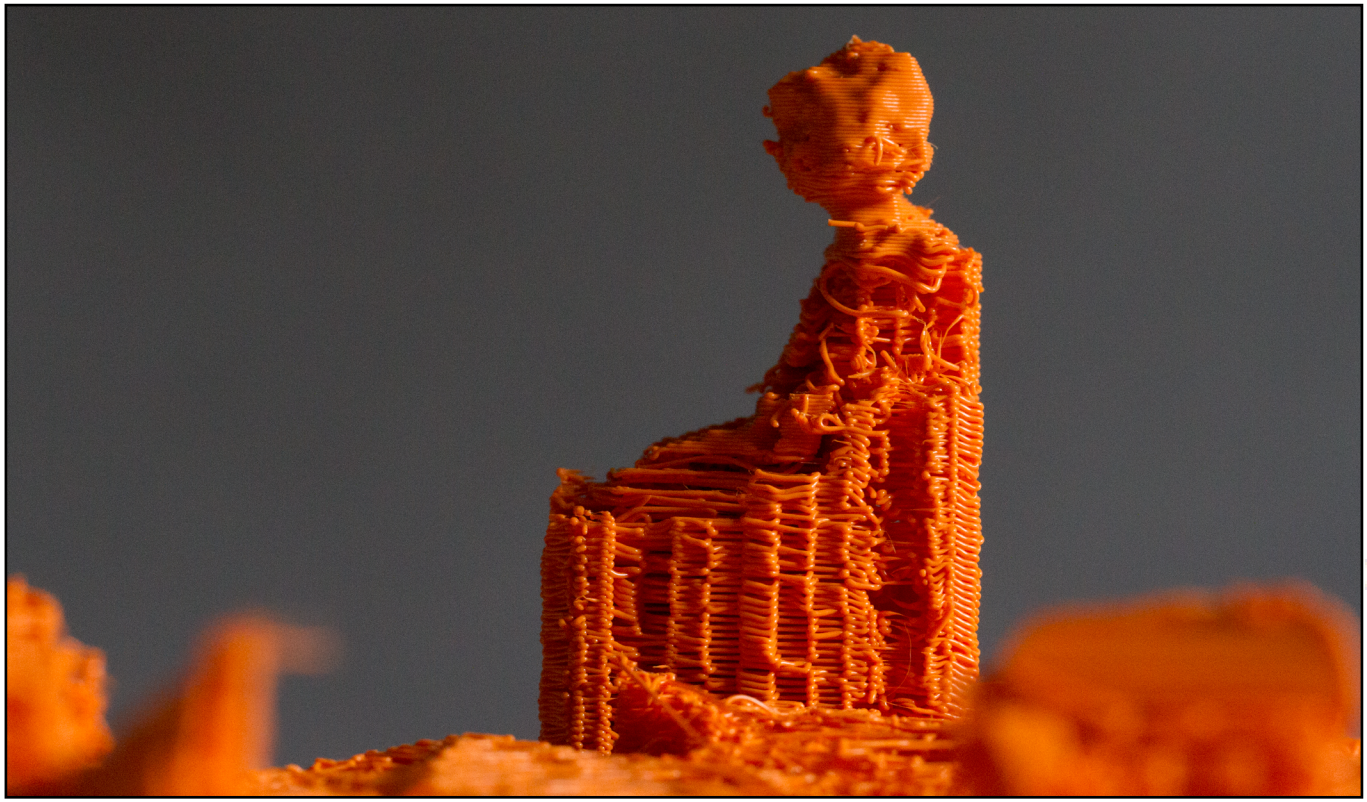

Art²Make

Objects you can print for yourself

Art²Make is an exhibition + digital catalog of artists that create sculptural objects using digital files and 3-D printing techniques. The catalog is freely distributed and links to the files for anyone to *print*.

collegeart.org/art2make

A special Thank You goes to these organizations who helped to make this project possible.

ARTspace was initiated twelve years ago by CAA's Services to Artists Committee. It has grown into one of the most vital and exciting aspects of CAA's annual meeting. A conference-within-the-conference, ARTspace presents programming designed by artists for artists and is free and open to the public.

ARTspace is made possible in part by funding from the National Endowment for the Arts.

v1b3 is an artist group that develops international curatorial projects that aim to present media artworks in various locations.

Columbia College Chicago is an international leader and recognized pioneer in arts and media education, teaching creative students to develop authentic voices and meaningful skills.

Design is the driving force behind La Salle's DArt digital arts program. The program offers students opportunities to become professional designers in print and web graphics, animation, locative media, 3-D printing, and audio/video storytelling. At the heart of the program is the belief that media artists have a special role to play in making the world a better place with their work.

50 Broadway, 21st Floor, New York, NY 10004
www.collegeart.org

Art²Make is an exhibition catalog that brings together a collection of 3-D artworks from fifteen artists and essays that help us understand the critical issues of this emerging medium. The artworks are digital files that can be printed on a MakerBot Replicator 2, a 3-D extrusion printer. Important to note is that unlike most catalogs, the pages contain a link to the digital code for each artwork that enables the viewer to print the file and thereby collect any or all of the artworks. The first edition of all the works will be exhibited at the Center for Book and Paper Gallery at Columbia College, 1104 S. Wabash Avenue, Chicago, Illinois 60605, February 10– April 15, 2014.

Art²Make is the last in a three-part series and follows the experimental concepts and format of two previous collaborative projects: **Scan²Go** and **AR²View**, which were distributed at two previous CAA Annual Conferences. All three of these publications include features designed to link additional media to each page by using the text and/or image to function as an interactive interface. The result is a catalog of artwork that can be experienced beyond the page.

My thanks and much appreciation must go to Professor Meredith Hoy for her generous commitment to this project. Artists creating 3-D printed artworks are at the edge of emerging digital media and as such rely on the articles like Meredith's to help their work be seen and understood.

The Services to Artists Committee of the College Art Association sponsored the **Art²Make** exhibition and catalog as part of ARTspace at the 2014 Annual Conference. Working together with Gail Rubini and Mat Rappaport, members of the media artist collective v1b3, CAA has created a new space and demonstrated new methods to exhibit and experience media-based visual artworks. A special thanks goes to Chris Manzione for sharing his expertise with the project.

Conrad Gleber
Professor
Director, Digital Arts & Media Design Program
La Salle University, Philadelphia

KEY WORDS
3-D PRINTING, NEW MEDIA, SCULPTURE, ARTWORKS, INTERACTIVE

v1b3 - *from place to page - evolving how we shape and consume public space*

Mat Rappaport
Associate Professor
Columbia College, Chicago

The public square and the city street are designed artifacts where individuals commune and collide in a series of actions routine and unconventional. Within this dynamic environment of static structures, the combination of large screens mounted to buildings and personal screens have changed the experience of these publicly accessible spaces. The tension between the built environment and the public that occupies and uses these spaces has been the central exploration of the creative curatorial project, v1b3.

In the mid 2000's there was a proliferation of video screens in urban spaces. v1b3 began as a response to the opportunities these new platforms provided for curatorial projects that used public screens and site specific projection. These early projects explored the ability of media to temporarily modify the environment and engage with public audiences to shape "social spaces". v1b3 defines three areas of practice: collections of video art that address themes of urban and mediated life, site-specific and responsive media-art projects, and collaborations with urban planners and architects. The resulting works have been catalogued through the v1b3 website [http://www.v1b3.com] and by distributing dvds of the video art collections.

Public screens have continued to proliferate while small screens with access to the internet have populated our pockets in the form of smart phones. Meanwhile, the architecture of artifacts dubbed digital, virtual, and social play an increasingly significant role in our experience of cultural production be it the built environment, plastic arts, or new media. As of 2013, 90.1% of Americans have internet access and 56% of American adults have a smart phone. In response to this changing context, v1b3 has employed evolving strategies for exploring our core themes. From 2012-2014 v1b3 created three curatorial projects employing the "space" of a catalog to investigate the impact of emerging media tools on artistic production while blending tangible and virtual space. The projects simultaneously seek to consider and promote the connections between artists and audience through the use of digital distribution methods.

Each catalog focuses on a different technology and method of audience interaction. The first catalog, **Scan²View**, plays with the tradition of the static artists exhibition catalog where an artist's identity, via their production, is often reduced to a single image. **Scan²View** employs QR codes to represent each artist's work in the catalog. This visual code is a link, scannable with a mobile device, that connects the viewer to a web-based artwork. Artists were asked to modify their work over the course of a year, thereby making the catalog a dynamic document.

The second catalog, **AR²View**, focuses on site specificity by using augmented reality on mobile devices to simultaneously present artists' projects within the Midtown Manhattan Hilton Hotel (the location of the College Art Association's 101st Annual Conference), the printed catalog, and the catalog's web site. v1b3 surveyed the hotel and photographically documented a selection of objects and locations, such as light fixtures, card readers, and chairs. Each

artist was assigned a photograph that they responded to by producing a companion video, image, or 3-D object. The viewer of the catalog or website would use an augmented reality browser to scan the key image thereby presenting the artwork on their mobile screen, fused to the object in the picture. Nineteen projects by twenty-four artists were presented in **AR²View.**

Art²Make, the third catalog, considers the impact of 3-D printing on artistic practices by presenting a selection of projects that utilize diverse approaches to using this technology. 3-D printing is often described as an innovative and disruptive technology both because it facilitates the rapid design and manifestation of products, but also because of the potential of 3-D printing to shift some modes of manufacturing away from international facilities to local production (perhaps even to the scale of individual homes). The output of these printers, be they plastics, ceramic, natural fibre and even some metals, is generated by a digital file. This raises interesting questions about the relationship between designer/maker and the consumer/audience. If a consumer purchases the file, they can choose the material and scale in which the object is "printed". There are also challenges in protecting copyright when files can be easily shared and models modified.

Art²Make features fifteen artists and collaboratives that utilize 3-D printing in their practices. The digitally-distributed catalog employs the traditional elements of a catalog: images of the works, projects descriptions, and essays. However, as the title implies, it also includes access to the 3-D project files, optimized for printing. The audience is encouraged to "make" their own objects, collections, and exhibitions of these works. By implementing an open distribution model, this project addresses some of the questions raised by this technology.

v1b3's recent projects and catalogs privileged access through locational intervention, ease of access, and free distribution. To date, v1b3 projects have included over one hundred artists, designers, and architects. It is the aim of v1b3 to continue to produce curatorial and site specific-works that blend the social and tangible architectures.

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Digital Materiality: Expanding Sculpture Through 3-D Printing

Meredith Hoy, PhD
Assistant Professor
University of Massachusetts, Boston

Since the inception of the Graphic User Interface, the screen has become the primary conduit through which computer users experience the output of digital computation. The computer reads and executes code, producing an array of glowing images that dance before our eyes. The digital, then, is associated with invisible processing and the screen-based interface which enables the user to view the results of that processing or activate new processes. Often, the digital image is noted for its seeming immateriality; the image on the screen flickers out of existence once computation ceases to operate, leaving no material trace or substrate, as opposed to the way that the cinematic image relies on the celluloid strip for its manifestation.

But what happens when the "object" of digital computation is eminently material, no longer an illuminated screen image but a sculptural object? Of course, we are all familiar with printed text and image, the 2-dimensional object-world built by the transmission of encoded instructions to the inkjet or laser printer. But there is another material realm instantiated by rapid prototyping, or 3-D printing, that actuates the production of digitally-generated objects that occupy the world in three dimensions. 3-D printers translate immaterial data into physical forms that can be handled, assembled, and even put to work. The functional potential for 3-D printing seems near limitless: it is possible to build working machines, such as clocks, or even the necessary parts to assemble a fully operational assault rifle. As opposed to sculptural practices that carve away material from a block of clay or marble, 3-D printing is an additive process, in which thin layers of material are layered on top of one another until the object is fully rendered. The shape of the layers is determined by individual cross-sectioned slices of the object modeled on the computer, and the material out of which the object is fashioned varies, but is most often plastic.

3-D printing has been gradually emerging in the art world. Most often, it is a technology oriented toward utility or design. How it becomes relevant to artistic discourse has yet to be resolved. The exhibition **Art^{2}Make** moves in this direction by exploring the conceptual and aesthetic territory that can be covered by projects in 3-D printing.

3-D printing can be thought as initiating a new phase in contemporary sculpture. The proliferation of media and conceptual strategies for sculptural production have expanded the field of sculpture since the 1970's. As such,

there is no unifying theory underlying contemporary sculptural practices against which 3-D printing can be measured. Nevertheless, 3-D printing intersects with algorithmic sculptural methods enacted by artists such as Sol LeWitt, whose *Incomplete Open Cubes* in the 1970's envisioned a generative strategy for building serialized models of partially constructed cubes. In 1977, Rosalind Krauss imagined LeWitt's *Cubes* in comparison to the absurdist narratives woven by Samuel Beckett. According to Krauss, for most writers considering LeWitt's *Variations*, the primary innovation of his practice consists in a demonstration of the powers of rationalism. Donald Kuspit, for example, argues that LeWitt's *Cubes* take up the Western tradition, visible from classical antiquity, through the Renaissance, and up to the present, of "the pursuit of intelligibility by mathematical means." (Kuspit 48) For Krauss, however, LeWitt's art does not merely demonstrate a rationalized form of production, but rather an absurd proliferation of, as Donald Judd would put it, "one thing after another." According to Krauss, "the babble of a LeWitt serial expansion has nothing of the economy of the mathematician's language" (Krauss 253) His *Incomplete Open Cubes* revel in the very fact of the possibility of producing multiples. LeWitt's *Cubes*, and indeed his wall drawings, create an algorithmic process for sculptural construction, a practice that can also be considered generative insofar as it cedes the control of the artist over his own practice, giving control instead to the permutational process itself.

3-D printing extends the intuitions of LeWitt into a computational context. The reproducibility of the algorithm generating each design echoes LeWitt's excercises in proliferation. But instead of the sculptural model itself revealing the algorithmic process underlying its own production, 3-D printed models conceal their algorithmic underpinnings, producing discrete objects whose origin in computational code is not necessarily highlighted. LeWitt's *Cubes* were necessarily permutational and serialized in order to convey his conceptual fascination with algorithmic processes. But 3-D printed artifacts do not necessarily operate self-reflexively, reveling instead in the power of the conjoined computer and 3-D printer to create any object imaginable to a seemingly infinite degree of detail. This possibility of creating such fineness of detail has been capitalized upon in various fields, from the production of weaponry to couture design, such as that of Daniel Widrig, whose 3-D printed designs resemble delicately ridged shells or the carapaces of insects. In inspecting these strangely organic designs, one might revel in their intricacy of detail, without becoming instinctually aware that they are generated computationally and rendered by a 3-D printer. However, in considering the ways in which 3-D printing contributes to the canon of contemporary sculptural and digital practice, the fact of the artifact's derivation from encoded computational processes cannot be forgotten, nor can the legacy of LeWitt's introduction of algorithm to sculptural production.

In **Art²Make**, artists Jonathan Anderson and Ming Tang emphasize the permutational nature of their own printed artifacts, stating that their project, which produces a series of computationally modeled "shells," "combines the notion of 'mathematic' with the notion of 'morphology.'" Likewise, Holly Holmes writes that "digital fabrication and 3-D printing extends the capability of traditional art making. It is a force multiplier combining the ability to make impossible forms variable and in series at the touch of a button." And Leo Selvaggio explains his digitally fabricated model of his face as representing "a mathematical algorithm…. However, it is also a key portion of my identity." Each of these artists seizes upon the mathematical origins of their materialized artifacts, showing the relationship between materiality and algorithm to be relevant to contemporary sculptural production. In each case, a fabricated object is one of many possible objects, both in the sense that they can be infinitely reproduced as well as infinitely subjected to mathematical permutations.

One of the inherent properties of 3-D printed objects is that, armed with the proper code, printer, and materials, anyone can reproduce that object identically. Outside of the art world, this fact became urgently apparent in 2012 when Cody Wilson began a website containing instructions for printing gun parts that, when assembled, would produce a viable, working firearm. The dangerous implications of this were immediately apparent, and the ATF quickly responded by interrogating Wilson as to the legality of his open-source 3-D printing project. Wilson was subsequently granted a federal firearms license to manufacture and deal his product, which he named *The Liberator*. Free exchange, or the rhetoric of gift-giving, was in this case turned towards the sinister, and while Wilson argued for the validity of his practice based on principles of Free Speech and the right to bear arms, it became rapidly apparent that the free circulation of information had potentially profound effects in the physical, social, and political world. No longer is information disembodied and immaterial, but attains the power to not only become embodied, but also to destroy living organic bodies. The conceptual framework underlying the objects fabricated for **Art²Make** relies on the same principle of potential reproduction and multiplicity, but instead of engaging directly with the political implications of 3-D printing, they stage artistic interventions, meditating on the nature of objecthood, of seriality, of mathematical and algorithmic variation. There is no unified aesthetic in this exhibition—each object is rendered with its own particular aesthetic sensibility. But what does unify the artifacts contained within the exhibition is their mutual fascination with the possibilities inherent in (as well as the failures of) rendering computation material.

Not only must the algorithmically generated nature of these 3-D printed artifacts be emphasized, but also it must be noted that this exhibition contains both objects and instructions for these objects to be reproduced.

As Holly Holmes claims in her artist statement, "Digital fabrication and 3-D printing extends the capability of traditional art making. It is a force multiplier combining the ability to make impossible forms variable and in series at the touch of a button. Like cells we can make one or many thousand." In this way, the exhibition participates in the tradition of relational artworks, which hinge for their conceptual and aesthetic success on the notion of gift-giving. Felix Gonzales-Torres's *Candy Spills* and Rikrit Tiravanija's *Dinners* are ready examples of this vein in contemporary art practice, in which the "form" of the artwork emerges through a material and social interaction with the components of the piece. In Gonzales-Torres's *Candy Spills*, for instance, the visitor is encouraged to take candy with them away from the gallery space, changing the shape of the work over the course of time, as well as calling forth references to the transformativity and diminution of the body over time. Nicholas Bourriaud characterizes works like this in terms of "relational aesthetics," conceived as "an art taking as its theoretical horizon the realm of human interactions and its social context, rather that the assertion of an independent and private symbolic space" (Bourriaud 14). In the case of 3-D fabrication, the objecthood of the printed designs is maintained, but the implication of making public the instructions for producing multiples of these objects throws this form of production into a social sphere which hinges on relationality and exchange. Bourriaud speaks of form as a "bonding agent" (Bourriaud 20). Form is born of a lasting encounter, whether that encounter is constituted by the meeting of paint on canvas, or zones of conviviality catalyzed by such works as Tiravanija's, in which the cooking and eating of food presents the opportunity for interactions between strangers. In the case of 3-D fabrication of multiple objects of the same design, this space of conviviality is not necessarily created. However, the culture of sharing, such as that advocated by supporters of the open source movement, is nevertheless supported by projects like these.

The notions of the "copy" versus the singularity of the "original," and the individuated agency of the artist, is brought into (literal) relief in Suk Kyoung Choi's *Les Cartes: (I make (therefore) I am*. The work consists of a useable object, namely a sleeve for business cards, that can be produced by any user. The surface of the card prints in relief an audio spectral analysis of the statements "I am" and "I make," an implicit reference to Descartes' "I think therefore I am," but updated for a new age of what Choi calls "distributed originality." The translation of the audio spectral analysis back into speech would create an echo of the voice of the speaker, and thus hearken back to some distant "original," but in the process of making and remaking the card holder that ghost of originality becomes ever more distant. The presence of the user, his or her deployment of the card holder to announce their own practices of being and making, becomes more proximate than the distant originary voice. In this way, the act of distribution, of offering up the instructions for creating the holder, is also an act of self-renunciation by the original speaker/creator/artist. Agency is given over to the new user, and the point of

origin is merely a ghostly whisper.

Another theme running through the artworks collected in **Art²Make** is the notion of failure. This exhibition does not merely present a utopian view of the capacities of digital 3-D fabrication. As Jim Jeffers states of his piece, *How to Fold a Bunny (two ways)*, "I kind of like the failures inherent in the technology." The aesthetic of his piece is one of dissolution and spillage rather than intricate and neat resolution. It brings into view the failure of the object to cohere, and calls into question whether this lack of coherence is in fact an instance of technological success (the object, in its very dissolution, is morphologically beautiful) or failure (the object, in its very dissolution, may reveal technological error). In Christian Oiticica and Nina Palomba's *PoiLomba Ticica*, a collection of 10 roughly cat-shaped toys, though the objects are notionally identical, failure is built into the production of the objects. "The files are meant to fail to some extent. When the plastic sags and warps in areas, it creates a unique aesthetic to each edition making them individual objects." This piece sets up a tension between indenticality and uniqueness, between mass reproduction and the auratic, singular object which traditionally constitutes a work of fine art. This piece intersects with the notion of the glitch, or the appearance of errors in computational processes. One would suppose that digital fabrication would produce identical objects, as there is, in theory, no degradation of the digital image in each instance of its (re)production. But materiality stubbornly clings to imperfection and uniqueness. It is precisely the failure of the process that ensures its success as an art object, if the demand for aesthetic success of an art object is idiosyncracy and individuality.

Michael Kozien's *Slow Burn: Mud Pies* engages with this very idea of the valuation of a work of art. Unlike the pieces mentioned above that build failure and glitch into the body of the work in such a way as to call into question the perfection of technology and the uniqueness of the art object, this piece builds an instance of permanent objecthood out of an ephemeral activity usually reserved for childrens' play. The making of mud pies produces a temporary object through the ludic act. Here, the energy of a childlike imagination is channeled into the production of an abstract 3-D printed sculpture. It both references its origins in play and "exceeds the transitory nature of mud," transforming an object with imaginative value (the child's game) into one with artistic value (the formation of a sculpture).

The question of value is one that pertains to all works in this exhibition. Despite the fact that the instructions for making these pieces are open source, the problem of access to the technology and the expense of that technology persists. Although the cost of 3-D printers has diminished, and individual companies such as Makerbot and RepRap have made relatively low-cost DIY 3-D printers a reality, the feasibility of creating a truly distributed network of these objects is far from guaranteed. It is, perhaps, the imaginative possibility of this

network of reproducible objects that both adds conceptual value to the works and at the same time diminishes the monetary value of each individual object.

Overall, the primary artistic contribution of the projects collected in **Art²Make** lies in their envisioning of the possibility of expanding the sculptural field by producing physical objects whose shapes are determined by computational processing. These objects are both truly digital and emphatically material, revealing the extent to which the material dimension of digitality must be considered. As Ashley Zelinskie states of her project *Reverse Abstraction—Mobius*, "humans and computers perceive the world through different languages, and what is concrete for one is abstract for the other." Nevertheless, her project, which creates Mobius-strips that contain the hexadecimal and binary codes through which they are computationally generated, attempts to resolve the gap between abstraction and materiality and to create objects that are both meaningful for human perceivers and also make reference to the language of computational processing. This work and others in the exhibition meditate on the capacity for computers to enact generative, permutational strategies in service of making material objects, thus working against the notion that digital processes are inherently disembodied and ephemeral. 3-D printing lays new ground for art practice, creating a conceptual and material territory in which digitally fabricated objects create new intersections and dialogues with traditional sculptural methods.

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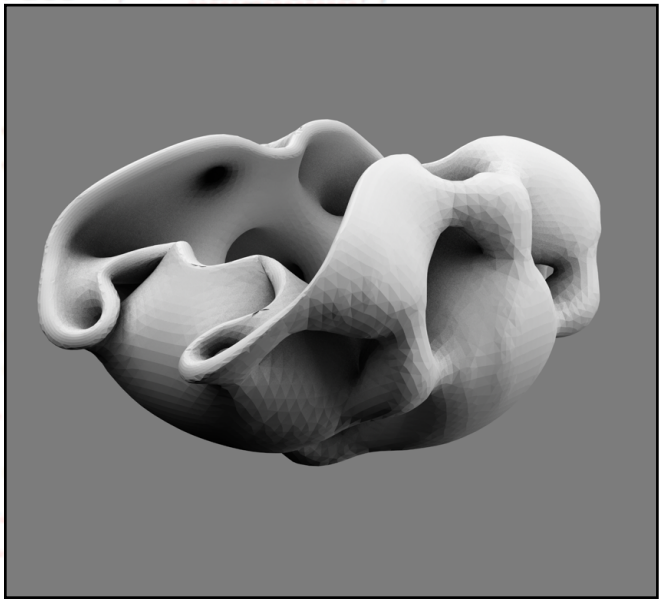


STATEMENT

The influence of digital media and information technology is increasingly evident within the creative careers. Recently, this multidisciplinary approach has reconditioned the design/making process by establishing new methods of form finding and fabrication.

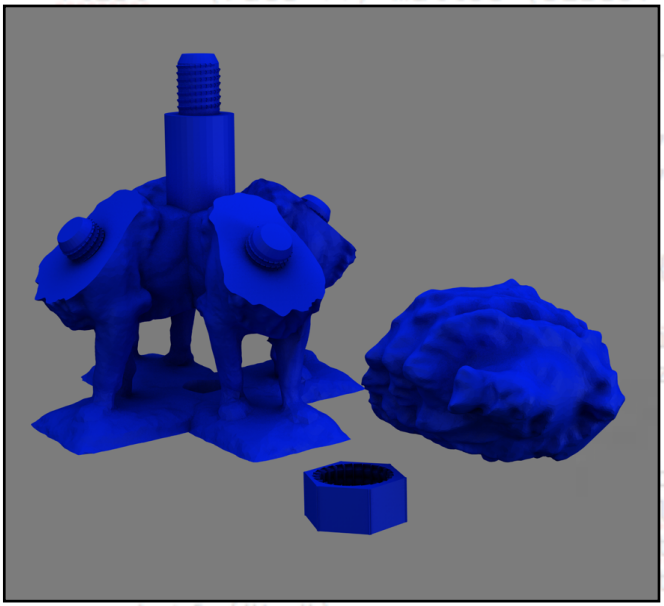
This project combines the notion of "mathematic" with the notion of "morphology". For us, *Computational Shell* represents a process that is experimental in nature and explores volumes, surfaces, and vertices that are far to complex to generate using traditional methods. In this project a series of computer models were manipulated and deformed by a series of operations and Booleans. This digital model represents the beauty in rhythm, strict proportions, movement, and repetition found in seashells.

Today, robust digital process results in novel forms that not only explore the marriage between mathematics and sculpture but also provides a platform for digital computing and physical realization.

Jonathon Anderson + Ming Tang

Computational Shell

www.jonathonanderson.com
www.ming3d.com



TOM BURTONWOOD
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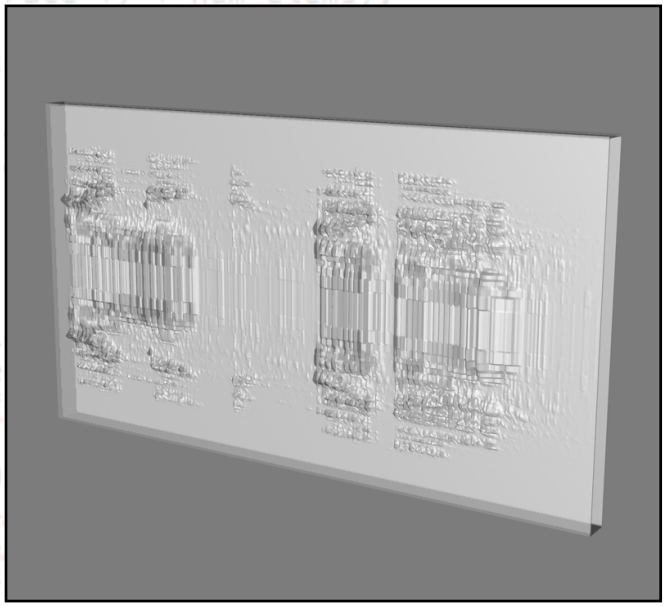
STATEMENT

3-D printing is a meme. It is the Medium and the Message. Its popularity comes at a time when other associated technologies are coming online and further disrupting established ways of working, making and representing the world around us. The rhetoric of digital fabrication is that people "can make anything." This is not true – of course. But we are getting closer to this myth, everyday. A powerful nexus point of internet driven applications, cloud computing, ubiquitous optical scanners, easy to use software and a public hungry for making things is bringing manufacturing back in a big way.

The "possibilities are (becoming) endless." We are now at a point in history where scarcity is itself – (until the resources run out) – scarce. Rare antiquities are entered into the digital universe via cheap 3-D scanning software. They are mashed up into an infinite array of permutations and re-entered into the cultural food chain. Objects are transmitted as code via the Internet around the world, even to space and back again. Once downloaded these geometries are inscribed into machine code and cut from or fused together at the push of a button. Designers have a direct connection to both their manufacturers and their end users. The feedback loop is much tighter than ever before, turtles all the way down.



STATEMENT

"Les Cartes" is a user printed sleeve for artist business cards. The surface modeling contains the data of an audio spectral analysis of the phrases "I am" and "I make". The reference of course is to Descartes' "I think therefore I am" recontextualized into the age of distributed originality. as "I am (therefore) I make."

Starting from the idea of visualizing the invisible, one may imagine also the inherent modulation of that original by its successive regeneration, a procedure whereby 'scanning' the card (holder) to extract its voice results only in distant echoes of the presence of any 'original'. Scan, convert, print, and repeat, leading to emergent forms of concrete poetry where new sounds, new objects, new meanings, arise from the reproduction of the ghost in the machine.

Suk Kyoung Choi

Les Cartes: (I make (therefore) I am), 2013

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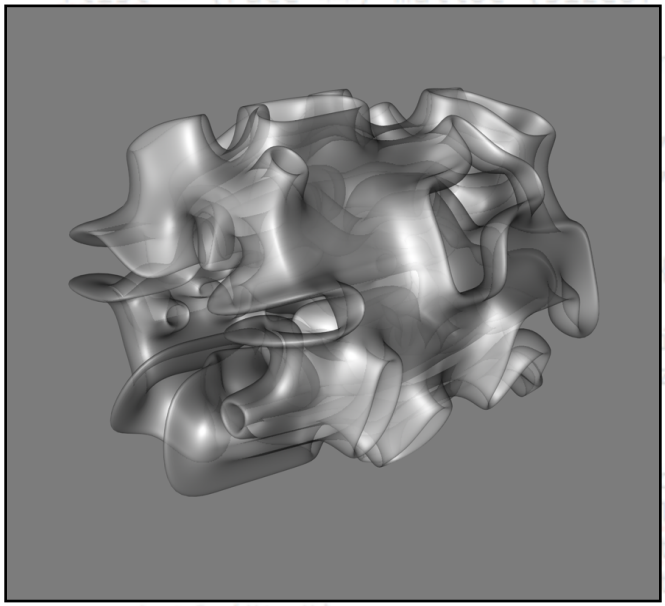
choisukc@sfu.ca



STATEMENT

These form studies embody tensions between seed geometry within a regular grid and the influence of the "natural force" of subdivision surface smoothing. In this case, random selection marks some faces of the tubular seed primitive for extrusion and invagination—a process that blows the form open and creates a double-walled vessel. Smoothing then curves and contracts the polygonal skin, drastically increasing the ratio of enclosed volume per surface area (a common adaptation of living organisms), giving the object a biomorphic appearance. And yet, the ghost of Descartes is a persistent one… despite the uncanny mesentreric folds, evidence of the grid is everywhere…

3-D printing pushes these digital forms into corporeal reality, across that other Cartesian boundary, in a process that seems hard to name: "realization," "objectification," "reification" are all freighted and creaky with other concepts. Whatever we call it, I feel what is most significant about digital fabrication technologies, particularly these early ones with their crude nature and idiosyncratic artifacts, is that they allow us to see how the digital is fundamentally different than the physical, how the model (always previously a purposeful abstraction) can swell to be richer and deeper than the thing it purports to represent—how the map can cover the territory.

CHAD EBY

Cylinder #5 from the containment studies series

chad@kth.se

STATEMENT

I wanted to focus on the relationships that come with the use of a 3-D-Printer so this was a more focused technical concept and a play on what soon may be possible through technology (the title affirming that).
I examined this linear process and mirrored it in the subject: man's death and his transition back into nature. Consciously focusing on the mass of the *.obj* files rather than the scene. I wanted to maintain a stark environment in the art; this in turn will keep focus on the physical representation.

Exploration of "content" & "finite" space realized through layers and finding one possible solution from 3-D printing.

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KRISTA HOEFLE
Kryzzik

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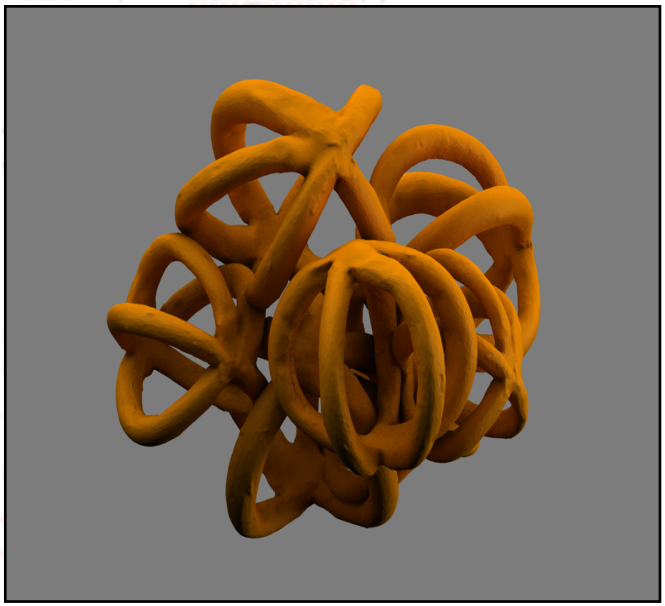
STATEMENT

I'm building or using 3-D digital models and outputting them fluidly between the two methods. Usually the origami is larger-scale, print smaller-scale. I'm working on a print of a WoW character (which is usually origami).

My recent work uses sculpture as a creative methodology in the exploration of videogame experiences. Through the reinterpretation of virtual interactions and objects into physical spaces, I'm interested in revealing underlying -or- hidden aspects of game structure that are otherwise not apparent during regular game play. Although I use a wide variety of media (digital prints, screenprints, 'zines, video), the spatial dislocation (or translation) from the virtual to the physical positions the work within the realm of sculpture. When working within a videogame itself, I'm performing or programming applications that subvert the regular rules of the game, particularly from a (cyber)feminist point of view.

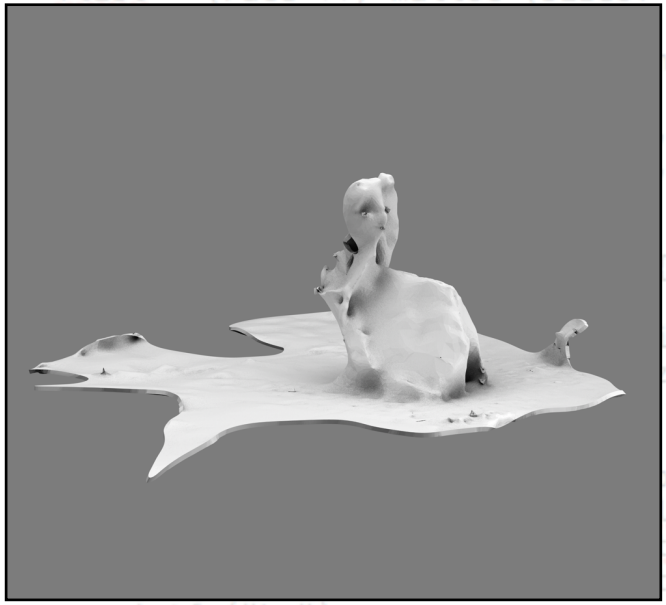


STATEMENT

Digital fabrication and 3-D printing extend the capability of traditional art-making. It is a force multiplier combining the ability to make impossible forms variable and in series at the touch of a button. Like cells we can make one or many thousand. This sculpture *Tiny Mound* is a derivative from a ceramic piece I made via hand building, and kiln fired clay. A module from the clay piece was scanned and than digitally fabricated to make the STL file. With 3-D printing I am able to extend the capability of traditional art making.

The sculpture, *Tiny Mound* refers to cell structures, nature, alchemic reactions, and fluidity of movement. The substance used to make the work changes from spools of plastic into a multi-layered artwork where the modular nature of this work is revealed. *Tiny Mound* is a stand-alone structural piece but copies of the work could be made and added to the original. Each piece carries and interprets the idea of the module or cell structure, the notion of permutation, sequencing forms, and objects from a single starting point.

Holly Holmes
Tiny Mound
hollyholmesb@gmail.com



JIM JEFFERS

How To Fold A Bunny (two ways)

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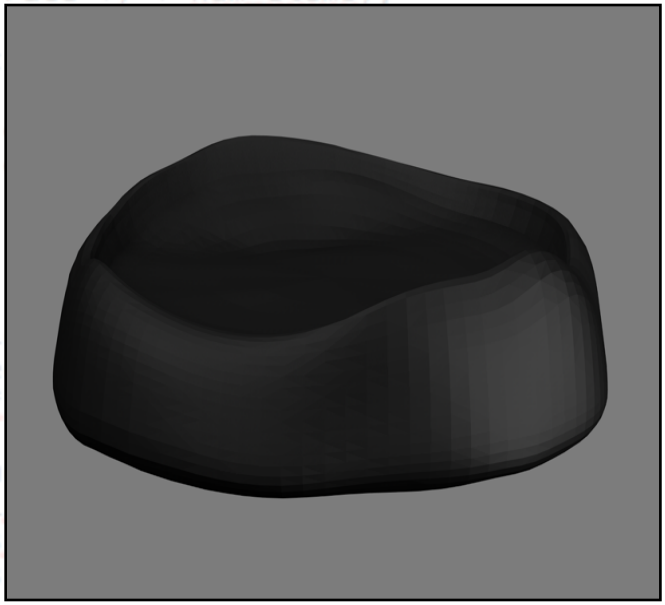
STATEMENT

How To Fold A Bunny (two ways) is an obvious nod to Ray Johnson. In this project I have included two ways to make a bunny: with paper, by hand with origami, and with a 3-D file created by scanning the origami bunny with an iPhone. I am interested in both outcomes, as tools and resources allow them to manifest as sculptural objects, flaws and all, both hand-made and machined.

I kind of like the failures inherent in the technology.



STATEMENT

Slow Burn: Mud Pies, is a bronze and iron sculpture of child-like mud pies. The *Slow Burn* series consists of cast bronze, iron, wood, plastic, and neon works engaging ideas and accounts of lifelong adult behaviors rooted from childhood development. The objects and images from *Slow Burn* reflect the nuances of behaviors, customs, processes and codes we learn at a young age and carry with use throughout our adult lives. From how we speak, move, interact, work, and play, these behaviors shape our cognitive, physical, interpersonal, and communicative landscape creating the system we use to exist in the world.

Slow Burn: Mud Pies investigates the act of play and the value/de-value of the 'made' object. As an abstract form created as an avatar from food and delight, the mud pie is dignified as an object of imagination, importance and reverence. Placed on display as a sculpture, the object exceeds the transitory nature of mud and becomes a permanent object. *Slow Burn: Mud Pies* can be displayed in a variety of sizes, numbers, arrangements, and mediums including bronze, iron, wood and plastic. 3-D printing allows the form to be easily duplicated and distributed.

Michael Kozien
Slow Burn: Mud Pies
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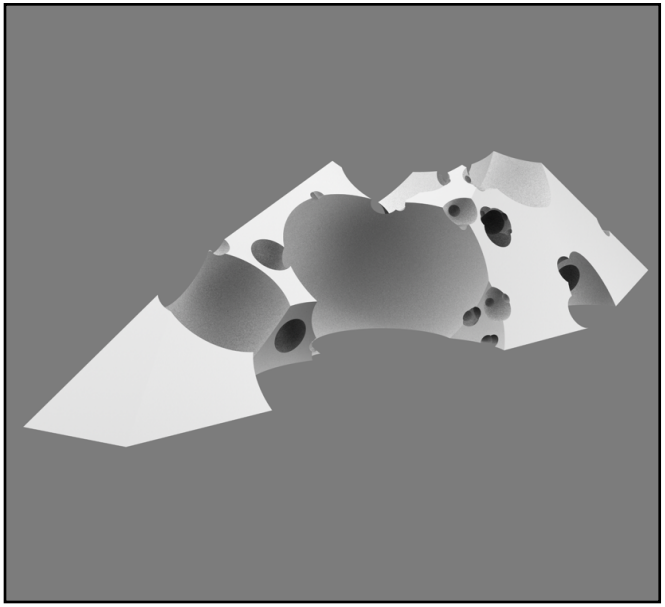

PAUL LORENZ
Information Study #8

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STATEMENT

This work is an investigation into the cartography of synthetic space. Rationally-based principles of mapping are typically applied to extant forms to produce reductive representations. Here, these same principles are used generatively to create an emergent form. This generative system imparts the work with a nebulous sense of a type of place, without representing any real place. It is this fecund vagueness that attracts me to the modeling of a simulation.

By highlighting the emptiness and the absence of inhabitation in *Information Study #8*, I attempt to qualify the limitations of abstract computer simulations. I believe that this kind of emptiness can occur whenever any type of experience is simulated through generative use of generalized algorithmic rules. This digital practice denies the complexities of real-places, instead simulating and exhibiting only those aspects of reality for which rules can be numerically deduced.

STATEMENT

Jaguar warriors were elite members of the pre-Colombian Aztec military. According to Wikipedia, Aztec beliefs suggest jaguars represented the god of the night sky. When warriors fought in their skins, they would be given strength during battle. Jaguar warriors preferred capturing enemies, believing killing to be sloppy.

This contemporary child clothed in a jaguar costume points to the transformation of the warrior mentality. Mexican criminal organizations recruit very young warriors today, promising fraternity and mystical favor, for the sake of protecting illicit narcotic markets.

Ana Marva Fernández
Az(tech)Warrior
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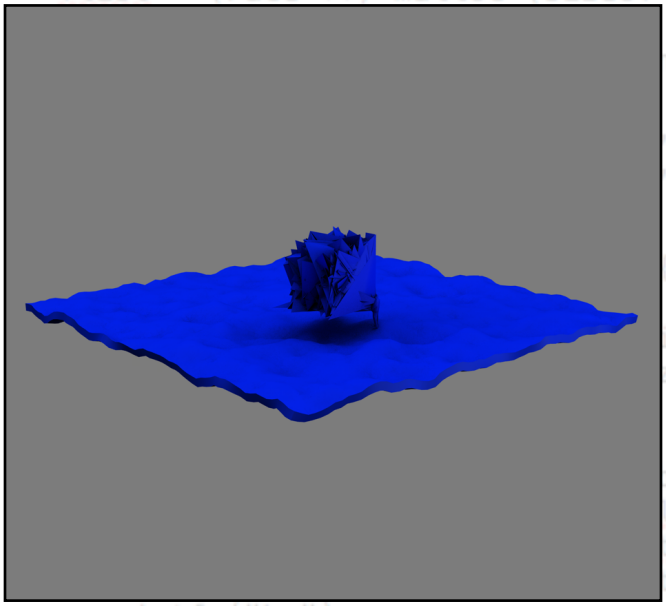


ALEX MYERS

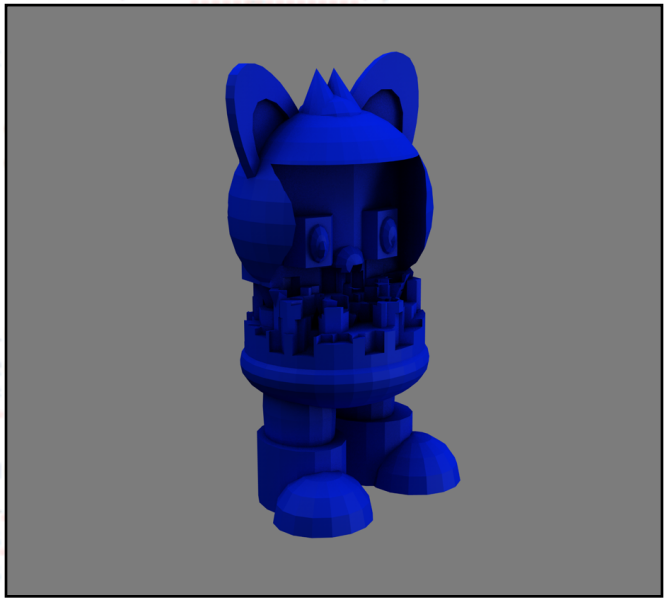
RAWERTUNES10.EXE (3DUDE REMIX)

http://alex.myers@bellevue.edu

STATEMENT

RAWerTUNES10.EXE is a noise-art album made in homage to the now late, (great?) iTunes 10 release. As iTunes 11 makes its way onto computers across the globe this album will remain as a media-archive of splendid noises transcoded from iTunes 10 executables. Exapted from the same raw code each track is now accompanied by its own 'Dude' ready to be 3-D printed, at your own expense.

made in collaboration with Daniel Rourke



STATEMENT

Our take-away exhibition will consist of an edition of 10 identical 3.5" 3-D prints. The editions are a small collaborative toy created by Christian Oiticica and Nina Palomba, inspired by the art game Exquisite Corpse. Each of us alternated taking turns to add shapes to a form in a 3-D modeling program until we created a final product, which in this case turned out to be a small cat-eared toy. The editions will be displayed lined up next to each other in a small army. The audience should be encouraged to pick up and hold the editions placed on display; after all, they are toys. The quality of each edition does not need to be exactly the same. The files are meant to fail to some extent. When the plastic sags and warps in areas, it creates an aesthetic unique to each edition, making them individual objects. Therefore, support is not needed. The required materials to make this show possible will be less than one spool of white or blue plastic.

(Can be clear if other is not available).

Christian Oiticica and Nina Palomba

PoiLomba Ticica

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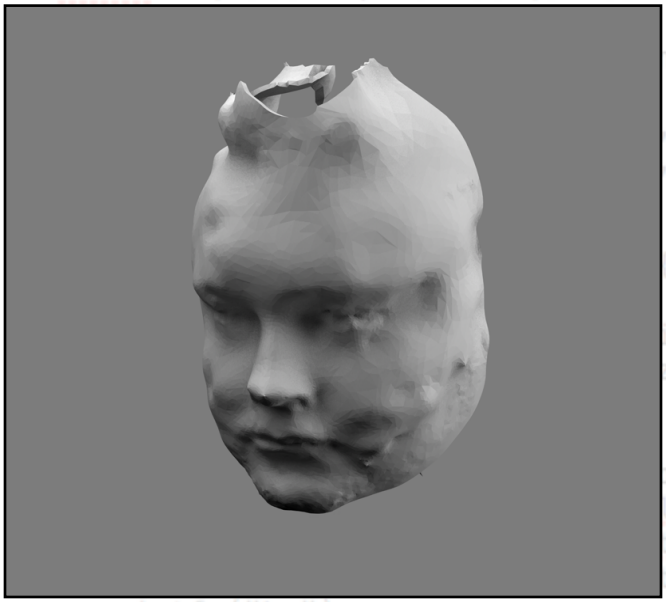

STATEMENT

URME Polygons explores my interest with identity, data, and the open source movement. As a 3-D model, my face represents a mathematical algorithm, a series of polygons arranged in a certain fashion. However it is also a key portion of my identity. In my previous work, *YouAreMe.Net*, I have supplied other portions of my identity for the public to use as material as they see fit–such as my biography, logins and passwords to social media accounts, etc.

My interests lie in experimenting with and exploring how identity is formed by asking who exactly could I be if my identity were open to public discourse? *URME Polygons* extends this dialogue by providing a new context through the proliferation of my facial identity via emerging digital technologies. My face is for you to use as you see fit. Use it in your video game designs, avatars, sculptures, or any other context you come up with.

LEO SELVAGGIO
URME Polygons

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Leo.Selvaggio@gmail.com

STATEMENT

The Reverse Abstraction series begins with a simple premise: that humans and computers perceive the world through different languages, and what is concrete for one is abstract for the other. The objects and shapes so familiar in human art can be neither perceived nor conceived by computers in their original form. Likewise, the codes that are so familiar to a computer are merely scattered symbols to human sensibility. *The Reverse Abstraction* series attempts to bridge the gap by constructing traditional objects in dual forms: as the classical object and as the hexadecimal and binary codes that represent them. Thus, abstraction becomes material, the meanings for humans and computers are united, and the duality is resolved.

Abstraction is a term used both in art and technology. Abstraction in art strays away from the recognizable whereas abstraction in computer science means the opposite for humans but the remains the same idea for computers. As something becomes more abstract in computer science it becomes more recognizable to humans and more complicated for the computer. Binary code is the furthest from abstraction a computer can be. To a computer this is recognizable, but a user interface, for example, would be considered abstract to a computer.

Ashley Zelinskie
Reverse Abstraction - Mobius

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ashley@ashleyzelinskie.com

Conrad Gleber

V1B3

Mat Rapapport

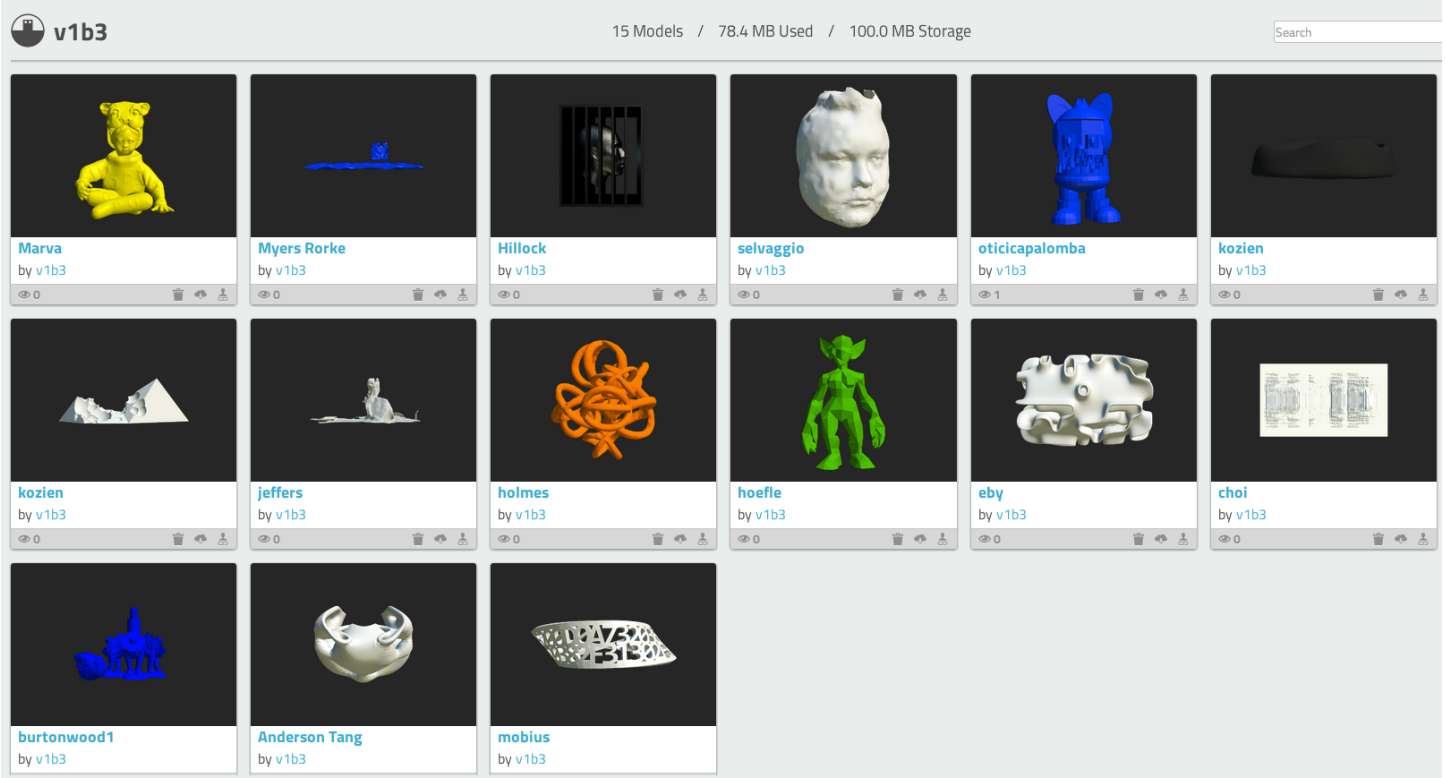
Gail Rubini

Meredith Hoy

Chris Manzione

```
/* if we're on face elements, read them in */
if (equal_strings ("face", elem_name)) {

  /* create a list to hold all the face elements */
  flist = (Face **) malloc (sizeof (Face *) * num_elems);
```




```
    printf ("property %s\n", plist[j]->name);
  }

  /* grab and print out the comments
  comments = ply_get_comments (ply,
  for (i = 0; i < num_comments; i++)
    printf ("comment = '%s'\n", comm

  /* grab and print out the object i
  obj_info = ply_get_obj_info (ply,
  for (i = 0; i < num_obj_info; i++)
    printf ("obj_info = '%s'\n", obj

  /* close the PLY file */
```

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