑤ 2.5m ⑥ 1.1m
Takes / Plates without girl x2	Camera Inclination 10° down
- clean plate	Chrome Ball? YES 7 exposures
- laced off	Misc 1
- tracking marks	Misc 2


The House of Curves - VFX Shoot Sheet - v3

VFX checklist

Details

Project Name	
Contact Name	
Contact Number	
Shoot Date	
Shoot Address	

Inventory

Callsheet	Passport
D-SLR	Pillow (early morning cab)
D-SLR Memory Cards	Mobile Charger
Charged Batteries for D-SLR	Mobile Phone
Tripod	Laptop
Tape Measure	Headphones
Distometer	Notebook
Inclinometer	Sunglasses
Black & White Gaffer Tape	Pen
'Real' Reference	Chalk
Chrome Balls	Printed Shoot Sheets
Chrome Balls Mount	Clothing / Footwear for Outdoors
One Metre Measure	A Book
Misc :	Misc :
Misc :	Misc :


The House of Curves - VFX Checklist - v2

Feedback Form

Section 98 – EXT06 – v1

I'm also prepared to listen to criticism by people who say 'why do you do it like that?' or 'you should be teaching it this way'.

The techniques I write, the VFX shoot sheets I supply, and the HDRI balls I shoot with students all go towards work that I consider industry standard.

But there are obviously going to be huge fluctuations in personal and company styles.

FEEDBACK SECTION 98 - EXT06 - v1

Thanks so much for having a look at the 'Assets for Students' project. For you to get the maximum out of this resource, it would be helpful if you gave us some feedback on the Assets posted so far as well as a little information about yourself - Andrew Daffy

Name :

Company or School :

Teacher, Student or other role :

How would you describe your competency within the area of CGI?

3D Software that you're most familiar with...

What's your field of expertise / interest?

Is there a specific area of CGI Production you'd like to see covered within the Assets?

Any other thoughts?

MANY THANKS!

Please email your completed questionnaire to assets@thehouseofcurves.com

VFX Assets for Students

Section 12 – Credits

Assets development & production

The House of Curves

Andrew Daffy.

Teesside University

Christopher Wyatt & Chris Williams.

Creative Skillset

Paul Dykes, Harriet Fleuriot, Louise Franklin and Saint John Walker.

Workshop filming & photography

Family Archive Productions

Charity Onyeneho.

Workshops

Teesside University

Faculty - Mark Buschbacher (Greenscreen technician), Justin Greetham, Penny Holton, Stephen Murray, Paul Noble, Sabrina Schmid, Chris Williams and Christopher Wyatt,

Students - Sravan Chidurala, Alex Price, Sangeshwaran Sambath, Emma Sawyer, Chandrasekhar Sriramula and David Watson.

Contributors

Finish TV, Framestore, Glassworks, The Mill, Prime Focus, Studio AKA, Studio Soi and the VFX workshop students of Filmakademie.

Guest footage

Ben Palmer and Richard Tucker.

Thanks

The Animation Workshop, Sravan Chidurala, Matt Estela, Mikkel Hansen, Loretta Okoh, Shelley Page, Alex Parkinson, Joakim Pedersen, Dan Prince, Eric Riewer - Les Gobelins, Shortlist.com, Supinfocom, Film the Blanks Exercise by John Taylor and Ankit Vajpayee.