

# TOP 20 3D PRINTING STORIES

2014

PRESENTED BY



**sculpteo**

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# SMALL SERIES MANUFACTURING

3D printing now offers a viable alternative to **costly injection molding** that require long preparation and implementation periods. With 3D printing, an idea can be shipped and ready for commercial use within a matter of days, a process that once took months to accomplish.

It marks an exciting moment for manufacturing at every level of the process. 3D designs can be market tested as parts (or entire objects) can be printed and reinterpreted at a smaller scale than is necessary to be cost effective through the injection molding process.

3D printing also allows for more complex designs to be carried out than would be accomplished through injection molding. (For more information on the differences between 3D printing and injection molding, take a look at our ebook comparing 3D printing with injection molding.) Both interlocking and interlacing designs are able to made as a result of SLS printing at Sculpteo. Other printing process allow for full color designs, though, with small series prints made through Sculpteo, our plastic Nylon is most common.

Some particularly exciting projects that passed through Sculpteo include the NightHawk by Audioquest, Pierro Astro and ALB Watches. They greatly helped to push 3D printing from just a manner of prototyping into a viable solution for series prints.

# NIGHTHAWK BY AUDIOQUEST

AudioQuest is changing our idea of what it means to manufacture with 3D Printing and Sculpteo's services. It's no surprise they have been named a 2015 CES Innovation Awards Honoree (Headphones) and Winner (Eco-Design & Sustainable Technologies). NightHawk, AudioQuest's first headphone, is also the first mass-produced headphone to include a 3D-printed part in the design. With 3D printing, AudioQuest was able to create parts with a complexity unachievable through traditional manufacturing means. We got the chance to meet Skylar Gray, Designer and Director of Ear-Speaker Products at AudioQuest who explained how Sculpteo and 3D Printing played a key role in the making of their headphones.



NightHawk's sound quality would not be the same without the 3D-printed parts. A complex biomimetic grille diffuses unwanted sound and defeats the resonances that ultimately distort and damage music quality. The design is inspired by the underlying structure of butterfly wings which diffuse light (as opposed to sound in the case of the NightHawk), leaving a visually beautiful and functional latticework. Such complexity would be impossible to achieve through traditional manufacturing needs, so AudioQuest reached out to Sculpteo in order to produce the part.



The piece was produced in our Plastic Material. The material is a variant of Nylon, which begins as powder and is then melted in a series of layers to create the final object. The technical name for this process is Selective Laser Sintering (SLS). This process allows for much greater freedom in terms of design, which AudioQuest took full advantage of.

Skylar Gray further explains how crucial 3D Printing is for their new headphone:  
"A grille like NightHawk's, with its intricate diamond cubic latticework, couldn't have been made five years ago. The only way it could be created is through today's advanced 3D printing. So, from the very start, we intended for NightHawk's grille to be 3D printed. Designing with 3D printing in mind is quite liberating

because there are far fewer restrictions and boundaries, enabling otherwise impossible forms and complexity. Without Sculpteo's expert help, we simply wouldn't have been able to produce as compelling a product. We are very thankful for Sculpteo's support and excellent work."

As Gray states, designs of this complexity would not have been possible in the past. Injection molds, for example, do not allow for complete freedom of design. Our plastic material is not restricted by the process of fabrication. SLS allows for interlocking, movable, or even (as is the case with Audio-Quest) complex diamond lattices.



When producing an object at such a high quantity, each of the material's qualities had to be taken into consideration. The part, weighing in at about 0.9 g/cm<sup>3</sup>, allowed for a piece that was not going to weigh down the headphone. Besides the finishes and dyeing available through Sculpteo's services, other finishes can be applied to pieces, such as gloss painting, and others. Thanks to that, they could get a great-looking part.

This marks the beginning of an exciting time in both design and manufacturing for products across all industries. Designs are no longer restricted and reinterpreted by injection molding specialists; they can now be conceived and realized exactly as the product developers might imagine. Including for mass production, in AudioQuest's case. 3D Printing is no longer confined to rapid prototyping; it is an economically viable option for both short-series and large-scale manufacturing jobs. And Sculpteo can be even more interesting for small batches - a production of at least 10 units will activate special reductions and more finishing options.

We here at Sculpteo are excited for AudioQuest's NightHawk to be released in 2015 and for what the headphones mean for 3D printing and manufacturing.

# ALB WATCHES

**Several years ago, the designers of the French Brand ALB Watches decided to meet a challenge. They wanted to mix traditional craftsmanship, and modern technologies in order to design their luxury watches. Now all of their products integrate 3D printed components, printed through Sculpteo's services.**



From the beginning, Vincent Candellé-Tuheille and Simon-Pierre Delord, founders of the brand, had the same approach:

“ We wanted to create upmarket designs, using high quality components, such as Swiss movement, or great quality interlocking parts. It was essential to find a harmonization between art, craft and technology. The brand universe gradually found its way, but 3D printing quickly became an obvious choice”.

Having both 3D modeling background, the designers knew it offers great liberty of creation. Which was essential for their watches. As Simon-Pierre Delord explained us, “ALB’s main goal was to create a space in the watches dedicated to personal expression, that would allow us to tell stories”. What better way to achieve it than 3D printing?

“ 3D printing allows us to model up, and work the matter without constraints. We’ve been seduced by the materials Sculpteo offers, by their originality, their texture and their properties. For example, we could develop a new painting process which would allowing us to create a good looking impression of volume. That’s how we started working with Sculpteo coming up with multiple tests. Sculpteo’s team helped us to utilize all of the subtleties and potential of 3D printing.”



Now, they use 3D printed components to produce all of their watches. “It became so essential in the way we design our watches that we can’t imagine of using another technology.” Their mission is accomplished for sure since all the parts are entirely hand-assembled.

# PIERRO ASTRO

**Astronomy isn't just for research centers. There are thousands passionate amateur astronomers, who are looking for high quality stargazing equipment. That's where Pierro Astro comes in. This France-based company offers and develops on demand products to simplify astronomy. Since most of their products meet very specific needs, 3D printing and Sculpteo's services were the best solution to produce peculiar pieces. Discover their story.**



Pierro Astro has been offering their products for about 10 years now. We got a chance to meet up with Pierre Franquet, CEO of Pierro Astro, who explained the company's strategy, "We produce and sell telescopes, astronomic glasses and accessories that allow users to observe and take pictures of planets, stars, nebulas and galaxies". They're more than an astronomy shop, they're an astronomy experience: they only offer products they personally have tested and enjoyed using. That means each of their products are quality assured. They then use those products to develop new and innovative equipment, generally based in IT solutions or electronics.

Pierro Astro was quickly taken with 3D printing and Sculpteo's services: "The first time we used additive manufacturing, we were working on a high precision focus Cassegrain reflector. The quality of the 3D printed components was perfect for our product".



3D Printing is the best solution to produce small batches of pieces, that are both functional and affordable. In fact, it's easy to manufacture just one unit while using additive manufacturing, whereas plastic molding requires to produce a large quantity of units to become financially attractive.

Sculpteo's Batch Control tool is exactly what companies such as Pierro Astro need. Above all, it is the best way to reduce the unit price; with a reduction

range up to 80% when the Batch Control tool is activated. That's what allowed Pierro Astro's to make affordable solutions for amateurs.

Sculpteo's Batch Control tool even unlocks additional options when it comes to your 3D prints : you can choose more precise printing definition, and also polished finishes. Therefore, it's easy to conceive, prototype, and test the product in a really effective way. It takes a few weeks to develop a new solution with 3D Printing, whereas traditional manufacturing requires months, and far bigger expenses.

The materials and finishing options available through Sculpteo played another important role for Pierro Astro when they were deciding which 3D printing service to choose. Our plastic material, was the best option for their particular needs. With faster production times, a cheaper price tag, great mechanical qualities, and a beautiful surface look, polyamide proved to be the best option for their project.

For some further specifics on the material, polyamide is made from a nylon powder, which is sintered together layer by layer in a process called Selective Laser Sintering or SLS. Our 3D printers, EOS Formiga P100, P110, P395, and P730, are extremely accurate with a layer precision of between 100 or 60  $\mu\text{m}$ . The 60 $\mu\text{m}$  option becomes available when Batch Control is activated.

As Pierro Astro explains, once you have tried it, it's hard to go back to traditional manufacturing. "It's our first try with 3D Printing, but we have many more projects to come using this revolutionary producing method".



# DRINKMATE

**It is an exciting time in the startup world! Nearly every day a record breaking crowdfunding campaign catches the attention of the world with new devices that meld the worlds of software with hardware. And one key player in this (r)evolution is 3D printing. The DrinkMate project is one of those projects and thanks to Sculpteo's services, DrinkMate's team has been able to prototype, manufacture and ship at a reasonable budget for a small company. After 3 days on Kickstarter, the project has already reached a quarter of the final goal pledge. We met, Shaun Masavage, the entrepreneur behind this great project.**



Be safe and make the right decisions. That's the inspiration behind DrinkMate, a new and convenient way to be responsible while having fun. This Breathalyzer is the smallest one you could ever find, and it directly plugs into your smartphone to display your Blood Alcohol Content (BAC).

Two people have been involved in this adventure: Shaun Masavage, an Electromechanical Engineer who devised the hardware (at the right), and Mack Redding, another engineer who was in charge of creating Drinkmate's app (at the left).

To be able to design such a small breathalyzer, its creators had to start from scratch. Shaun explains:



"We knew that to make a new breakthrough in size reduction, we couldn't have any bias from existing larger designs".

That's how they ended up with a prototype, smaller than any lipstick, and that fits in all pockets. But a lot of work still had to be done:

"I'm a hardware guy and creating dazzling prototypes for ideas is in my DNA. However, the steps afterwards, are not trivial by any means. The gap between prototype and product is immense, intimidating, and stops

the overwhelming majority of inventors from bringing their ideas to market."

“The solution: Sculpteo 3D printed enclosures. The prints were dimensionally accurate enough to drop my circuit board right inside with no wiggle room whatsoever! I then snapped the two pieces together, popped the cap on, and threw a label on the side. Voilà!

“Sculpteo even offered Batch printing for my final round of 40 samples where the unit cost dropped by almost 70% each.

“Thanks to 3D Printing and Sculpteo’s services, bootstrapped aspiring entrepreneurs such as myself are able to turn their ideas into reality.”



# BLUEBEE

**In 2008, a pair of engineering students had a habit of losing keys. After multiple lock changes, they decided to design something about it – a small device that can be attached to keys or left in a wallet that alerts you of its whereabouts. Now the device is available to everyone through BlueBee.**



We've all been there: a night of merrymaking and a cab ride home only to be left at your doorstep in the rain wondering, "Shoot, did I leave my keys in the cab? At the restaurant?" Well now BlueBee has the answer.

BlueBee is a startup with infinite growth possibilities, as key-losing is a worldwide epidemic. But as they are still a small business, Rodionov writes of the advantages of 3D prototyping on a tighter scale. "3D printing is an obvious solution for a start-up, especially if you follow the 'lean start-up' approach. It allows you to cut time and resources on prototyping, and thus to achieve a minimum viable product in no time."

During the design and manufacturing process, Rodionov had many production options, including injection molding, though he warns against it, especially for small businesses:

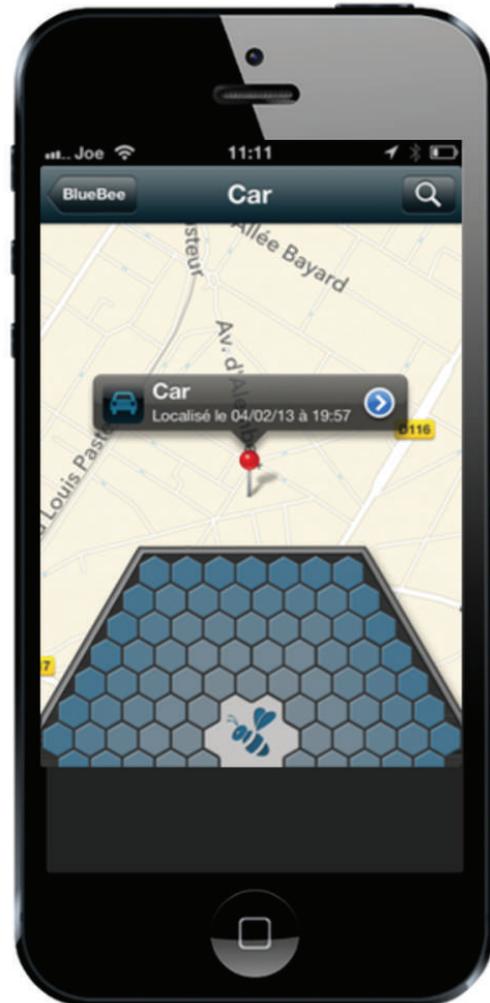
"Instead of using 3D printing, we could have gone for a mold. In fact that's what we did for our first product and this didn't work out that well. Once you have ordered a mold, there is no way back and no room for changes. After producing and distributing a first series of the molded BlueBees, clients started telling us about all the little changes in product design which in their opinion would make it better. But there were nothing we could do about it but to wait for month until the second version of the product was fully ready."



"The solution: Sculpteo 3D printed enclosures. The prints were dimensionally accurate enough to drop my circuit board right inside with no wiggle room whatsoever! I then snapped the two pieces together, popped the cap on, and threw a label on the side. Voilà!

"Sculpteo even offered Batch printing for my final round of 40 samples where the unit cost dropped by almost 70% each.

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# HEXADRONE

**It's well known that drones and 3D printing definitely make a good pair. Additive manufacturing technologies allow droning professionals and hobbyists to build their own aircraft. With today's technology, drones can perfectly match their owner's needs. We met up with Alexandre Labesse, CEO at Hexadrone, to get his views on the influence of 3D printing in the industry.**



Based in France, Hexadrone is a mechatronic company, as Alexandre Labesse explained to us. "We build officially authorized drones, and offer our services for filming TV shows, advertisements, and movies as well.

"The electronic parts come from general public components e.g. motors, flight indicators. However, all the components of the chassis are entirely created and assembled in our workshops. One of our main goals is to have a perfect command of our machines, which means we have to fully design and create basket and hull components."

Anyone who designs filming drones face many constraints regarding weight, volume, carrying capacity, and conformity to official requirements.



To be authorized to fly in town, drones have to be lighter than 4 kilograms, and must be equipped with a parachute. That may be an issue in producing some droning solutions: "it is essential for us to keep a stable and fluid image, but all of the existing solutions to take on board a high quality movie camera were far too heavy.

We chose to conceive our own made to measure structure."

In order to create their own structure, Hexadrone thus needed a really light material. Our polyamide material was perfect for that. Weighting about 0,9 g/ cm<sup>3</sup>, it allowed them to conceive a solution which is light and looks good. Thanks to the SLS process, printed on our OS Formiga P100, P110, P395, and P730, they could create high precision parts. The printing precision is indeed of 100 µm, and it even reaches 60 µm when Batch Control is activated.



Sculpteo's plastic material also allow them to create complicated designs Hexadrone wouldn't have been able to produce without additive manufacturing. The 3D printed pieces are also extremely resistant and stiff enough to fit needs.

Sculpteo's services quickly became the best choice for Hexadrone.

"We'd been making our pieces through traditional manufacturing so far, at much higher costs and longer waiting time. When we discovered 3D printing, we were convinced at once.

"Thanks to 3D printing, pieces are really quickly available, which means we can test them within a few days, and make changes reactively.

Hexadrone has now succeeded in launching one of the market's lightest baskets for high quality filming for drones. They have ordered a serie of prints to meet the increasing demand.

They are now developing many projects with Sculpteo's 3D printing solution, also including pilots' and cameramen's accessories.

# OPENQCM

**Open Source projects are all the rage nowadays, just like 3D Printing. OpenQCM is the first scientific scale, to fully utilize the open source revolution. For the project to fully capitalize on open sourcery it needed to first be universally accessible – and 3D printing has made it a possible. It has given the scientific community free access to 3D files and top-notch print accuracy. We had the chance to meet with Dr. Raffaele Battaglia, who came back to how 3D Printing played a key role in the prototyping and the production of openQCM.**



When Novaetech designed openQCM, they had a precise idea in mind: they wanted to create a scientific scale based on Open Sourced works. As Raffaele explains, “openQCM concept is inspired by the emerging movement of the open source hardware. It means that openQCM is a hardware whose design is made publicly available, in such a way that everyone can study, modify and distribute the hardware based on that design.”

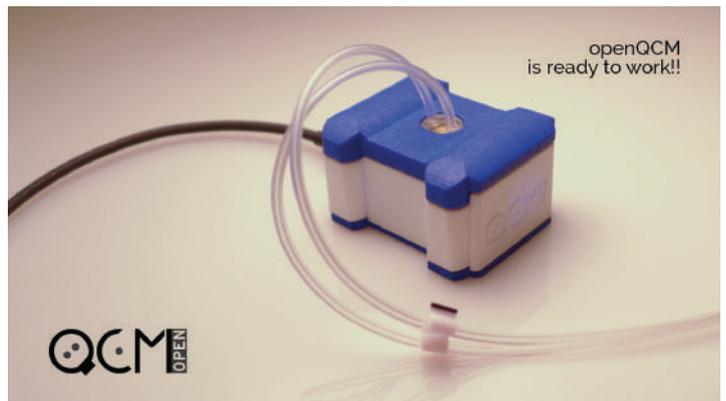
Novaetech is a Spin-off Company of the National Institute for Astrophysics (INAF). As Mr. Battaglia explains, “OpenQCM is a scientific instrument whose core is a quartz crystal microbalance, that is a high sensitive device for weighing mass at molecular scale. It is capable of measuring mass deposition down to 1 billionth of grams. It has a wide range of applications, from chemical and biological sensing to material science”. It means they’re used to work with major actors from the scientific world, including the Rosetta Mission. Novaetech also join the international LANDS team for the analysis of cometary dust sample collected by space probe NASA STARDUST.



Thus, their device had to be precise enough for all the concerned fields of science. That’s why they chose our white plastic material. Thanks to the SLS process, printed on our OS Formiga P100, P110, P395, and P730, they could create high precision parts. The printing precision is indeed of 100  $\mu\text{m}$ , and it even reaches 60  $\mu\text{m}$  when Batch Control is activated.

Sculpteo's services were also perfect for their Open Source works. Thanks to our 3D Printing Cloud Engine, anyone interested in the project can easily order its own 3D Print, even if they don't have a 3D Printer. All they have to do is upload the 3D file on Sculpteo.com, choose the right size and material, and voilà! They will receive their 3D print within a week (in the case of plastic material).

The 3D printing technology offers the possibility to manufacture the hardware at low cost and high quality. Their designer, Glenda Torres Guizado, was aware of that, having used 3D Printing more than once. As Raffaele Battaglia explains, "Thanks to Sculpteo we realized the first prototype of openQCM and it is really awesome. 3D Printing now stands out as the only possible solution to make their project come true."



# RAPID PROTOTYPING

For the majority of 3D printing's history, it has been most commonly used for rapid prototyping. With the quick turn around times that 3D printing offers, designs can be taken and tweaked to the whims of the designers and the customers without much overhead cost or lost time.

The prototypes produced through Sculpteo's services range in size from 56.5 cm to just millimeters. And at any size, our details are particularly fine, given layer thicknesses of down to 20 micrometers. Even larger and finer details can be attained through various post-processing techniques, which can make each prototype comparable to the final object.

Some of the most exciting projects that came through our services include a prototype of the Merveille at Mont St. Michel and working with the CNES (French National Center for Space Research) in creating a 3D printed replica of the comet-destination of the Rosetta Mission.

3D printing, particularly through the SLS processes available through Sculpteo offer the highest and fastest quality plastics that can be attained, when attempting to emulate an object through a prototype.

# MERVEILLE AT MONT ST. MICHEL

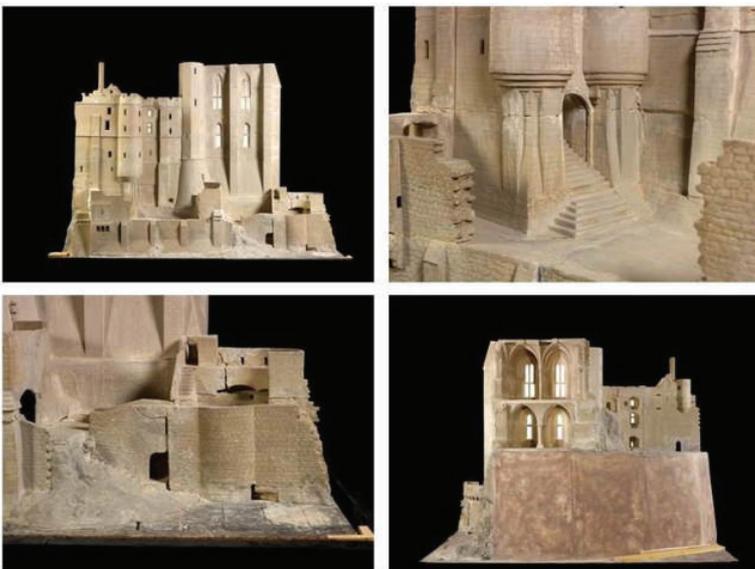
The Cité de L'Architecture, Paris' premier architecture museum located just across from the Eiffel Tower, recently announced a revolutionary project that connects medieval architectural modeling methods with the most cutting edge 3D modeling techniques. Sculpteo offering their 3D viewer and an updated mock-up of the object, teamed with the Cité in hopes to Restore the Merveille of Mont St Michel.



Mont St Michel gives name to an island commune and architecturally brilliant Abbey that lie about 220 miles west of Paris off of the Atlantic coast of France. Each day rising and setting tides surround the island, offering views that few pictures can do justice.

The Merveille is where monks once lived in the Abbey. A model of the The Merveille was created around 1880 to explain and support Jules-Edouard Corroyer, the architect in charge of the Mont St Michel's restoration. The model stands about 8.5 feet (2,60m) tall and was made from a single block of stone. Unfortunately, time and voyages (at one point the top portion of the model needed to be removed to fit through a doorway) have weathered the model.

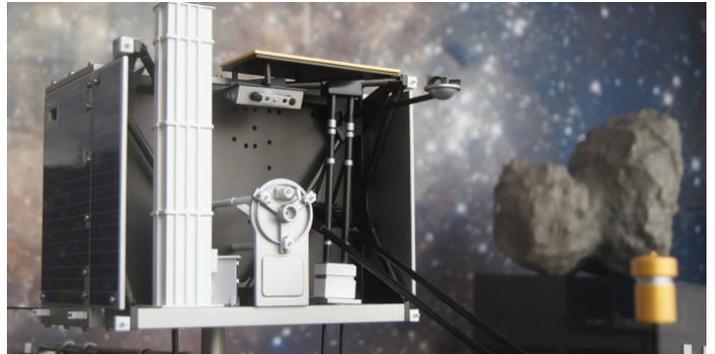
The architectural, stone model has found its way to The Cité de L'Architecture, who are now looking to restore it. With the help of Sculpteo, they have launched their Ulule campaign to restore the model to its former glory.



The structure had multiple 3D scans that were funded directly by Sculpteo. Those scans interpreted every interior aspect of the structure, including textures and colors. The scan was then sent to one of Sculpteo's lead 3D designers, Alvis Rizzo, who after a series of 3D scans of the stone model, Sculpteo managed to recreate a printable model of the object in 3D. You can see Sculpteo's 3D viewer in use on the Ulule page (and below). A 3D model is an essential part of the process to give donors an impression of what they are donating to reestablish. In particular, donors of 1000€ or more will get a miniature of the structure, printed in 3D from Sculpteo.

# ROSETTA MISSION

**The Rosetta spacecraft was launched in 2004, with the intent to give the most in depth understanding of a comet that humanity has to date. Last August, the spacecraft became the first to successfully rendezvous with a comet with the intent to orbit. Now its time for the spacecraft's robotic lander, Philae, to make its descent and Sculpteo's 3D printing services are helping in the process.**



The Rosetta project was born more than 20 years ago, when the European Space Agency (ESA) decided to launch a study of a comet. Eventually they chose 67P/Churyumov–Gerasimenko (67P/C-G). It marked the beginning of the most ambitious study of a comet to date.

For an impression of the scale, the comet is 4.5 x 4.1 km across and the Rosetta spacecraft is only 2.8 x 2.1 x 2.0 m in size. Relatively, the mission is like throwing a pen-tip at a golf ball on Mars.

Last August, after ten years in space (including a close flyby of Mars) the spacecraft managed to arrive and successfully orbit the comet — now its time to land. First, however, the ESA needs to find a safe landing zone for the spacecraft's robotic lander, Philae (named after Philae Island, where an obelisk was found and used in addition to the Rosetta stone to decipher Egyptian hieroglyphics).

As the Rosetta spacecraft orbits, it takes pictures of the comet. Those pictures were used to reconstruct a 3D model of the comet, which only helps so much when visualizing a landing point.



“Having a physical object in our hands, to hold, observe and show definitely helped us make our decision. Even if you have a good imagination, it’s always easier to plan the journey when you have the 3D print on hand,” Philippe Gaudon, Centre National d’Etudes Spatiales (CNES) Project Manager of the Rosetta mission, explains. “The public gets a better understanding of the project with a 3D print, the project becomes concrete.”

The CNES, France's contribution to the ESA, took the 3D model created through the spacecraft's photographs and ordered multiple prints through Sculpteo's website.



Thanks to our plastic material, it was also possible to color it afterward. In fact, any Sculpteo's white plastic printed object can be colored. Whether you choose to buy a dyed version of your model, or you hand paint it by yourself, it's really easy to come with a nice coloring for your polyamid 3D prints.

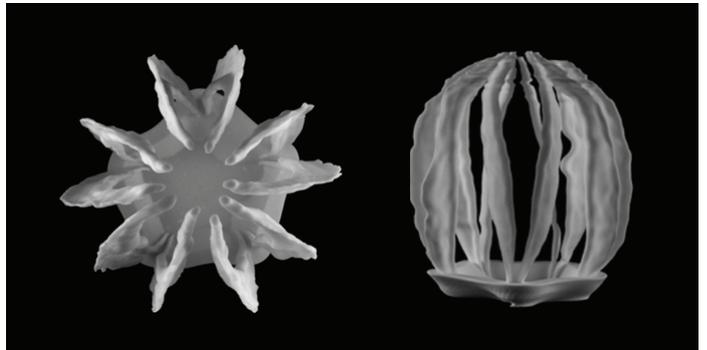
This was Gaudon's first experience with 3D printing, though hopefully not the last for him and the CNES. "Even though I heard a lot about 3D printing, I had never seen a 3D print with my own eyes. I'm really satisfied with the finale version we got from Sculpteo," he explains.

"Several years ago, when we scanned Steins and Lutetia asteroids, we ordered physical versions of it made through manual plaster molding. But it was definitely less precise than the print we got for 67P/Churymov-Gerasimenko. It was also a lot faster: we got the print exactly one week after we uploaded it on Sculpteo's website" told us Philippe Gaudon.

After the replication of the comet through 3D printing, the potential landing sites have been narrowed down to just two. We're looking forward to the final decision and the eventual landing of the Philae.

# ASSEMBLING THE ECHINODERM OF LIFE

**A team headed by Dr Johnny Waters out of Appalachian State University has been working on Assembling the Echinoderm of Life (AEToL), a project funded by the National Science Foundation. We got a chance to speak with Dr Waters and Lyndsie White, the head Industrial Designer, to see how 3D printing fits in with highly detailed academic projects.**

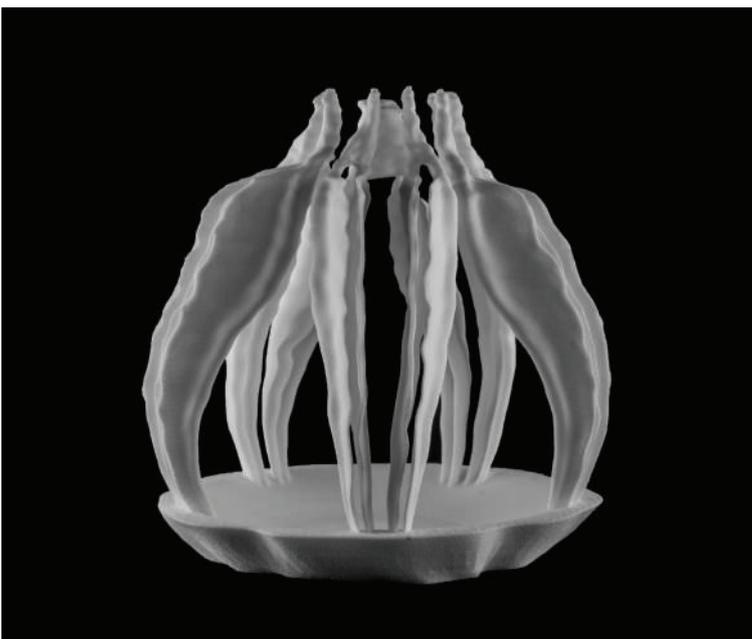


Before diving into the specifics of the project, it may help to know what exactly an echinoderm is.

In short, any starfish, sand dollar, sand cucumber, and sea urchin is an echinoderm. There are just five different classes of echinoderm living in the ocean today and over 20 classes have gone extinct. AEToL aims to get a better understanding of those lost classes with 3D printing and modeling, while also giving collegiate undergraduates the chance to train with real world projects.

Lyndsie White is one of those undergraduates getting the chance to work on the project. In her report *Pushing the Limits on Visualization* she explains the process of taking the fossil of an extinct animal and recreating it using modern manufacturing.

First the data set was gathered using acetate peels of the fossil. “The peels are created by physically grinding away material from the specimen in order to record two-dimensional parallel slices,” White explains in her report. In other words, the fossil is ground down layer by layer to get a digital file, in many ways opposite to the way 3D printing works (building up an object layer by layer for a physical object).



White was then able to take the digital files and recreate a digital model of the fossil using Adobe Photoshop. From there she was able to make a detailed drawing of the object and highlight points of interest, “However studying two dimensional slices becomes a poor comparison to what three dimensional visualization can offer,” she explains. She was then able to take the various digital layers and create three dimensional files using Rhinoceros 3D and Adobe Illustrator. Modeling in Rhino gave her the ability to create interactive and editable models, “creating thousands of problem solving techniques and higher quality visualizations,” she further explains.

Sculpteo was then able to take the files White created through Rhino and print them with exceptional accuracy. Dr Waters explains, "Our models are very complex with some very thin edges (~0.5 mm) that are critical in our interpretation. Sculpteo was able to print most of our models with no difficulty. The response to the models at scientific meetings has been very positive!"

# HYGROUND TILES

Wait, but what is HyGround? Well as the creator and visionary of the company, Bill Reaser, puts it, "we create 3 dimensional gaming worlds. There is no mass producer of 3D Terrain any-more now that Heroscape has been discontinued. We are filling the void with providing a nicely detailed, high quality, affordable game board system."



There are hundreds of miniature skirmish games out there, but as the HyGround team saw that there was a serious lack of high quality gaming boards to play them on. Reaser goes on to explain, "The board is hugely important for skirmish games. The problem is that most game manufacturers don't provide a good 3D board with their games. They provide roll-up or printed chip boards (some more elaborate) all while providing some of the coolest 3D miniatures you can imagine."

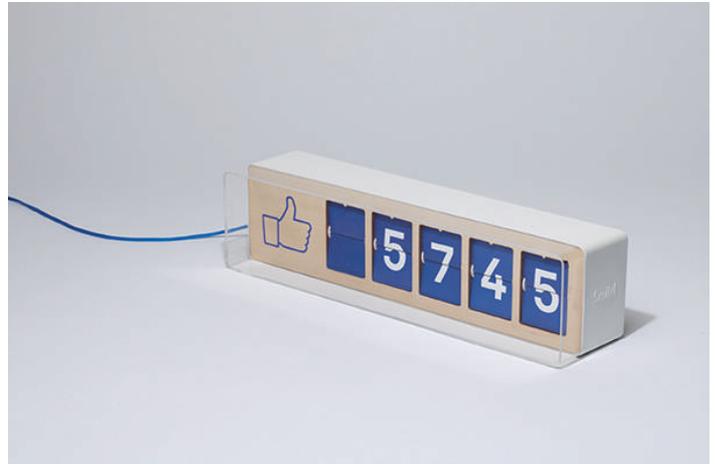
Before transferring their designs to a third party manufacturer, Hyground tested their designs with Sculpteo, This allowed the team to be absolutely positive of the design sizes and details before transferring to an injection mold. "Without your print service we would not have the product design we have today. Having the physical pieces in hand are worth their weight in gold," Reaser admits.



Sculpteo was HyGround's first and only choice when it came to prototyping their models. As you can see in the video below, the HyGround tiles have a very tight fit to allow for an interchangeable gaming board that is both solid and aesthetically pleasing. "The fit was VERY important and Sculpteo provided a 3D print that was very accurate and precise. I was also very surprised at the cost. I expected the prints to be more than they were. I've shared your site with several others who may be switching from their current 3D print provider. Shipping was amazing. Affordable and fast!" Reaser raves.

# FLIIKE BY SMIRL

**With the new Facebook Counter, you gonna love when someone likes your page. Three innovative creators designed a physical way to represent your Facebook likes. They founded Smiirl, a promising French Startup. Like all great ideas-makers, they needed a prototype before it could get started – and Sculpteo’s 3D printing service answered the call. We had the chance to meet Romain, one of the cofounders of Smiirl. Read on to discover how 3D Printing and our services played a key role in developing the first Facebook Counter.**



The idea behind this great project was simple but innovative nonetheless: create a device that fosters an online social community in the physical world. Romain explains that, “While big brands can afford huge advertising campaigns to get more likes, local businesses can’t. The Fliike instantly displays Facebook page metrics, via a flip-board type display. Therefore, it’s totally possible to create entirely new kinds of communication operations.” It thus provides a bridge between a venue’s virtual presence and its physical one.

Smiirl’s designer already had an understanding of 3D printing. He knew it was the best solution for their prototyping needs.



Romain further explains the utility of Sculpteo’s plastic, “3D printing those pieces enabled us to test them out, and refine them as best as possible. Thus, when we ordered our plastic molding, we were entirely sure about the product we’d get.”

But it’s not only Polyamide’s mechanical properties that enticed the Smiirl team: its finishes were also fine enough to make the visual prototype. In fact, any polyamide order on our website can be polished, double polished or dyed in 11 different colors. Moreover, once you get your polyamide 3D Print, anyone can apply their own finishes on it. Thanks to a serie of tutorials (available on our website), it’s easy to paint or even varnish plastic prints.

Romain continues, “Sculpteo’s services, and their quick delivery time helped us validate all the details about our product. A startup such as ours can then quickly launch their product. This way, we initiated production in record time”.

# ARTISTIC PROJECTS

3D printing offers artists and those seeking to accomplish an artistic project an entirely new means of creation. Designers and artists with an idea in the head (and moderate 3D design capabilities) can now turn that into a reality in a matter of days.

Artistic projects utilize an entirely different benefit of 3D printing - that of on demand printing. Their designs will never decay or diminish in quality, thus as soon as their object is demanded (in a store or by a gallery) they are able to print it as they wish.

Some of the most exciting projects that came through Sculpteo include the Ankou skull (which has been exhibited in multiple galleries) and Captured Dimensions (who take full-body 3D scans of individuals for unique statues).

# ANKOU

The design company Ao Gitsune recently released a new amazing creation: a levitating skull, which has been 3D Printed to better meet the project's creative needs. Of course, the printed part was made through Sculpteo's services. Perpetually floating in the air, this piece of art is a beautiful metaphor for the boundlessness of the human imagination. We got a chance to speak with Guillaume Kuntz and Arthur Clement, designers of Ankou, who told us more about their 3D Printing Success story.



Based in Paris, the brand Ao Gitsune - which means "blue fox" in Japanese - knows the 3D Printing process. Their aim is to create home furniture, such as bathroom objects, office accessories, or a range of lighting products, and almost all of their products were prototyped with a 3D printer. Additive manufacturing is the perfect solution to work out their new creations, as it is for smaller companies. The Ankou project is different more than just a means of prototyping, as 3D Printing has been used to produce the final versions of the levitating skull, thus bringing life to its designers' ideas.

Everything started from an exploration of the concept of 'modern vanity' and some experimentations on electromagnetic levitation: "Levitation is one of the first absolute laws on earth, so powerful that it affects everything. It is very similar to passing time. We decided to use gravity as a metaphor for time. Being able to break away from the attraction is a subtle yet strong metaphor to show the 'infinite' power of human imagination against the relentless force of time. The little idea made its way, step by step – a challenge as magnetic levitation won't allow design errors – gathering knowledge, skills and a lot of time" explains Guillaume Kuntz.



In order to make it possible, Ao Gitsune's designers first had to find a material light enough to meet the levitational constraints. Sculpteo's polyamide material was perfect for that. Weighing in at about 0,9 g/ cm<sup>3</sup>, it allowed them to conceive a solution which is both lightweight and visually attractive. Using an SLS printer (Sculpteo uses either OS Formiga P100, P110, P395, and P730s) Ao Gitsune could produce their objects at a high precision. Their prints had a precision of 100 µm, and it even reaches 60 µm when Batch Control is activated.

Beyond that, Sculpteo's polyamide material allowed Ao Gitsune various finishing options. When using the right finishing method, polyamide prints can attached, painted, polished, and more. Sculpteo's polyamide

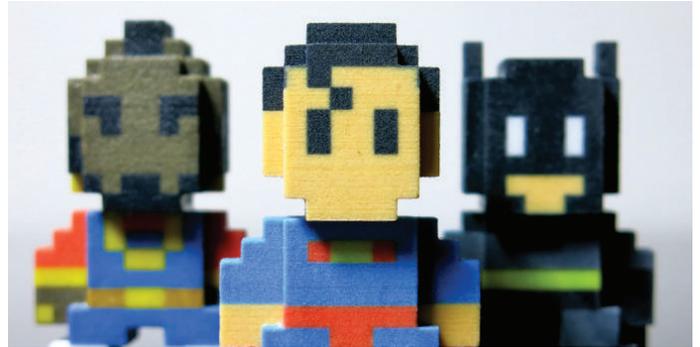
Beyond that, Sculpteo's polyamide material allowed Ao Gitsune various finishing options. When using the right finishing method, polyamide prints can be attached, painted, polished, and more. Sculpteo's polyamide material allowed them to get the high quality finishes required to produce their fine pieces of art. That's how Ao Gitsune attained such a beautifully gold gilded surface.

For now a small series has been produced, but more levitating skulls are to come, with different finishes and colors, more beautiful than the others.

As always, we're pumped to be part of the making of such an incredible piece of art.

# 8-BIT FOUNDRY

**Pixel Art is everywhere these days, flourishing in a plethora of industries. Trends in design are leaning more squarish and colorful than ever. The 8-bit graphics video games are booming, maybe even more than at the time of the 8 bit-era. Pixels' role has switched from a technical limitation to a real, long-lasting trend. There's no exception when it comes to 3D modeling: as it has in each other industry, pixel art came and invaded 3D printers. One of our pixel art designers explained us what seduced him about 3D printing.**



Designing in Pixel Art doesn't mean you're free from all the constraints of modeling. Instead, you have to conceive the shapes, and the colors of your design in an entirely different way. Pixel Art is easy to create, assuming you have enough patience to create your design square after square. Thus, most 8-bit designers prefer to use the classic Paint Software, than more elaborated Design softwares.

Jean-Rémi, designer at 8-Bit Foundry, told us his story.

"I love the minimalistic beauty of designs made from pixels: a few colors are enough to bring life to unforgettable characters and universes. I wanted to create designs aimed at those who had the 80s nostalgia, and retro gaming and Pixel Art fans. But, we can't touch pixels, get our hands on it, that's kind of frustrating.

"3D Printing liberated me from this constraint, and made my designs come to life. It's really easy and fast to go from digital model to concrete object. Above that, I just have to upload my file on my online shop, and people can order it within the second.



"Even though I've been interested in 3D modeling for a while, I had never experienced it myself before. Creating my Pixel Art characters was the perfect opportunity to get my feet wet. 3D Printing allows me to give my creativity free rein, freedom I couldn't have if I had used plastic moulding."

3D Pixel Art is becoming more common now. There's even a word for 3D pixels, called 'voxels'.

# CAPTURED DIMENSIONS

**Captured Dimensions offers 3D scans and prints at competitive prices. They use a process called photogrammetry to create 3D scans of you, your baby, or even your dog. From there the scans are processed through Sculpteo to create heirlooms to be passed on for generations.**

All 3D printing services require a 3D printable file before an object can be printed. The files can be attained through multiple websites, by creating the file yourself with a design software, through a 3D scan, or through photogrammetry.



Photogrammetry is the process of overlapping pictures to create a 3D model of an object. Sophisticated programs can then interpret the intersection of the photos to create a 3D mesh of any object that was placed in front of the cameras. These programs are available for purchase for at-home 3D modeling (ranging from free to \$25,000), but the time and quality of modeling at home can't be compared to the service provided by Captured Dimensions. They use around 80 high definition cameras that give extreme detail in a quick round of photos. From there a team of expert designers take the models and perfect the small details that may be too small to be printed.

Captured Dimensions also has high quality digital scanners, which can be used for smaller objects with similar accuracy. These are also perfected by designers then printed and shipped through Sculpteo.

A 3D printed scan offers so much more than a picture does when it comes to memories. Imagine in future years, instead of seeing an old raggedy picture on a computer screen, your great grandchildren will be able to hold a model of what you looked like, to scale, from all sides.



# OUTCAST OF JUPITER

**The comic Outcast of Jupiter combines everything that make a great project: created by three siblings, its designs look amazing, it was launched through crowdfunding and... they use 3D printing to produce their figurines. We met Shofela Coker, the artist behind the comic.**

It all started when their creators were still children, as Shof explained:



“We were inspired to create Outcasts of Jupiter by a shared love of adventure comics and television cartoons we read and saw as children.” This is how they funded the Coker CoOp:

“We are a group of three siblings, Shobo, Funlola and I, co-operating and sharing projects and artwork with the world. We tell stories through comics, possibly animation and videogames in the future. I am the artist and Shobo is the writer.

“Our first project is called Outcasts of Jupiter, a science-fiction adventure comic, Shobo and I (Shof) created. The story takes us to a futuristic world where Earth is a dump, and Jupiter became the center of the galaxy. We sought funding and exposure on Kickstarter with a successful campaign earlier in the year.”

Of course, a comic book isn't whole if it doesn't come with the tie-in products. The Coker CoOp put their minds to that as well:



“Our sister Funlola helps us expanding the universe with sculpey pins and busts, and I make 3D models. I was the one to design the Denarii mini and Denarii figures printed through Sculpteo's 3D printing service.”

Quickly, 3D printing became the best solution to create the figurines.

“ This is the first time we have used Sculpteo and we have been impressed with the results. The fast turnaround and high quality results allow us to prototype figures effectively. This fast turnaround informs the digital models created in Zbrush. For instance, the original Denarii 5 inch figure was adjusted for a dynamic pose based on observations made from the first proof. We don't have the facilities to produce PVC or resin molds, so the print on demand Sculpteo provides is key.”

# VOLKER SCHWEISFURTH

Until recently the 3D Printing industry was focused primarily on bringing digital representations of products to life. Designers and mechanical engineers were using additive manufacturing technologies to simply turn their 3D models into real objects, which populate our daily life. Volker Schweisfurth decided to take the technology a step further, as he uses 3D printing in a radically new way. He was among the first ones to imagine a way to visualize data with 3D printed sculptures. Instead of following the digital-to-reality path developed by 3D printers, he instead develop a way to give life to data through 3D printing.



Based in Germany, Volker Schweisfurth, has paved a new way for anyone willing to display data in creative way. He explains:

“Until now, online services were focused primarily on creating objects for industries that are deeply rooted in everyday life like miniatures, figurines, jewelry. But the meta-world of data was largely ignored.”

As he underlines, clients and coworkers interpret information in a multitude ways, and the key metrics of a spreadsheet during a presentation are not always perfectly relayed with a simple 2D graph. Having a physical object on the table allows the audience to hold and interpret the data in their own hands.

“Clear and concise data representation is important when it comes to all interpretation styles. A 3D representation offers the ability to really knock home a certain data set with everyone that will see it.”



This new way of representing data also allows people to see facts they might otherwise not realize at first glance.

“People probably will not go rummaging through the internet looking to find a report from the World Bank about population estimations in 2050, they may never realize that the population of China will be quickly passed by that of India!”

And he might be right. The 3D printing offers a quick and inherently interesting way to understand the information without other data convoluting the message.

Schweisfurth has been focused primarily on bringing demographical data to life. Prints that, for example, could be displayed by national or international administrations to visually represent their data.

“This makes an easy way to compare the evolution of populations over 5 a year cohort depending on the gender of individuals. This kind of data is easy to map in color on a 3D model and the precision of the print can display the differences between man and women with an accuracy of 1-2mm between heights,” states Schweisfurth.

However, in the future, 3D printed data sculptures will probably populate boards meetings, consultancy firms and redaction rooms. One of the main reasons for that is that big startups and big companies will soon start offering software to directly export data in a 3D model. This trend will be helped in its development by an accessible price for those 3D sculptures. To make those statistics real, Volker used our multicolor material.

“When I started the project I had a rough idea of the cost of such a thing, but I didn’t expected it to be that affordable. Some of the infographics I turned into 3D didn’t cost more than 30 euros and it’s possible to make almost any statistic dramatically pop for under 100 euros.”

# KENNETH BROWN

**What's really exciting about 3D Printing is that it's a great way to bring ideas to life. 3D printed prototypes are flourishing in a multitude of industries, but additive manufacturing solutions also benefit designers who are eager to launch new products. It's the easiest solution for a designer to quickly get their hands on their original designs. Kenneth Brown is one of the many designers who benefit from 3D manufacturing. We had a chance to meet up with him to hear his story.**



From an early age, Kenneth Brown has adored creation. He's spent countless hours bringing his dreams to life in a sketchbook, but his designs took an entirely new form when he started to model in 3D.

That move into 3D has undoubtedly expanded his possibilities.

"Like many artists and creators, it has always been my desire to generate a collection of intellectual property available for worldwide licensing. My inspiration came from the fascination I have for dinosaurs."

That's when he started designing his characters, that combine both humans and dinosaurs.

"I had never used 3D printing before but I started to incorporate the use of 3D printing into model making process. This allows me to create a character in a few days and have the printed piece delivered within a week. It is definitely cost effective and time efficient. The only other solutions available would have been very expensive outsourcing venture. 3D Printing is the best option to produce my creations for sure."



"The material also suits my needs really well. When I get my print, I can easily hand paint it."

The final version of his first model, called Torgantua, was an incredible success. It even has its own story on Kenneth Brown's Sculpteo store.

The designer even wants to go further: "I am working on more designs to add to my collection. Ideally, I would like to find an interested toy manufacturer to license the product to, as characters would make a great toy line with half human, half dinosaurs characters".

# JÉRÔME MORIN

**For the past 25 years Jérôme Morin has been making his grandchildren gifts for special occasions. He's devoted countless hours to scrapbooking, sculpting, modeling, and designing the perfect family gift. When he discovered 3D Printing and Sculpteo's services, he knew it would be the best choice to produce his new project. Here is his story.**

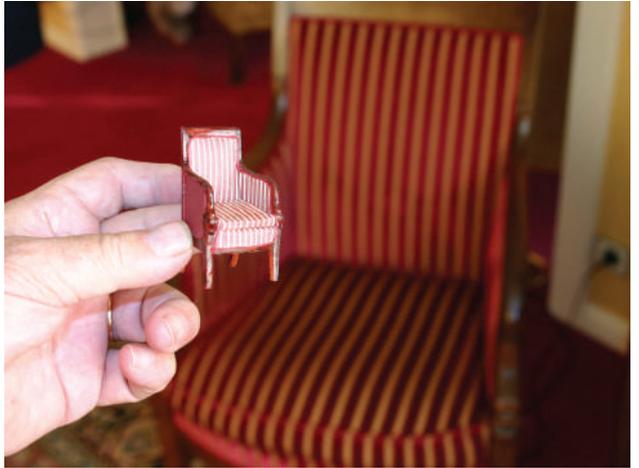
Everyday, there are new people who discover additive manufacturing as a means of production. Here at Sculpteo, we love these kinds of stories. It gives the power back to the people who want to bring their ideas to life. Jérôme Morin's story is more than just another order: its a heartwarming story about how an 80-year-old grandfather adapted to new technologies to make the best family gift possible.

This year, it was his youngest grand son's turn to have his own miniaturized present for Christmas. Jérôme Morin decided to create a replication of his living-room, at a really small scale. A true challenge when you know how many details his furnitures have.

He actually had several options for his creation.

" My main concern when I make my miniatures is about fineness and details. I had to choose between laser cutting and 3D Printing." Discovering Sculpteo's finishes helped him clear his mind and make his choice.

Using Sculpteo's plastic helped him miniaturize all the furniture he needed. "I first ordered a Louis XVI chair, in two different sizes. When I received my orders, I was really surprised with the quality of the finishes. Then I ordered more. With some modifications and fimo clay, it enabled me to make four of my armchairs, which actually look great. I plan to 3D print all of the other furnitures"



Our plastic is made from nylon powder, also called polyamid. In order to print a 3D file out of polyamid material, we use the Selective Laser Sintering process (SLS). Our 3D printers, EOS Formiga P100, P110, P395, and P730, use a highly specific laser that sinters thin layers of polyamide powder together one layer at a time. After each round of lasering, the printing bed is lowered and another layer of powder is evenly swept across the top for another round of sintering. This process is repeated at a layer height about 100  $\mu\text{m}$  until the object is completed. Printing precision even reaches 60  $\mu\text{m}$  when you activate Batch Control.

That's what allowed Jérôme Morin to create his thin and sophisticated shapes, such as for his piano stool.

Sculpteo helped him in his initiative.

"I'm not too bad at using architecture, animation or autocad softwares. But I knew I had to perfectly master 3D modelling skills to get the result I was hoping for, which would take a really long time."

We offered him to work with our professional 3D designers. Exchanging pictures and ideas, together, they managed to come out with the perfect 3D files for Jérôme Morin's project.

"Thus Sculpteo gave me the ideal solution in order to create my miniaturized furnitures."

He intends to offer his miniaturized living room for Christmas. After that, Jérôme Morin plans to create dolls with his children's and grandchildren's faces. Nothing can stop him. Here, at Sculpteo, we can't wait to discover his new ideas.



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