



Poser Dynamics

Part IV – In Perspective

As a decent mutual understanding is key in maintaining good relationships, I wrote **Poser Features in Perspective** to give you some historic background on various Poser functions that receive a lot of debate. Cloth Room, FireFly rendering and the evolution of the Vicky and Mike characters, for instance. Especially Poser users discussing the future might be interested in some history.

For those curious about the peculiarities of cloth simulation in general, I added **Cloth Simulation in Perspective**. It's mainly about the behavior of 3D meshes for cloth, so especially Dynamic Garment Makers (virtual tailors) might be interested.

June 2012.

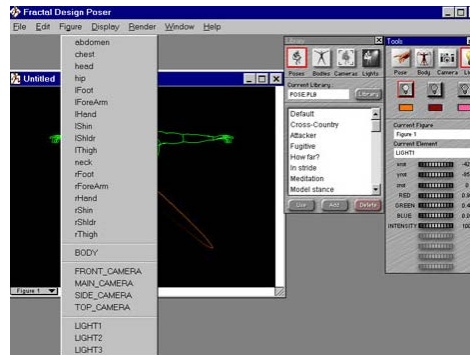
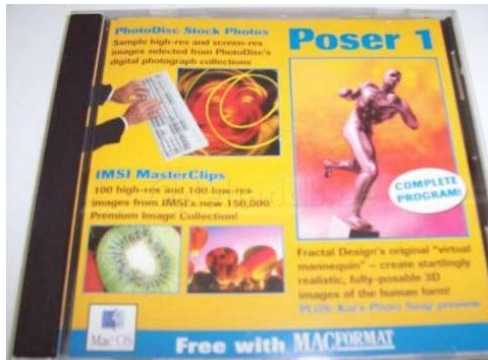
Contents

Poser features in perspective.....	3
Reyes.....	4
A view on characters.....	6
There is always more (on clothing)	7
Conclusion?.....	9
Cloth Simulation in perspective	10

Poser features in perspective

The history of Poser is rather well documented in Wikipedia. Just a brief overview:

1	1995	Fractal design	
2	1996	Fractal design	Props, Animation
3	1998	MetaCreations	User Interface (the Bryce-like), Expressions, Hand poses
4	1999	MetaCreations	Sketch render, Transparency, Conforming clothes, Magnets
ProPack	2000	Curious Labs	Python scripting, custom rigging (now: setup room)
5	2003	Curious Labs	Firefly render, Collision detection, Dynamic hair & cloth
6	2005	e-Frontier	OpenGL, IBL, Cartoon render
7	2006	e-Frontier	Talk designer, multithreading, HDRI, Morphing brush, universal poses



MetaCreations was a merger of the people from Poser, from Bryce, from Painter, from RayDream/InfiniD, from Kai's PowerTools and alike. Thanks to this, Bryce was able to handle Poser files from the early days on, and thanks to Kai Krause, they both have a similar user interface. When MetaCreations broke up, Bryce and Painter went to Corel who later

sold Bryce to DAZ. InfiniD went to Eovia to become Carrara, which later ended up at DAZ as well. The Poser people continued as Curious Labs.

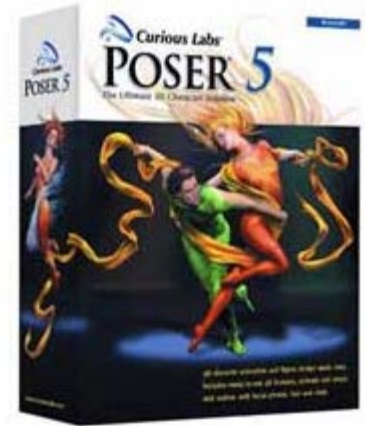
Establishing Poser 5 however turned into a sheer disaster (well described by John (Vanishing Point) Hoagland himself in <http://www.cocs.com/poser/poser5mess.htm>) and e-Frontier took over. After a while they sold their entire American branch to Smith Micro (founded by William Smith Jr). The Japanese branch is still known for the 3D modeler “Shade” and still represents the Japanese version of Poser. From then on Poser is in the hands of Smith Micro, Poser Pro gets introduced, and functionality has increased a lot since.

For a better understanding of the advanced features like Cloth Room and FireFly, it pays off to elaborate a bit on that hectic period around the turn of the century. Let’s take a look from the other side.

Reyes

In January 1996 the writer/producer Jorge Martinez Reverte, Javier Reyes and Jose Maria De Espona formed a company REM Infografica, based in Madrid, Spain. REM was the acronym of Reyes Espona Martinez. Martinez became CEO, Reyes became Technical/R&D Director and De Espona became the Art & Production director for the 3D Models Databank. (source: www.deespona.com/personalweb).

A sequence of splits and mergers (1998) moved the modelbank to Viewpoint (later: Digimation), created Next Limit (RealFlow) and also Reyes Infografica, known from 3DS Max plugins like Cloth:Reyes, Cartoon:Reyes, NPR:Reyes and more. In 2000 the latter sold its plugin technology for use in Poser. Cartoon:Reyes became Poser Toon render (the Sketch render



was already available in Poser 4), NPR:Reyes became the Poser FireFly render, Cloth:Reyes became Cloth Room and so on. Javier Reyes himself continued with Virtual Fashion, until that came to its own end as a product (say 2009).

Some background references:

- <http://www.cgarena.com/archives/interviews/3daliens/interview.html> on the foundation of Next Limit
- <http://forums.cgsociety.org/archive/index.php/t-725233.html> Reyes Infografica doing plugins for Max 2 (1998, I was into 3DS Max myself, those days).
- 3DS Max moves to Kinetix (Max 3, 1999) which then moves to Discreet (Max 4, 2000). From 2001 on, the Reyes plugins were not supported anymore
<http://forums.cgsociety.org/archive/index.php/t-725233.html>
<http://forums.cgsociety.org/archive/index.php/t-1006.html>
- 3DS MAX 5 introduced a completely renewed set of... rendering features.

So now we know where those Poser modules came from, and why creating Poser 5 took so much trouble: a lot of (Spanish?) 3DS max plugins had to be integrated in the Poser 4 framework. In the meanwhile, sometimes some confusion passes by.

The rendering module

The NPR:Reyes (NPR = Non Photoreal Render) aka FireFly render is based on the initial Renderman REYES technology, where REYES is an acronym for Render Everything Your Eyes (can) See. The Reyes from Infografica is just a normal Spanish name. In the NPR:Reyes product, the two came together.

REYES was a serious improvement over the scanline rendering (Poser 4, 3DS Max) without the enormous calculation times from the raytracers in those days, and with the ability to chop rendering tasks in pieces to support large scale projects. It did **not** support extensive raytracing (*) but offered speedy alternatives (environment mapping) instead. Later on, Pixar

enhanced the Renderman techniques by adding explicit raytracing to create their own PhotoRealistic Renderman toolkit. So it might come as a shock to you, but FireFly is not raytracing very well. By design.

(*) for the tech's amongst you: classical raytracing techniques scatter rays of light throughout the scene, and must consider the scene, and the objects, as a whole to do so. The REYES algorithm on the other hand chops a scene into chunks (buckets) and then into very tiny pieces (micropolygons) in an early stage. So both treat the scene geometry in opposite ways. As a result, REYES based renderers have problems with raytracing, and raytracing renderers have problems with performance.

A view on characters

So, the introduction of Poser 5 was a milestone in its history, and a heavy one. Next to the software and its functions, it had impact on content and future developments as well. Up till then, DAZ had created the Vicky and Mike characters (versions 1 and 2) based on the P4 female and male, which as such were Zygote products. The turnover to Poser 5 brought some serious licensing issues between MetaCreations and DAZ, and the latter decided to go their own way.

This own way introduced the unimesh geometry, the wish to create all characters from one single mesh. Vicky and Mike 3 introduced that concept, soon to be followed by Stephanie 3 which was a real-person body scan translated to the unimesh. DAZ also had their own view on the software, which brought us Daz Studio consisting of a free base with paid plugins—just a completely different marketing concept compared to Poser.

Boths DAZ views developed, and after a successful rebuild of Vick and Mike 4 using the new modo modeler, and after successfully turning Girl 4, Steph 4 and so on into morphs of Vicky's mesh, DAZ launched Genesis—the new generation unimesh, with all known figures (Vick and Mike 5 included) provided as morphs of that base mesh, and including a serious Poser contender Daz Studio 4, at the turn of 2011/2012. The weight-mapping mechanisms for smoother posing forced Smith Micro into similar features for Poser 9/ Pro 2012. But mainly, the full features of the new DAZ characters could not

be deployed in Poser at the fullest, you needed DS4 for that.

This came as a serious chock to the Poser community. Being “Poser-compatible” was not the default anymore.

There is always more (on clothing)

Around the turn of the century, Serge Marck published his site www.poserfashion.net. He published clothes for Poser 4 (conforming), Poser 5 (some dynamic for V3) and Poser 6 (dynamic, V4). He was into cloth simulation for some time already, and discussed SimCloth, Cloth:Reyes, ClothFX and Maya/Cloth. Apparently the relevant products in those days.

SimCloth is still around as a Max plugin. It's opensource, so just go <http://www.spot3d.com/simcloth/> and get the code, if you like. That is, if you want to find out about the internals. It's created by Vladimir Koylazov (Vlado) in 2000 – 2002, and got a serious update in 2005. Vlado himself works at the Chaos Group, home of the V-Ray renderer. Small world.

ClothFX is announced (Jan 2004, www.thefreelibrary.com) as “the” cloth simulator for 3DS MAX, and referred to as the new name for Stitch. This one gets a Stitch Lite equivalent “compatible to Max4, Max5 and Stitch” (Feb 2003) and owned by Digimation. Didn't they get the REM Infografica Modelbank also? During the issue of 3DS Max 7, ClothFX was distributed for free and since Max 8 it's part of the program stack. According to the current 3Ds Max manuals, ClothFX is a trademark from Size8 software. Their single page website refers to TurboSquid where the free ClothFX was distributed.

Cloth:Reyes ended up in Poser Cloth Room. According to the credits for Poser, the cloth simulation was written by Size8 Software also. Note that Virtual Fashion was a garment maker, like Marvelous Designer. Note that ClothFX introduced a garment maker into 3DS Max. And Poser got the simulation part only, and lacks a garment maker.

According to various posts on the net, and forum posts in CGSociety, debates around REM Infografica and Reyes Infografica were around patents on fluid and cloth dynamics. Apparently, not all the clothing guys went with Javier Reyes... perhaps Size8 is just another part of that original team. We'll never know.

In the meantime, life goes on and so does cloth simulation. Halfway 2012 I found:

- Kinect Virtual Fashion – by MicroSoft. It uses MS Kinect / XBOX to measure up your body, and then you can dress up virtually. On Youtube: <http://www.youtube.com/watch?v=s0Fn6PyfJ0I>
- Cisco StyleMe Virtual Fashion Mirror, does about the same in retail environments, it's a shopping business product
- ImageTwin, <http://www.imagetwinsolutions.com/Kinect/> - use Kinect to obtain your body shape.
- TC2, www.tc2.com - the guys behind the body scan technology



Now, given the body scan thing, where do you think that Virtual Fashion clothing comes from, since Javier Reyes teamed up with MicroSoft in various fashion conferences, and the software disappeared from the consumers software market in 2009?

Conclusion?

Now perhaps we can appreciate why FireFly is not that good in raytracing, and is very unlikely to become so in the near future. Till then we have to manage with translators (like Pose2Lux, or a Reality plugin for Poser perhaps?) into third party raytracers like LuxRender.

We also can appreciate why Cloth Room is very unlikely to undergo any drastic transformations. Till then we have to manage with a decent understanding of the tools at hand.

We also can appreciate why DAZ is demonstrating that Poser-compatibility is not an industry standard any more.

And finally, let's not point at Smith Micro for the things they just inherited a few years ago.

Cloth Simulation in perspective

When I started to Google on cloth simulation, I stumbled into

<http://www.animares.com/book/Secondary-Motion/Cloth/Hintergrund.html>.

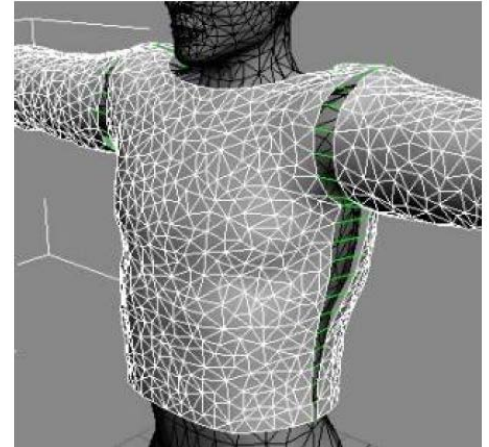
Its in German, on issues with cloth simulation. The page mainly noted to watch out for parameter settings, conversion and scale.

In short, if the parameters are determined for seconds, meters, kilograms etc and the mesh is defined in inches or internal (poser) units, then you're off. I'll let this alone, the Poser parameters are in semi-metrics (cm, s, gram), and I already mentioned the gravity matching the Earth surface conditions. Every now and then in this tutorial you'll see me juggle to end up right. But for users of Imperial units (inches etc) there is a health warning in here: watch your units.

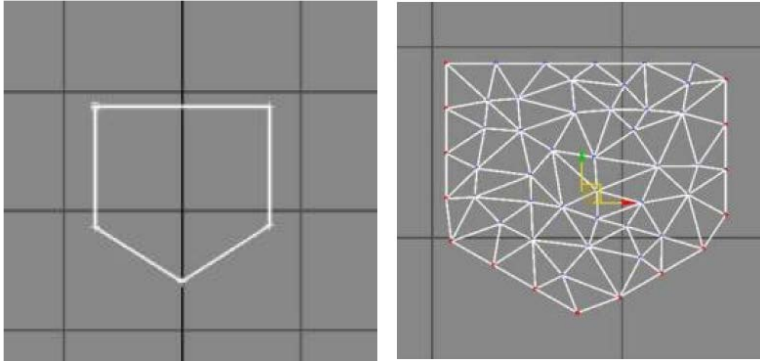
Also, cloth in real life does not scale, and neither do cloth simulators. Sheets of 1x1 mm, 1x1 mtr and 1x1 km really do behave different. Thread thickness plays a role, and so does the thread pulling strength and loads. You cannot fold the 1x1mm piece, and a 1km fibre will break under its own weight. Things like that.

The webpage also noted that although regular meshes do fine in most areas of 3D, cloth simulation is not one of them. Cloth Simulation benefits from a "Delaunay-Method" which gives irregular triangulation of meshes. It's implemented in Sim Cloth / Clothmesh, in Cloth Reyes / Hexamesh, in ClothFX / Cloth Panel and in Maya / Cloth. So they said. A familiar collection.

Since ClothFX ended up in 3DSMax (see **Poser feautures in perspective**) it's the Hair&Cloth chapter from 3DSMax that presents clear examples. With a few splines the contours of a garment are defined, and the Garment Maker creates the irregular mesh from it. For a shirt in development:



And for a pocket attached to it (just to illustrate what an irregular mesh looks like):



Since ClothReyes is implemented as Poser Cloth Room, let's see what we can find out. Google is our friend.

Well, I end up at a program called Virtual Fashion (Pro 1.5), available in Spanish and English, July 2009, with the ability to export Quad and Hexa Meshes to Poser. Doesn't it sound familiar (**Poser features in perspective**)?

A Mesh/Garment Maker apparently was not included when Cloth:Reyes was included into Poser, I can't see it different. Poser got the simulator only.

In the meantime, Hexamesh itself is a toolkit doing fine in CAD/CAM environments, like the fabrication of (e.g. medical) components – which is not on our route.

I'm presenting this meshing story, because simulation results appear to be dependent on mesh structures and people ask (in forums etc) about "best mesh structures" and "what to do with existing mesh files". We don't need to re-invent wheels here. At least a serious part of this tutorial is devoted to mesh structures.

So I might need a tool to turn regular (quad, tri, ...) meshes into irregular ones.

Since people are fond of Marvelous Designer as a cloth making toolkit, the Show Mesh example in the manual shows:



That's not just simple triangles, that's Delaunay Triangulation. Don't look further!

I continued my strolling around the Net and in the end I found myself buried deep down in a worldwide scientific community on cloth simulation, US patents included, which evolved from about the mid '80s. That was about the moment I stopped in the scientific arena after getting my MSc on applied math and experimental physics. I never looked back. This means to me that I will stop looking further into this area on the vertex level. Back to the front! Let's make fun images. But I'll give you what I found on the ways forth and back.

From www.poserfashion.net I learned that the author (Serge Marck) was into cloth sim long before Poser started doing it. He states that all cloth sim routines (those days) were based on the modeling of physical fibre behaviour in cloth. He also flagged and demonstrated that because of this modeling, the simulation results depend on non-virtual things as real world cloth size and structure. In effect, he showed differences (from Cloth Room) based on cloth size at constant vertex density, on vertex density at constant cloth size, and on mesh type (quad vs tris) at constant density and size.

His main source was a tutorial by P.S. Karthikeyan. It's nowhere nowadays, I only could find a Russian translation of one chapter out of it (Google Translate is my friend too), on the modeling fundamentals. This said that all started in the '80s from the well understood behaviour of cables (hanging bridges, telegraph cables) and the effects of fibre parameters, the effects of fibre thickness on those parameters, and the effects of gravity and wind. Cloth then is interpreted as a two-way weave of cloth fibres each described with cable behaviour.

It also said that - at those days - P.S. Karthikeyan was a 3rd year student on the Aerospace Institute in Madras, India. I did not find any other references to him related to cloth sim, after that. But I did find that the tutorial must have been very good, because it's quoted in about every paper on this matter from those days on. Google rocks.

One of the papers I ran into looked worth downloading and sharing, it looked readable, an overview on fundamentals and implementations in the popular cloth sim software mentioned above and in various forum posts. Recommended.

Researchpaper “**Manasilib**” can be downloaded from the website as well, as it seems to be disappeared from its original location. This original location is the RISC – Research Institute for Symbolic Computation, deep down the science dungeons. Get me out!

With respect to all of this, Cloth Room definitely is a different beast than Materials Room or alike. It's not a Room at all, it's the Magic Kingdom Castle, or the complete Disneyland Park around it. I'm going back to the front gate. See you there.