



Aalto University  
Media Factory

# Digital\_Fabrication\_Studio.01

## Fabbing and Fab Labs - history, concepts, fields of application

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<http://www.slideshare.net/openp2pdesign>





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# This morning:

- \* Digital Fabrication
- \* FabLabs
- \* Other spaces



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01.

# Digital Fabrication: interactions between bits and atoms

# A craft project



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“This exact material (atoms) and my perception and experience (bits)”

Source: <http://www.flickr.com/photos/kellycdb/6168020183/>  
<http://commons.wikimedia.org/wiki/Category:Wood>

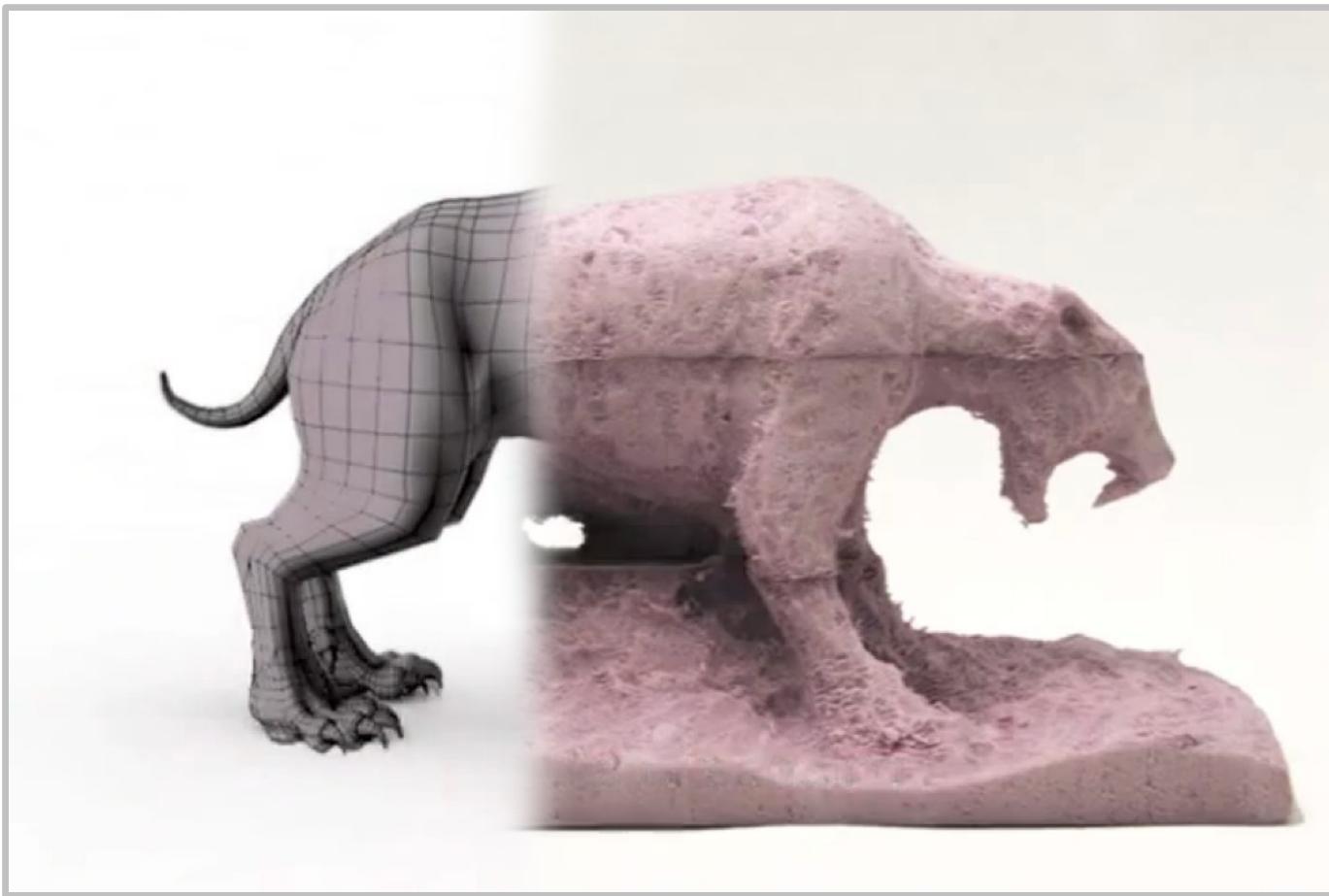
# An industrial project



“A standardized material (atoms) described only by numerical values (bits)”

Source: <http://commons.wikimedia.org/wiki/Category:KUKA>  
<http://commons.wikimedia.org/wiki/Category:Polyethylene>

# A digital fabrication (fabbing) project



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“My experience, perception and digital information (bits) shape this exact material and its values (atoms)”

Source: [http://web.media.mit.edu/~amitz/Amit\\_Zoran\\_home\\_page/the\\_freeD.html](http://web.media.mit.edu/~amitz/Amit_Zoran_home_page/the_freeD.html)

# A digital fabrication (fabbing) project



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“... and I will probably design and make my own tools” [metadesign]

Source: [http://web.media.mit.edu/~amitz/Amit\\_Zoran\\_home\\_page/the\\_freeD.html](http://web.media.mit.edu/~amitz/Amit_Zoran_home_page/the_freeD.html)

# A digital fabrication (fabbing) project



“... and I will probably design and make my own tools” [metadesign]

# Bits + atoms = information + materials



fablab  
waag society

what you can do in fablab amsterdam ▾

projects ▶

equipment ▶

## embroidered speaker tryout



### Fab Prosthetics

Abstract The major objective of prosthetics is to restore the functional capacity formerly held by a limb deficient person as closely as...



### Fab Foos

Fab Foos is a open source Table Soccer Game, featuring 2 web cams, audio response, electronic counter system and vga out. The goal was to built the...



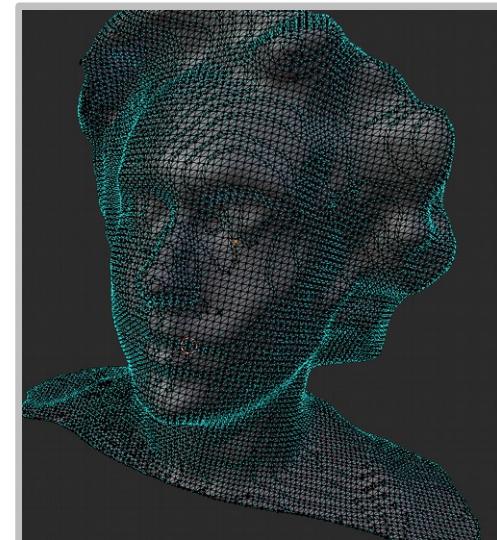
### Comm. Design

During my three months at

Developing projects at the intersections  
between bits and atoms

Source: <http://fablab.waag.org/node/3847>

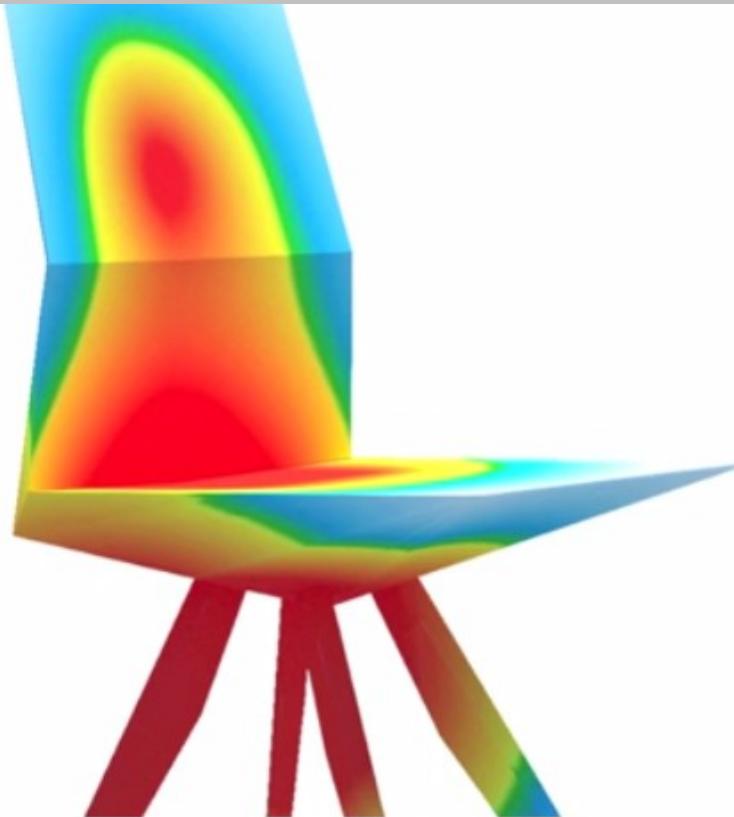
# Bits and atoms – two directions



From atoms to bits  
(getting data -  
representation)

From bits to atoms  
(build the data -  
representation)

# Bits and atoms: an application



As an individual sits in the chair, information about the flow of forces from his or her weight is depicted on visualization screens throughout the space.

Source: <http://www.designboom.com/weblog/cat/16/view/20419/audi-r18-ultra-chair.html>  
<http://vimeo.com/40877183>

# Digital Fabrication and bits+atoms: CBA @ MIT



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... not the center for rapid prototyping: “investigating the interface between computer science and physical science”

Source: <http://cba.mit.edu/>  
[http://en.wikipedia.org/wiki/Neil\\_Gershenfeld](http://en.wikipedia.org/wiki/Neil_Gershenfeld)

# Fab.01: Machines attached to a computer

**MOTOR CONTROLLED APPARATUS FOR POSITIONING MACHINE TOOL** Frank L. Stulen et al

Filed May 5, 1952  
7 Sheets-Sheet 1

Technical Drawing:

United States Patent Office

Overview Abstract Drawing Description Claims +1 -0

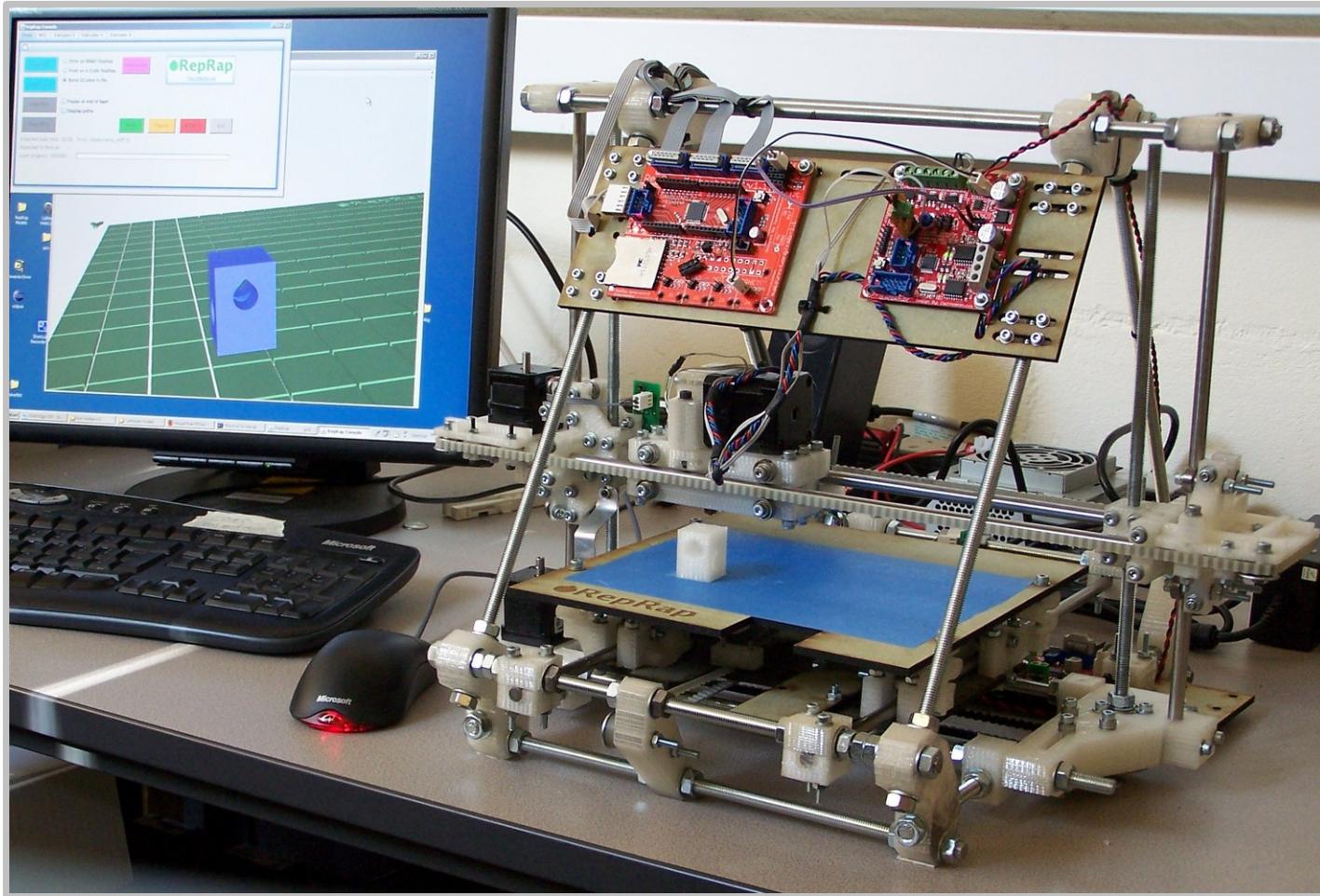
Search in this patent Go

Patent number: 2820187  
Filing date: May 5, 1952  
Issue date: Jan 14, 1958

1950s: first computer numerical control (CNC) machines, attached to computers

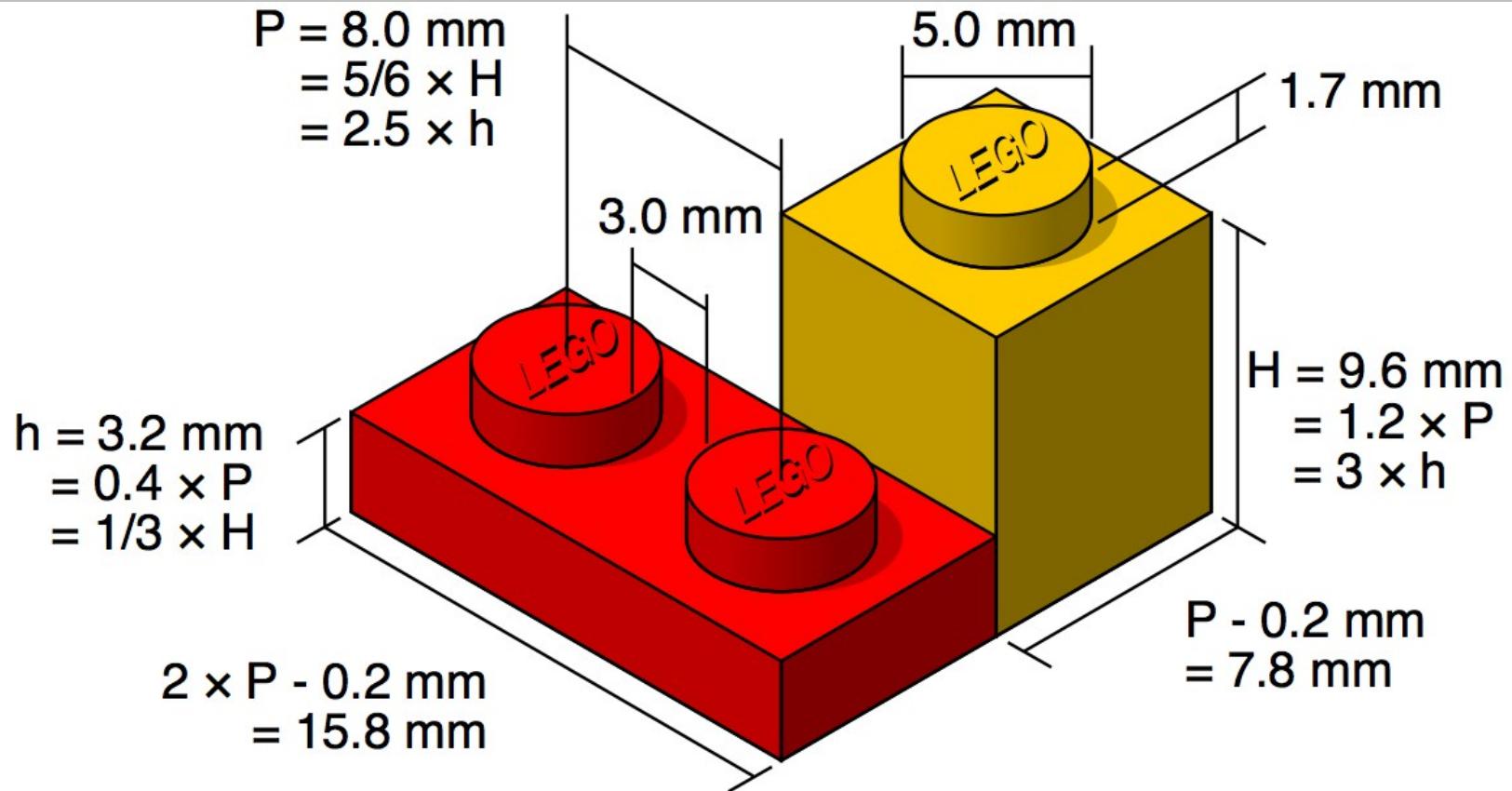
Source: <http://www.google.com/patents?id=rRpqAAAAEBAJ&printsec=drawing&zoom=4#v=onepage&q&f=false>

# Fab.02: Machines that make machines



2005: RepRapa (open source) 3D printer that replicates itself (and that generated an ecosystem of 3D printers)

# Fab.03: Materials with embedded code



Materials with an embedded code that help shaping them.

# Fab.03: Materials with embedded code

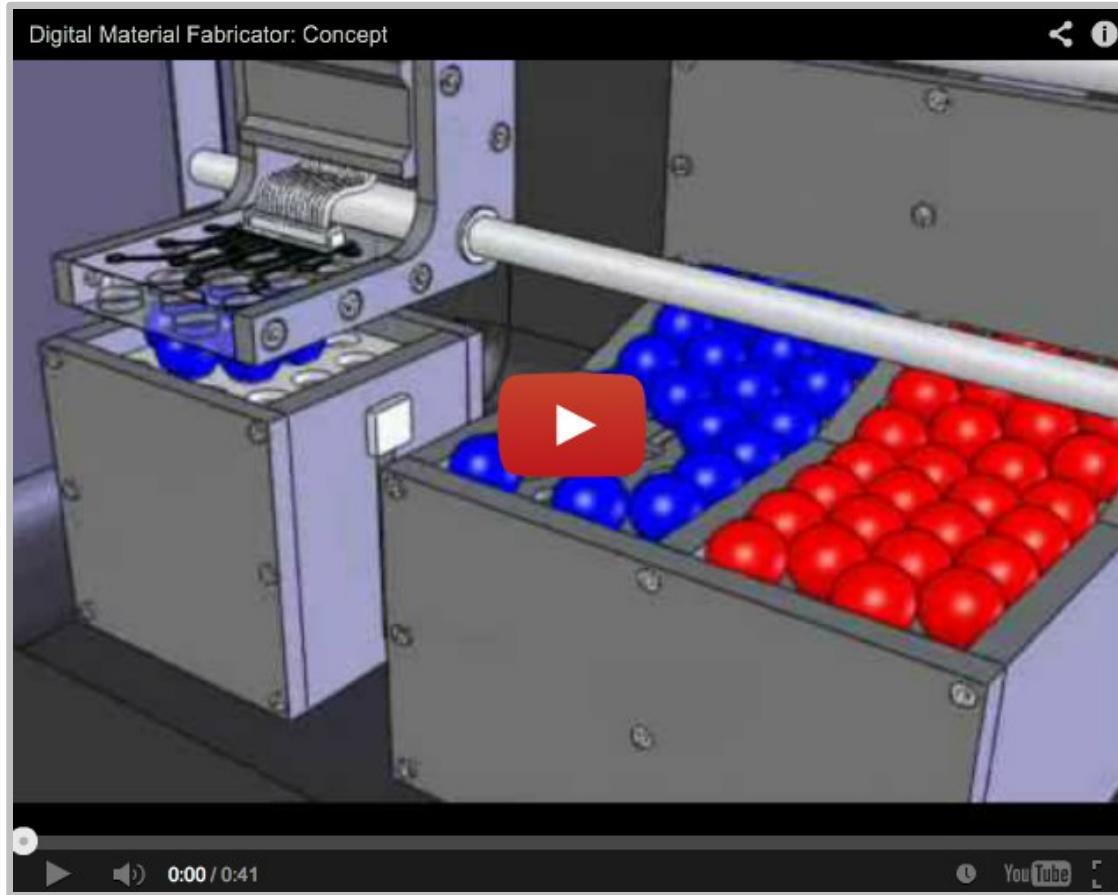


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North Carolina State University: a simple way to convert two-dimensional patterns into three-dimensional (3-D) objects using only light.

Source: <http://news.ncsu.edu/releases/wmsdickeyfolding/>  
<http://www.youtube.com/watch?v=NKRWZG67dtQ>

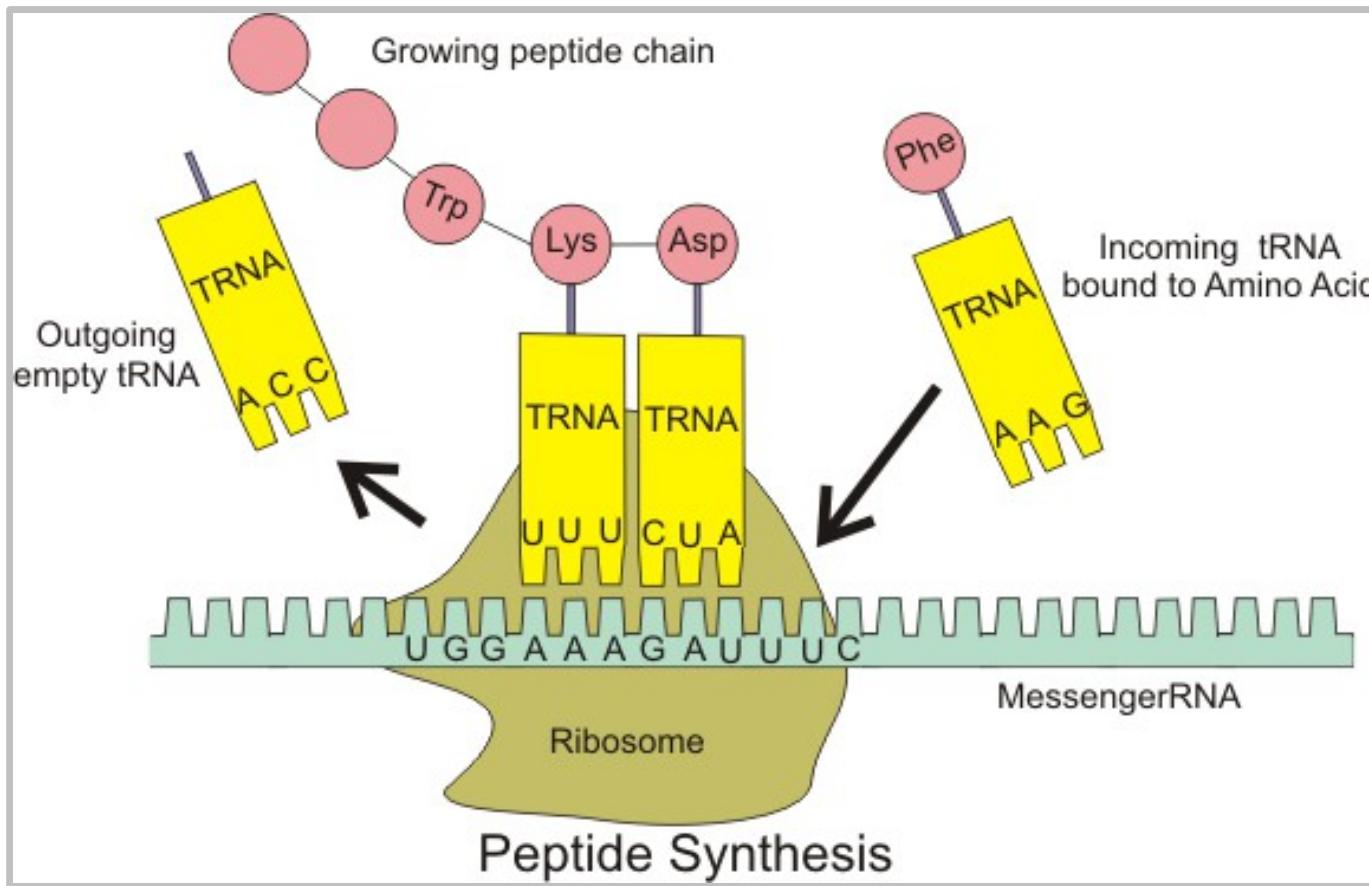
# Fab.03: Voxels + Digital Material Fabricator



In the digital domain, a 3D object is composed voxels. Each voxel location is occupied (1) or not (0), so 3D space is digital (discrete) not analog (continuous).

Source: [http://creativemachines.cornell.edu/Rapid\\_Assembler](http://creativemachines.cornell.edu/Rapid_Assembler)  
<http://youtu.be/-szjhVMGh4>

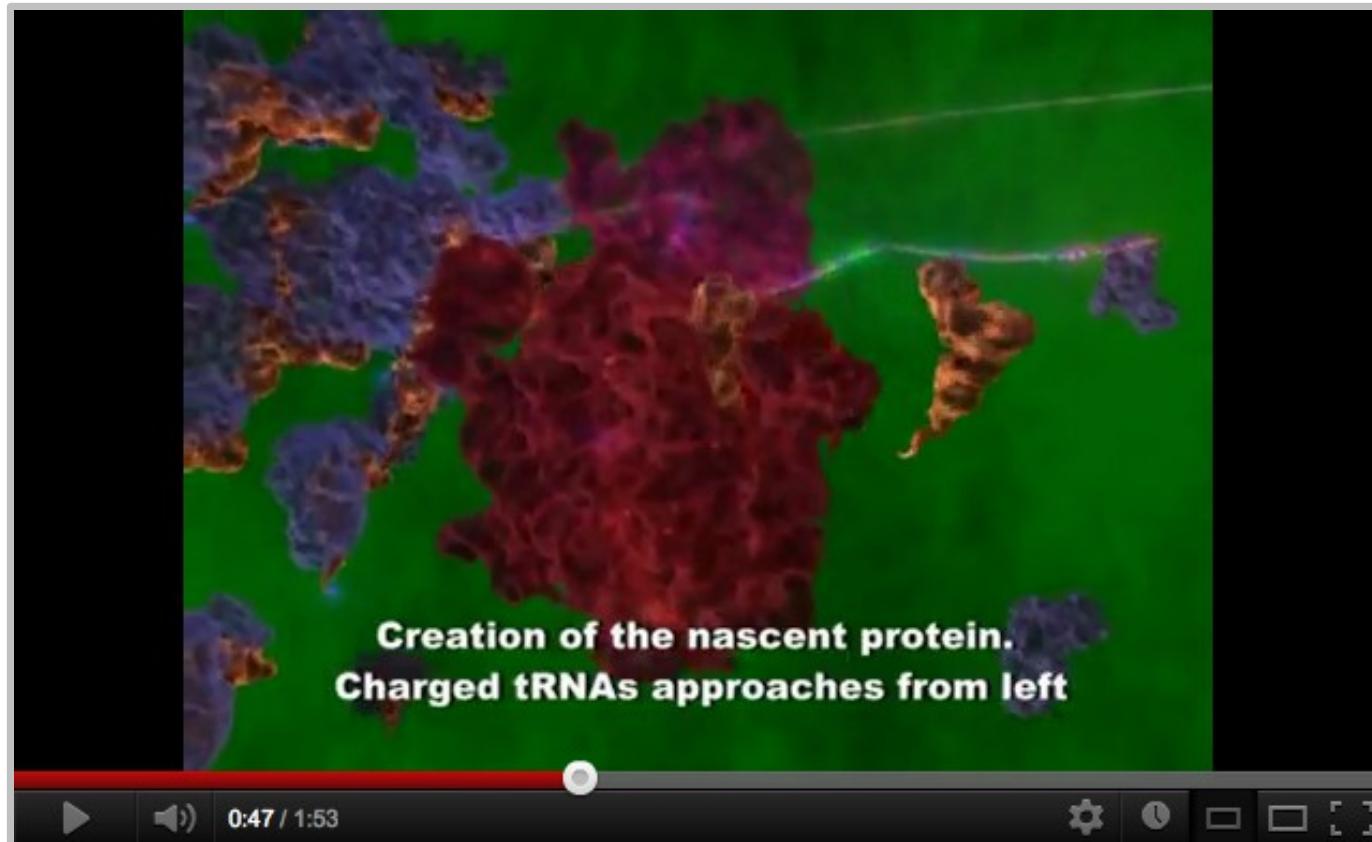
# Fab.04: Materials with embedded program



Materials that have code, data and programs  
for self-manufacturing / auto-assembly.

Source: <http://en.wikipedia.org/wiki/Ribosome>

# Fab.04: Materials with embedded program



Materials that have code, data and programs  
for self-manufacturing / auto-assembly.

Source: <http://www.youtube.com/watch?v=Jml8CFBwcds>  
<http://www.youtube.com/watch?v=1PSwhTGFmxs>

# Fab.04: Materials with embedded program



Materials that have code, data and programs  
for self-manufacturing / auto-assembly.

Source: [http://www.ted.com/talks/skylar\\_tibbits\\_can\\_we\\_make\\_things\\_that\\_make\\_themselves.html](http://www.ted.com/talks/skylar_tibbits_can_we_make_things_that_make_themselves.html)  
<http://youtu.be/emW1TQ290ec?t=2m10s> <http://www.sjet.us/SJET-MIT.html>

# Fab.04: Materials with embedded program



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Materials that have code, data and programs  
for self-manufacturing / auto-assembly.

Source: <http://www.fastcompany.com/3006145/mits-new-self-assembly-lab-building-paradigm-shift-4-d-manufacturing>

# Fab.04: coming to the Design world, soon

## Training Bacteria To Grow Consumer Goods

By Christopher Mims

Thinkers at IDEO are working with scientists to find a way to have E. coli bacteria form objects--like a coffee cup--when exposed to light. It's nature's version of 3-D printing.



Even IDEO is already researching how to manufacture products starting from bacteria that create shapes through self-organization.

Source: <http://www.fastcompany.com/biomimicry/training-bacteria-to-grow-consumer-goods>

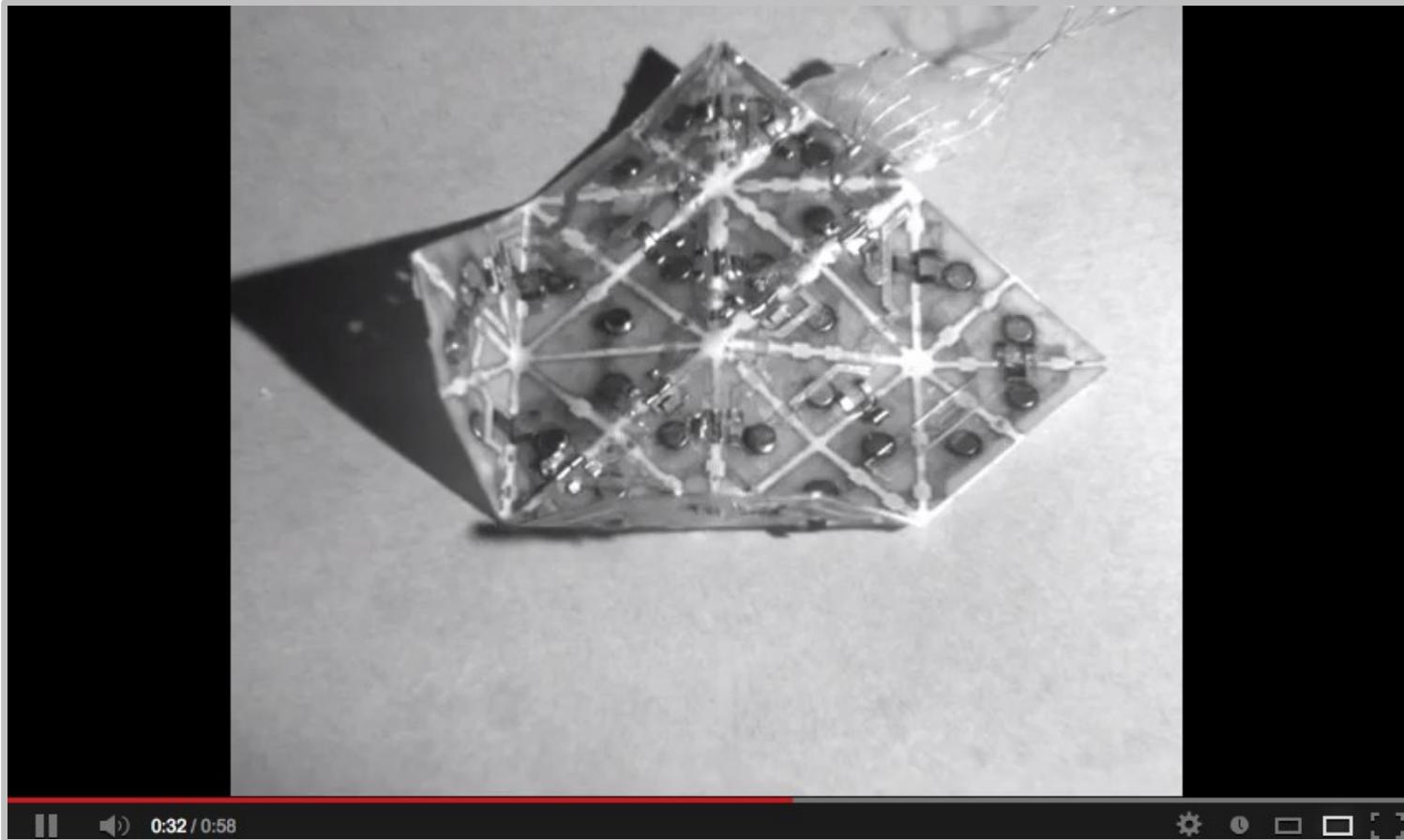
# Fab.04: coming to the Design world, soon



[...] spreading a pattern on a responsive material to control how it deforms when exposed to a stimulus [...]

Source: <http://www.newscientist.com/blogs/nstv/2012/03/plant-mimicking-gel-could-morph-into-any-3d-shape.html>  
<http://www.youtube.com/watch?v=J7MyjOTynK0>

# Fab.04: Programmable Matter



Researchers at Harvard and MIT have reshaped the landscape of programmable matter by devising self-folding sheets that rely on the ancient art of origami.

Source: <http://news.harvard.edu/gazette/story/2010/06/shape-shifting-sheets-automatically-fold-into-multiple-shapes/>  
<http://youtu.be/Pg8VAVWkz3k>

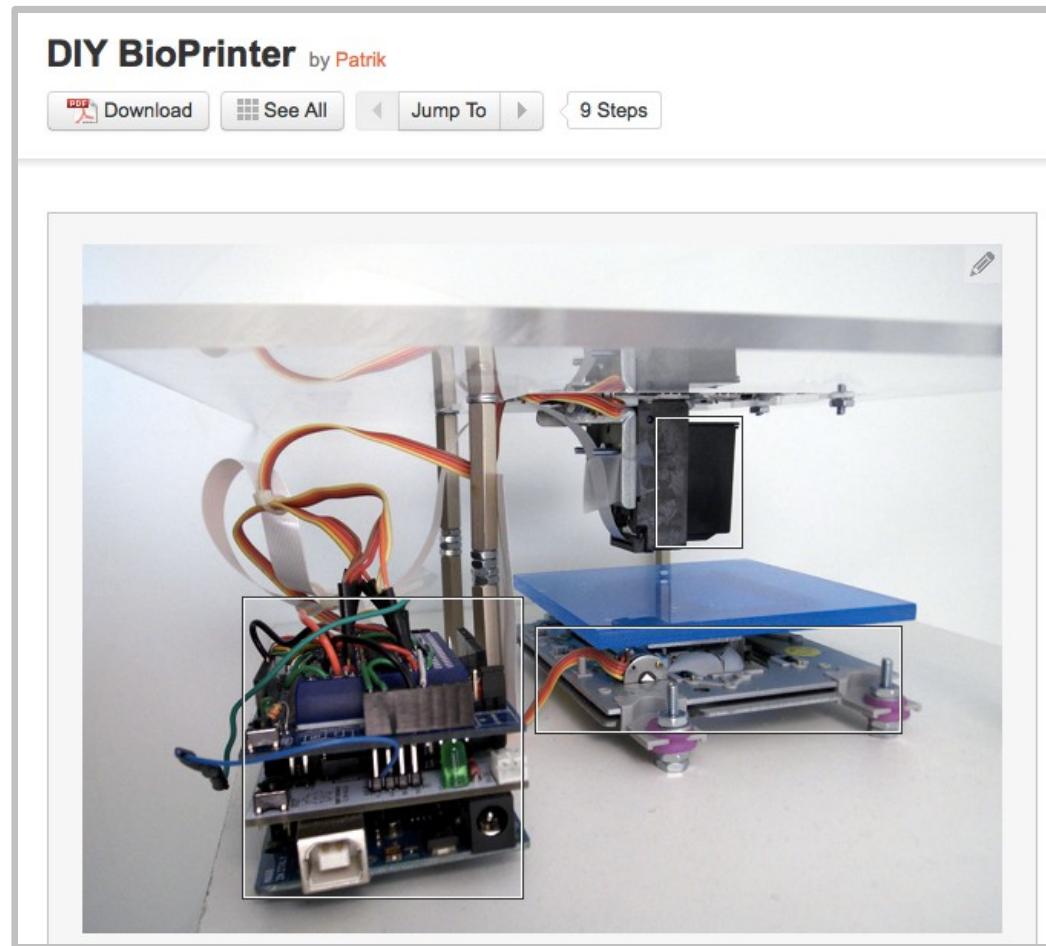
# Fab.04: DNA bricks



Complex 3D structures by using short synthetic DNA strands (“DNA bricks”). Bricks with hundreds of distinct sequences self-assemble into prescribed 3D shapes.

Source: <http://m.sciencemag.org/content/338/6111/1177.abstract>  
<http://wyss.harvard.edu/viewpressrelease/101/> <http://wyss.harvard.edu/viewpage/408/>

# Fabbing: not just learning from biology...



A new bioprinter developed at a hackerspace can print living cells for less than the cost of an iPod touch.

Source: <http://www.instructables.com/id/DIY-BioPrinter/>  
<http://www.wired.com/design/2013/01/diy-bio-printer/>

# But coming back to Fab 1.0 / 2.0 in 2012



Laser cutting



CNC milling



Vinyl cutter



3D Scanner



3D printing



Digital sewing /  
embroidery  
machine



CNC milling

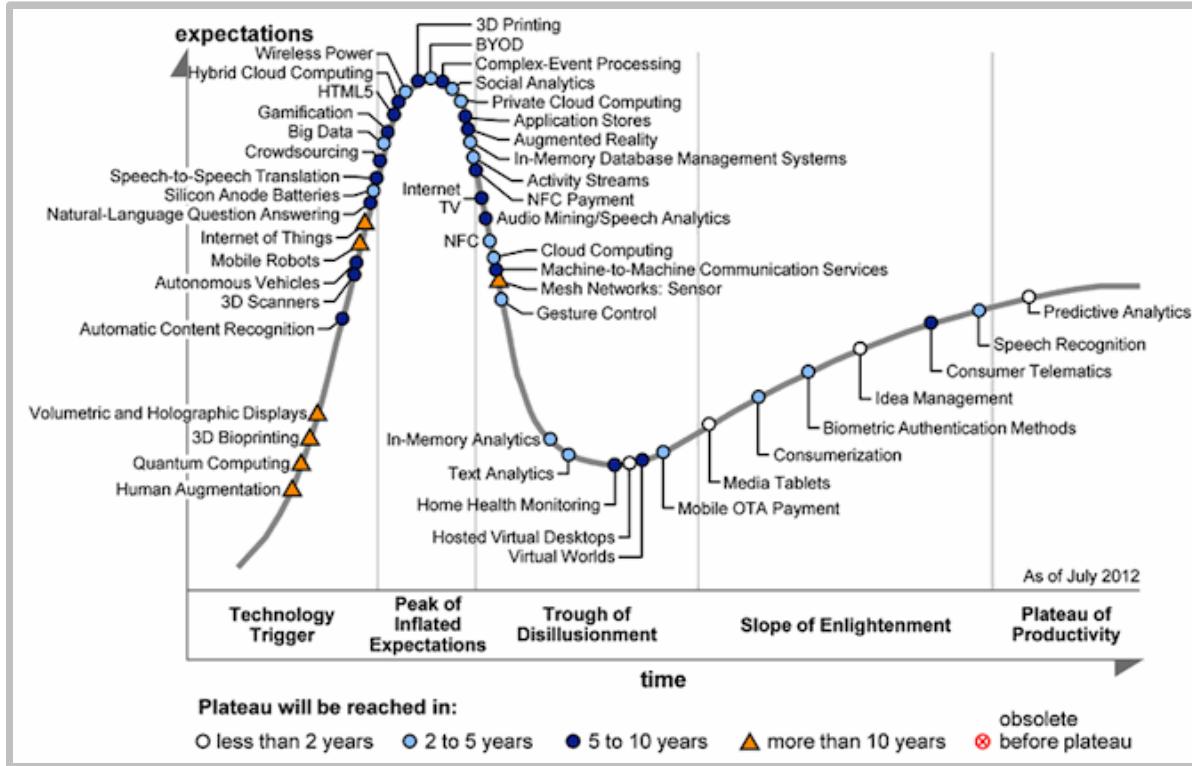


Electronics

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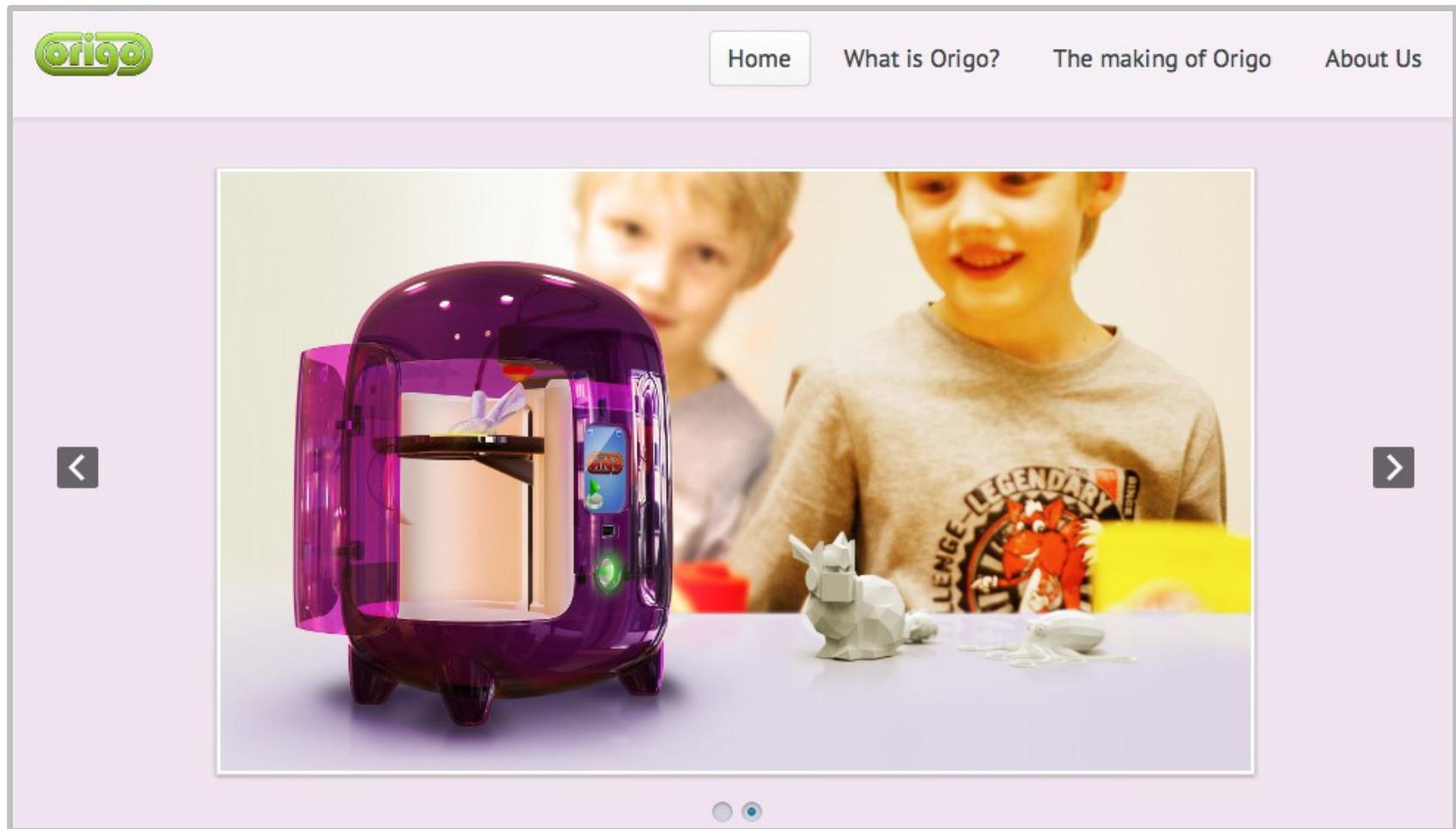
This is what you usually can find in a FabLab, at the moment.

# At the peak of enthusiasm, far from productivity



3D Printing has been steadily climbing to the peak of 'Inflated Expectations' over the past few years and now sits on top, poised for the drop.

# Democratization of Digital Fabrication

A screenshot of the Origo website. At the top left is the Origo logo. To its right are four navigation links: "Home" (which is highlighted), "What is Origo?", "The making of Origo", and "About Us". Below the navigation is a large image of a purple 3D printer standing on a table. In front of the printer is a small white 3D-printed model of a unicorn. Two young boys are visible in the background, looking at the printer. On the far left of the image is a left arrow button, and on the far right is a right arrow button. At the bottom center are two small circular navigation dots.

“Hello, I am Origo. I am a 3D printer for ten year olds.”

Source: <http://www.origo3dprinting.com/>

# ... and Digital Fabrication became famous



Digital Fabrication / distributed manufacturing as a  
viable tool / strategy for business.

Source: [http://www.wired.com/magazine/2010/01/ff\\_newrevolution/](http://www.wired.com/magazine/2010/01/ff_newrevolution/)  
<http://econ.st/tnr97E>

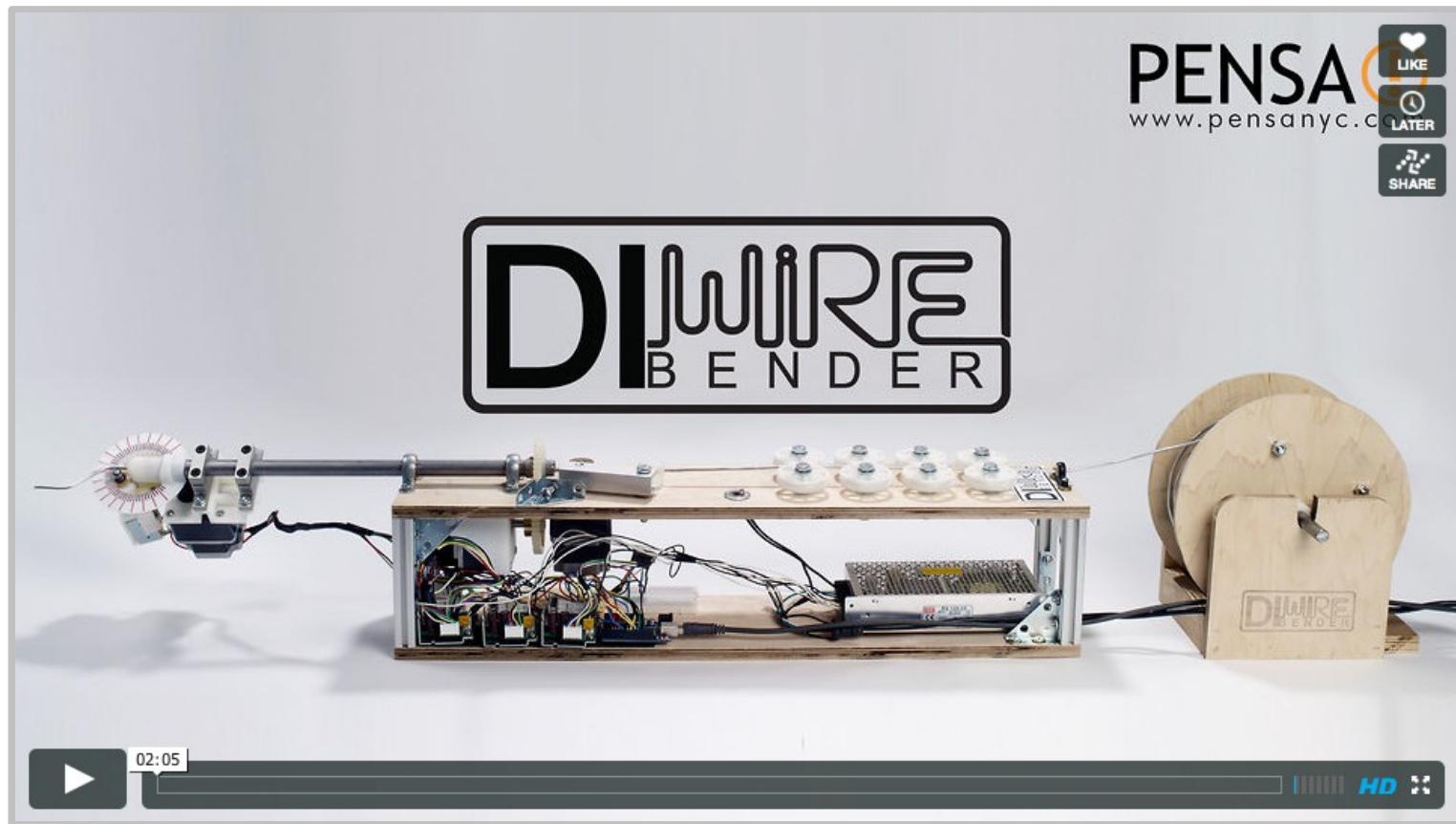
# And build your own machine...



Not only cutting and printing, also weaving...

Source: <http://www.fastcodesign.com/1669627/holy-crap-this-mit-robot-might-one-day-weave-a-building>  
<http://youtu.be/JgeFLGfvrEM>

# And build your own machine...



Not only cutting and printing, also bending...

Source: [http://www.core77.com/blog/digital\\_fabrication/add\\_pensas\\_diwire\\_bender\\_to\\_your\\_diyer\\_arsenal\\_22383.asp](http://www.core77.com/blog/digital_fabrication/add_pensas_diwire_bender_to_your_diyer_arsenal_22383.asp)  
<http://vimeo.com/41425580>

# ... between digital and hand work...

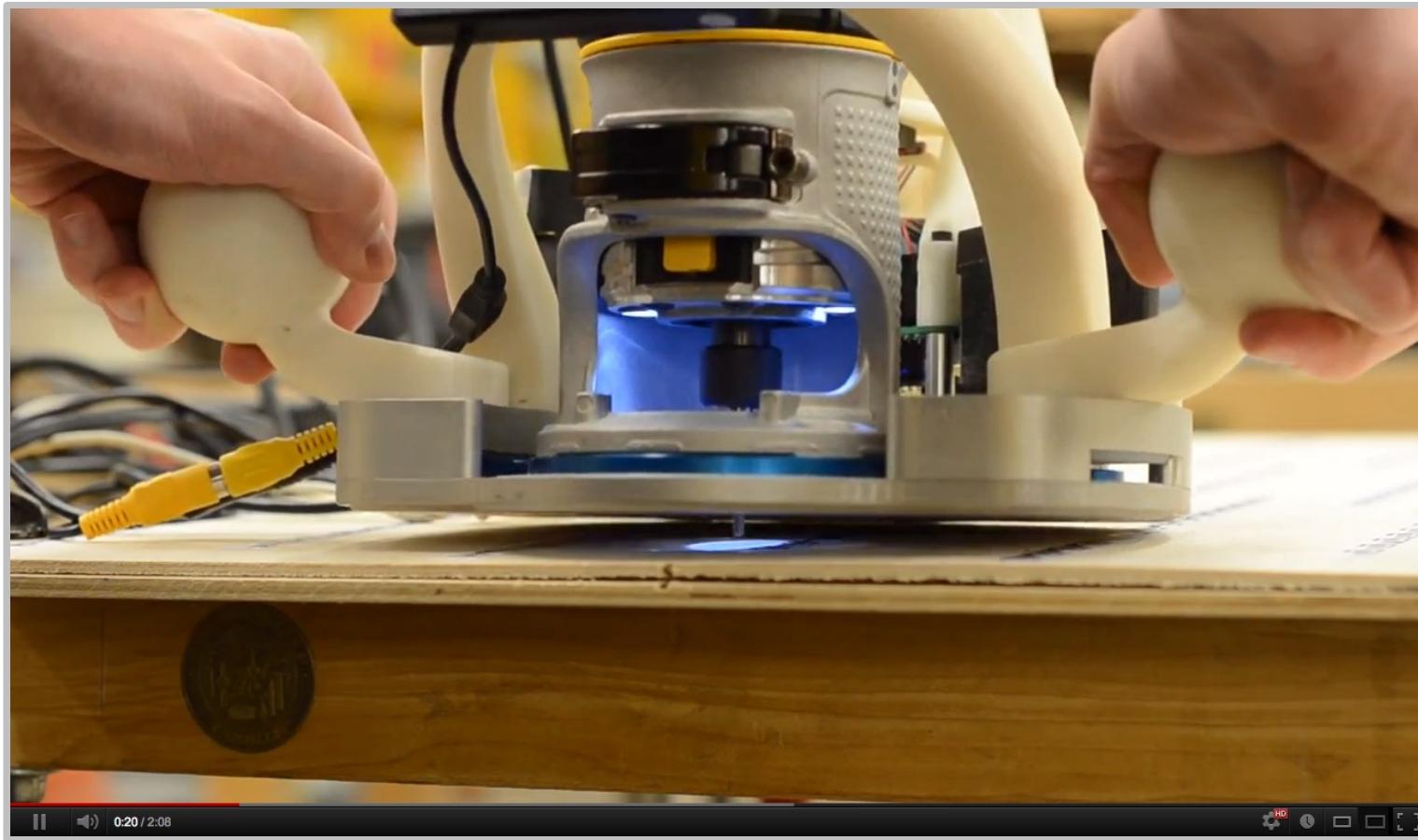


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HAPTIC INTELLIGENTSIA is a human 3D printing machine that allows the user to tactually perceive the virtual object and to directly transform it into the physical.

Source: <http://www.fastcodesign.com/1665529/a-hybrid-machine-joins-3-d-printing-and-human-handicraft-video#3>  
<http://vimeo.com/32538081>

# ... between digital and hand work...



A frame and a tool: the frame is positioned manually by the user and can adjust the position of the tool to correct for error in the user's coarse positioning.

Source: <http://www.alecrollers.com/positioncorrectingtools/>  
<http://youtu.be/-UmL7xZSUK>



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02.

# FabLabs: spaces for collaborative use of digital fabrication technologies

# A space that democratizes digital fabrication



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Exploring collaboratively the interactions between bits and atoms, rather than making (almost) anything...

Source: <http://www.flickr.com/photos/protospace/5199454304/>

# Conditions for being a FabLab

## Conditions:

- \* **public access** to the fab lab
- \* **support and subscribe** to the fab lab charter
- \* **share a common set** of tools and processes
- \* **participate** in the global fab lab network (no isolation)

The **Fab Lab conformity rating** is a code that describes how closely a lab meets the conditions for use of the Fab Lab label. It is a quick summary of the lab "now", can change over time. The conformity rating is self-assessed or community-assessed.

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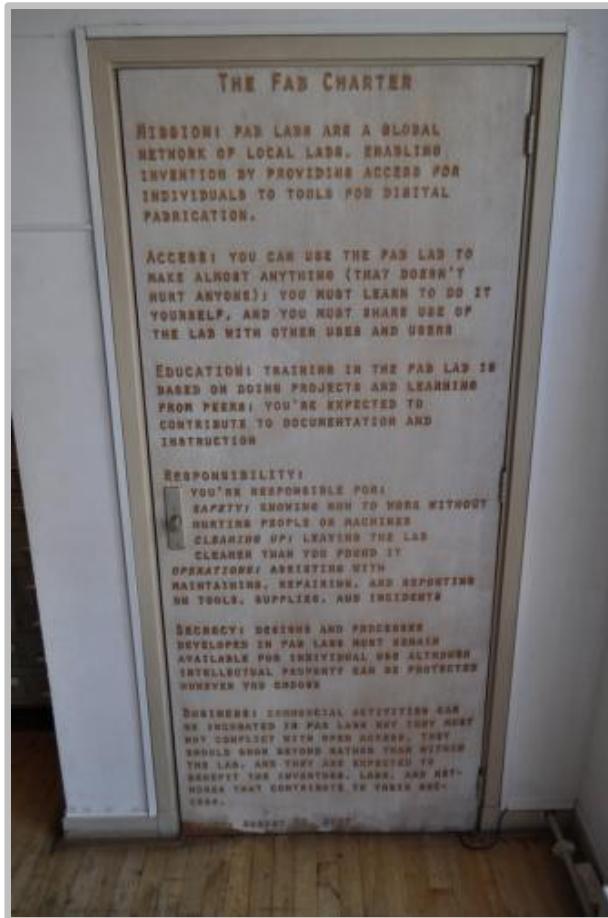
# Fab Charter

- \* **Mission:** fab labs are a global network of local labs, enabling invention by providing access for individuals to tools for digital fabrication.
- \* **Access:** you can use the fab lab to make almost anything (that doesn't hurt anyone); you must learn to do it yourself, and you must share use of the lab with other users and users
- \* **Education:** training in the fab lab is based on doing projects and learning from peers; you're expected to contribute to documentation and instruction
- \* **Responsibility:** you're responsible for:
  - \* safety: knowing how to work without hurting people or machines
  - \* cleaning up: leaving the lab cleaner than you found it
  - \* operations: assisting with maintaining, repairing, and reporting on tools, supplies, and incidents
- \* **Secrecy:** designs and processes developed in fab labs must remain available for individual use although intellectual property can be protected however you choose
- \* **Business:** commercial activities can be incubated in fab labs but they must not conflict with open access, they should grow beyond rather than within the lab, and they are expected to benefit the inventors, labs, and networks that contribute to their success.

August 30, 2007

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# Fab Charter (Amsterdam, Netherlands)



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The Fab Charter is always visible in a FabLab

# FabN : the yearly meeting



## CONFERENCE

- Profile
- Programme
- Symposium

## CONTENT

- Workshops
- Speakers
- Supporters

## INFO

- Travel
- Accommodation
- Wellington

## FAB LAB

- The Lab
- Facilities
- Access

## Profile

FAB8NZ is the 2012 incarnation of the annual international Fab Lab event which gathers field practitioners and laboratory researchers from the Fab Lab network and beyond, for a week of hands-on workshops and a one day academic symposium on the principles and applications of digital fabrication.

FAB8NZ will be hosted by The College of Creative Arts at Massey University, in conjunction with the Centre for Bits and Atoms at MIT, The Fab Lab Network and the Affect Research Centre, from 22-28 August in Wellington, New Zealand.

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Every year in August in a different country:  
this year New Zealand, next year Japan.

Source: <http://www.fab8nz.com/>

# Fab Academy

APPLICATION FORM   CONTACT   FACULTY   METHODOLOGY   SCHOLARSHIPS   VIDEOGALLERY   WHAT IT IS?  



# FABACADEMY

PRINCIPLES, APPLICATIONS AND IMPLICATIONS OF DIGITAL FABRICATION



The collage includes:  
1. A screenshot of the Fab Academy website's navigation bar.  
2. A large graphic featuring silhouettes of people against a blue background with the text "Fab Academy principles and applications of digital fabrication".  
3. A group photo of students in front of a stage.  
4. A slide from a presentation with the text "GRADUATION AT FAB CONFERENCE EVERY YEAR".  
5. A dark image of a stage or conference setting.

The Fab Academy began as an outreach project from the CBA, and has since spread to Fab Labs around the world.

Source: <http://fabacademy.org/>

# The International Fab Lab Association

The International Fab Lab Association  
*The public window to the international Fab Lab community.*



**Home**

Fab Association  
Why we are here  
Who we are  
Our board  
What we want  
How to join

**Fab Lab**

Where does it come from  
What is it in essence  
The Fab Charter  
Where are they located  
How to start one

**Fab Ecosystem**

Newsroom  
News  
Upcoming Events  
Newsletters  
Blog

**Resources**

Reading and watching  
Past events

**Members area**

**Home**



Image by Frost Gislason, 2010

**Welcome to the International Fab Lab Association**

Fab Lab International is an association of individuals interested in and/or involved in the Fab Lab community. It is a democratic organization run by its members. Their general meeting elects a board which handles the daily business.

On the 4th of July 2011, the International Fab Lab Association was established. It is an association with members, a Board and an Academic Council, etc.

Source: <http://fablabinternational.org/>  
<http://fablabinternational.blogspot.com/>

# Fab Lab Amsterdam (Netherlands)



Fablab Amsterdam is hosted by Waag Society, a non profit organisation active in the field of social innovation through creative technology.

Source: <http://fablab.waag.org/>  
<http://www.flickr.com/photos/37873897@N06/4973326149/>

# Mini Fab Lab (Utrecht, Netherlands)



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A FabLab in your room for 3500 €.

Source: <http://www.minifablab.nl/>

# Mobile Fab Lab



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In USA, Europe, South Africa...

Source: [http://en.wikipedia.org/wiki/Mobile\\_fab\\_lab](http://en.wikipedia.org/wiki/Mobile_fab_lab)

# Fab Lab Afghanistan (Jalalabad, Afghanistan)



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Not only in USA or Europe ...

Source: <http://www.fablab.af/>

# Fab Lab Afghanistan: FabFi, a project



An open-source, FabLab-grown system using common building materials and off-the-shelf electronics to transmit wireless ethernet signals.

Source: <http://fabfi.fabfolk.com/>

# FabLab Barcelona (Spain)



The screenshot shows the homepage of the Fab Lab Barcelona website. At the top left is the logo, which consists of three stylized human figures in red, green, and blue forming a circle. To the right of the logo is the text "FAB LAB BARCELONA" in large, bold, sans-serif letters. On the far right is the IAAC logo, featuring the letters "Iaac" in a large, bold, black font, with "Institute for advanced architecture of Catalonia" in smaller text below it. Below the main title is a navigation bar with links: HOME (highlighted in grey), EL FAB LAB, EQUIPAMIENTO, SERVICIOS, VIDEOS, GALERIA, CONTACTO, MACHINE RESERVATION, and WIKI. A date banner at the top says "THURSDAY SEPTEMBER 22ND 2011". To the right of the banner is a search bar with a magnifying glass icon. The main content area features a large image of a exhibition booth with various displays and people looking at them. A caption below the image reads "Thursday, August 25, 2011" and "Muestra Fab Products en el Fab7 > Concurso de innovacion en el Fab Lab Bcn". To the right of the main content are three "Featured" news items with thumbnail images and descriptions:

- Fab 7 – Lima (Peru). Séptima conferencia mundial de Fab Labs.**  
Cada verano, la red mundial de Fab Labs se reúne de manera "física" en un lugar del mundo para discutir [Read More]
- UNIBE workshop > Fabricacion Digital en el Caribe**  
El taller UNIBE workshop tuvo lugar en el Fab Lab Barcelona del 26 al 30 de Abril. 14 estudiantes de primer año de [Read More]
- GREEN FAB LAB Project presentation at Valldaura**  
Last Friday the IAAC community launched the new project for the upcoming years. The GREEN FAB LAB will be a research, [Read More]

From the Institute for Advanced Architecture  
of Catalonia (IAAC).

Source: <http://fablabbcn.org/>

# FabLab Barcelona: FabLab House, a project



**FabLab  
House**

info@fablabhouse.com

IAAC | MIT's CBA | Fab Lab



"Una casa solar debe fabricarse con un material solar, como la madera."

Salvador Rueda, ecólogo Director de

The Fab Lab House is a self-sufficient dwelling produced to take part in the Solar Decathlon Europe 2010.

Source: <http://www.fablabhouse.com/>

# A FabLab and its local context



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A city with a long tradition of organic / generative architecture and experimental building technologies.

Source: [http://en.wikipedia.org/wiki/Casa\\_Batllo](http://en.wikipedia.org/wiki/Casa_Batllo)

# Green FabLab Barcelona

The screenshot shows the homepage of the Green FabLab website. At the top is the logo "GREENFABL" with a stylized globe icon. Below it is a banner with the text "Naturaleza, Tecnología y Energía." and "Parc de Collserola, Barcelona". To the right is a date "March 24, 2010". A large landscape photograph of a mountainous area with a building in the foreground is displayed. Below the banner is a map showing a network of roads and paths. On the right side of the page are several logos: "GOBIERNO DE ESPAÑA", "MINISTERIO DE INDUSTRIA, TURISMO Y COMERCIO", "plan avanza...", "Un proyecto de Iaac Instituto de arquitectura avanzada de Cataluña", "Con el apoyo de THE CENTER FOR BITS AND ATOMS Massachusetts Institute of Technology", and "B ECOLOGIA N".

A fablab that researches sustainable technologies with and for digital fabrication.

Source: <http://greenfablab.org/>

# The future: Barcelona FabCity



*“Toni Vives [...], Head of the Department the Urban Habitat in the Office of the Mayor of Barcelona and member of the IAAC Board of Directors, presented the city’s plan to become a “Fab City” with multiple Fab Labs in neighborhoods around Barcelona.”*

Source: <http://www.iaacblog.com/blog/2011/iaac-at-fab-7-in-lima-peru/>

# Fab Lab Brand: no trademark



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So far, and except some countries (Netherlands) where  
is managed by the local association.

Source: <http://fab.cba.mit.edu/about/logos/index.html>

# Fab Lab and Brand: a possible strategy?



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Do you recognize this brand? It tried to open a FabLab in Madrid to show how it cares about creativity.

Source: <http://www.flickr.com/photos/journal-du-design/3895643669/>

# Absolut Lab (Madrid, Spain)



A huge FabLab sponsored by Absolut Vodka, that was closed few months after its opening...

Source:<http://www.franciscosegarra.com/absolut-lab-proyecto-interiorismo/>



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03.

# FabLabs and Fabbing: applications and examples

# A space for DIY projects



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The first value offer is a space for people to develop (and learn) their own projects.

Source: Scott Beale / Laughing Squid <http://laughingsquid.com>  
<http://www.flickr.com/photos/laughingsquid/133324021/>

# No idea for a project? Hack one!



The screenshot shows the homepage of the IKEA Hackers website. At the top left is the logo "IKEA HACKERS" in yellow and blue. To the right of the logo is a cartoon illustration of a person holding a wrench, looking up at a glowing lightbulb. Below the logo is a navigation bar with four items: "Home", "About", "Start here", and "Post a hack".

Three projects are featured below the navigation bar:

- Mirrored luxe**: A mirrored cabinet with a silver frame and legs.
- Extendable bedside lamp**: A lamp with a single bulb mounted on a flexible metal arm, positioned next to a white sofa.
- Aneboda chest makeover**: Two images showing a wooden storage unit being transformed; the left image shows it with its original finish, and the right image shows it with a new, light-colored paint job.

IKEA products are cheap enough, there are many options and components that can be reused.

Source: <http://www.ikeahackers.net/>

# Generative Design

**neuroous system** [SHOP](#) [BLOG](#) [ABOUT US](#) [TOOLS](#) [STOCKISTS](#) [JOBS](#) [CONTACT](#) [login](#) [cart: 0 items](#)

[JEWELRY](#) [HOUSEWARES](#) [CONCEPTS](#)

vessel pendant and spiral bracelet model photography by Natalia Borecka

**featured products**

SILVER VESSEL PENDANT \$275.00

HIVE TRIVET \$12.00

Generative Design projects need digital fabrication technologies for being manufactured.

Source: <http://www.n-e-r-v-o-u-s.com/>

# Physical Data Visualization

## // MICROSONIC LANDSCAPES

An algorithmic exploration of the music we love. Each album's soundwave proposes a new spatial and unique journey by transforming sound into matter/space: the hidden into something visible.



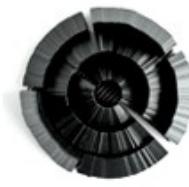
// ARVO PÄRT  
Für Alina



// THIRD  
PortisHead



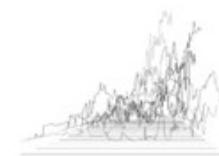
// ANOTHER WORLD  
Antony & the Johnsons



// PINK MOON  
Nick Drake



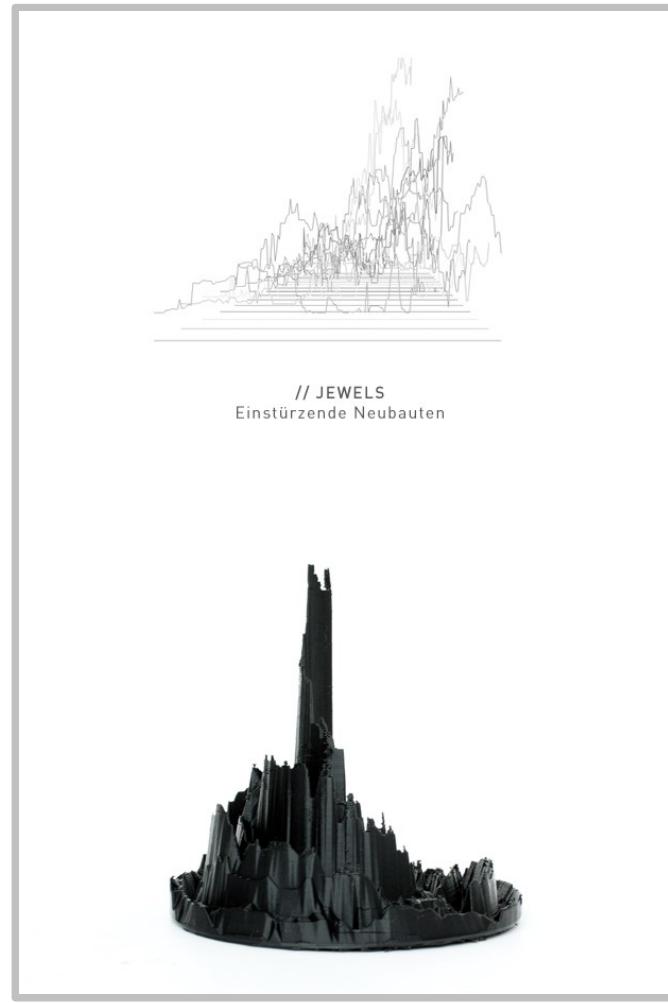
// JEWELS  
Einstürzende Neubauten



Digital Fabrication can be used for rendering visible and physical intangible data and concepts.

Source: <http://www.realitat.com/microsonic/>

# Physical Data Visualization



Digital Fabrication can be used for rendering visible and physical intangible data and concepts.

Source: <http://www.realitat.com/microsonic/>

# Mass Customization



Mass customization can be enabled in an easier way with digital fabrication technologies (and places for interacting with customers).

Source: <http://nikeid.nike.com/nikeid/>

# Custom Prosthetics



Building customized prosthetics, at home!

Source: <http://youtu.be/WoZ2BgPVtAO>

[http://www.core77.com/blog/digital\\_fabrication/wrex\\_3d\\_printed\\_magic\\_arms\\_and\\_the\\_future\\_of\\_pediatric\\_prosthetics\\_23101.asp](http://www.core77.com/blog/digital_fabrication/wrex_3d_printed_magic_arms_and_the_future_of_pediatric_prosthetics_23101.asp)

# Custom Low-cost Prosthetics

The  
Low Cost  
Prosthesis

Contact FAQ

[home](#)   [the need](#)   [what we do](#)   [partners](#)   [blog](#)



Elements of the Low Cost Prothesis

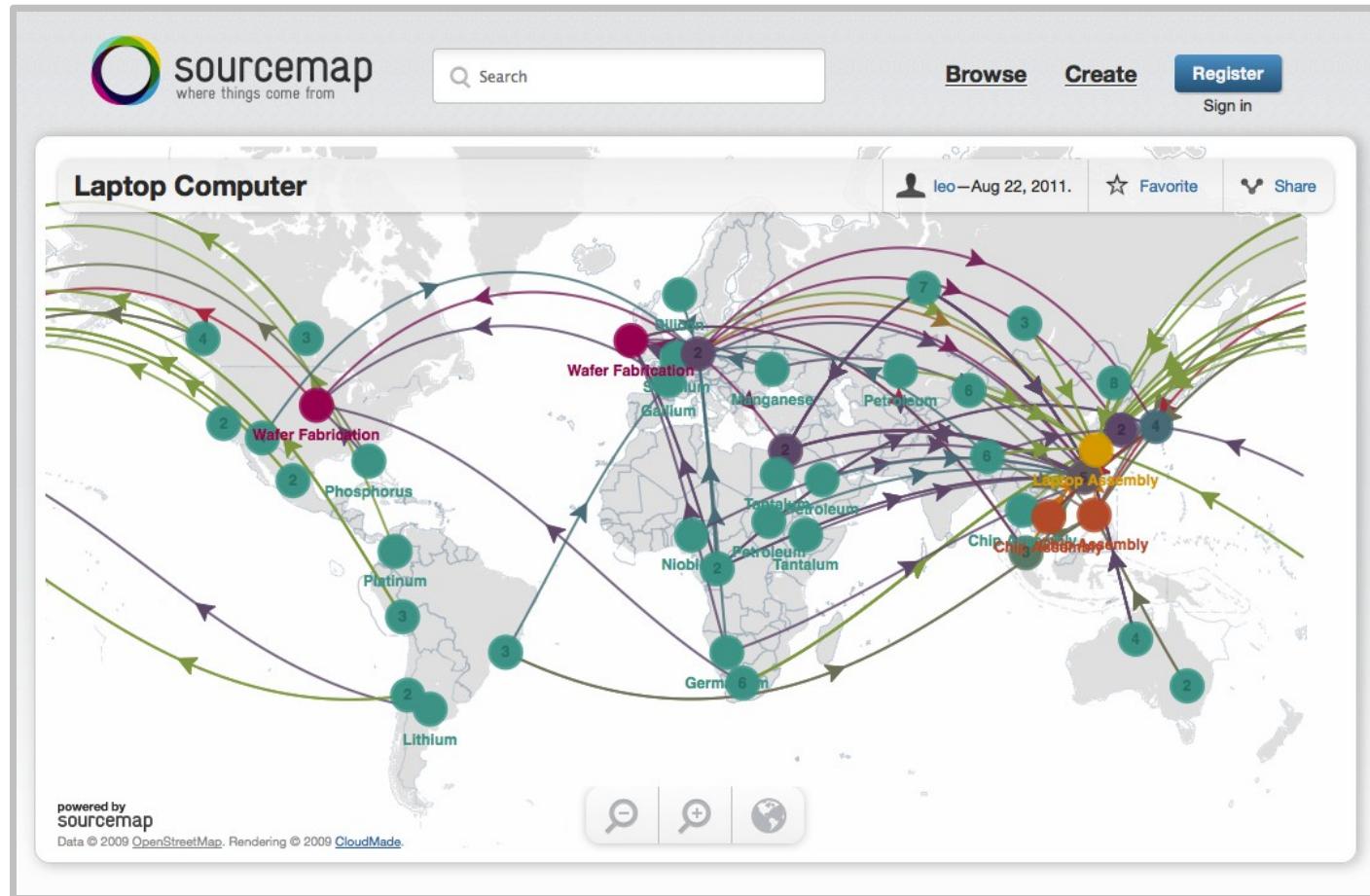
... ● ● ● ...

The Low Cost Prosthesis project aims at developing a lower leg prosthetic with production costs below \$50. An important cause, because the need for prostheses is growing and the costs are often high. Due to the increasing rate of amputations, there is an ever-growing demand for prosthetic limbs.

Building low-cost customized prosthetics, at home, from FabLab Amsterdam.

Source: <http://www.lowcostprosthesis.org/>

# Shorter and more sustainable supply chains



Visualizing and redesigning supply chains,  
through open source and open data software.

Source: <http://www.sourcemap.com>

# Instead, what cannot we do?

*DEFENSE DIST.* :

NEWSLETTER SUBSCRIPTION

bitcoin ACCEPTED HERE

f t

HOME OF THE WIKI WEAPON

OUR PLAN FAQ ABOUT US THE GUNS EVENTS MEDIA BLOG WIKI CONTEST

The Wiki Weapon Share More info

WATCH VIDEO

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HOME OF THE WIKI WEAPON. A COLLABORATIVE PROJECT TO CREATE FREELY AVAILABLE PLANS FOR 3D PRINTABLE GUNS.

DONATE



printablegun.com

The rise of 3D printed weapons, but you cannot build them in a FabLab (it's against the Fab Charter).

Source: <http://defensedistributed.com/>

# Instead, what cannot we do?

DESIGN | product design | miscellaneous | apocalypse prep

## Looks Could Kill: Using 3-D Printers to Design Guns

BY JOSEPH FLAHERTY [✉](#) 08.10.12 7:45 AM

Like 55 Tweet 66 +1 7

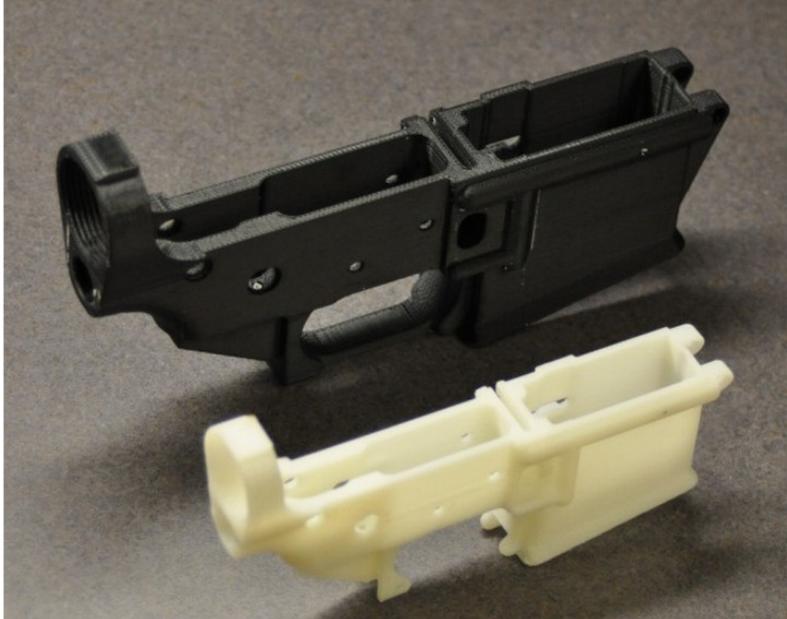


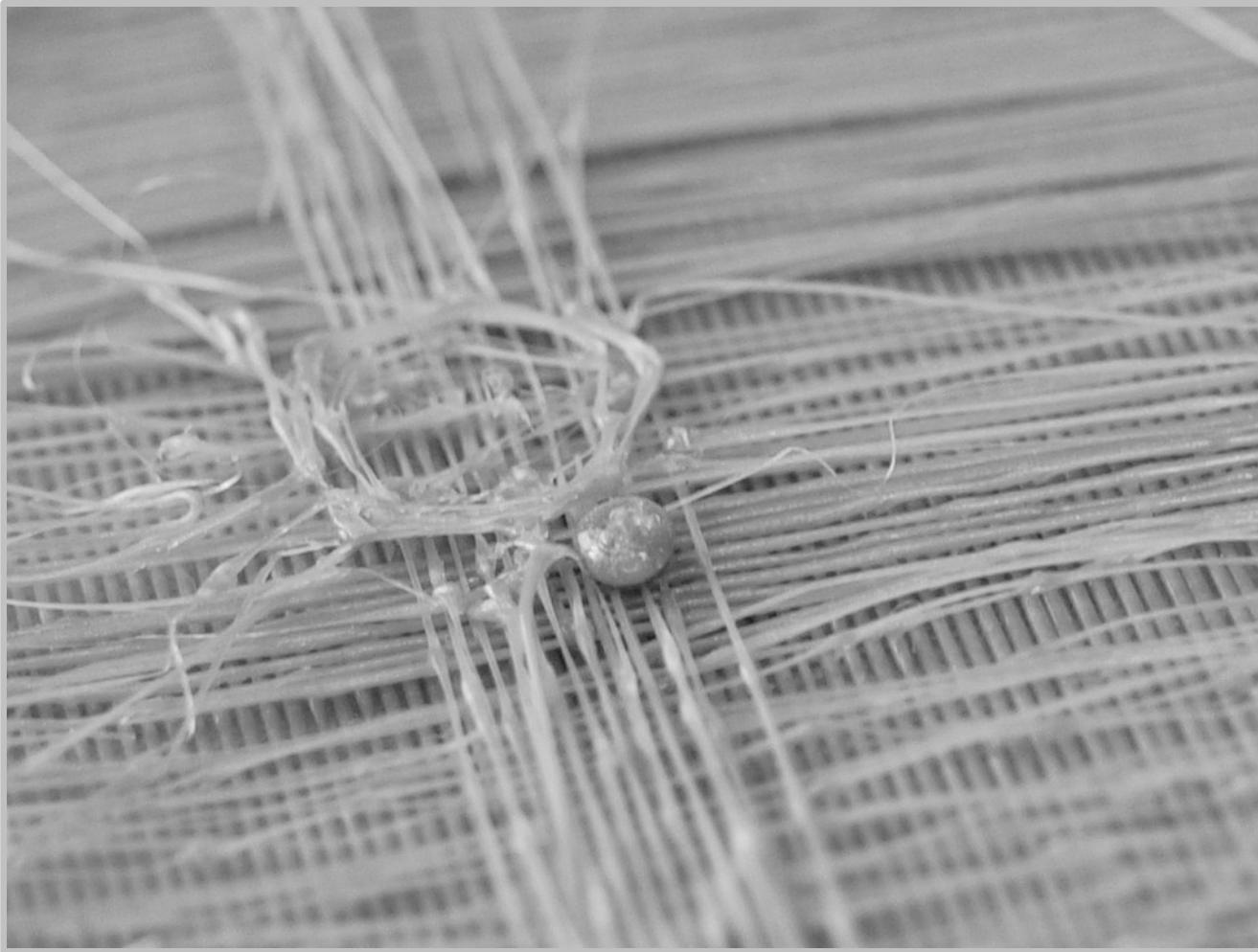
Photo: Courtesy Michael Guslick/Haveblue.org

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The rise of 3D printed weapons, but you cannot build them in a FabLab (it's against the Fab Charter).

Source: <http://www.wired.com/dangerroom/2012/08/3d-weapons/>  
<http://www.wired.com/design/2012/08/rapid-fire-rapid-prototypes/>

# Fabbing and Media



---

Digital Fabrication can be used in different media: photography of failed 3D prints.

Source: <http://cunicode.com/beautiful-failures/>

# Fabbing and Media

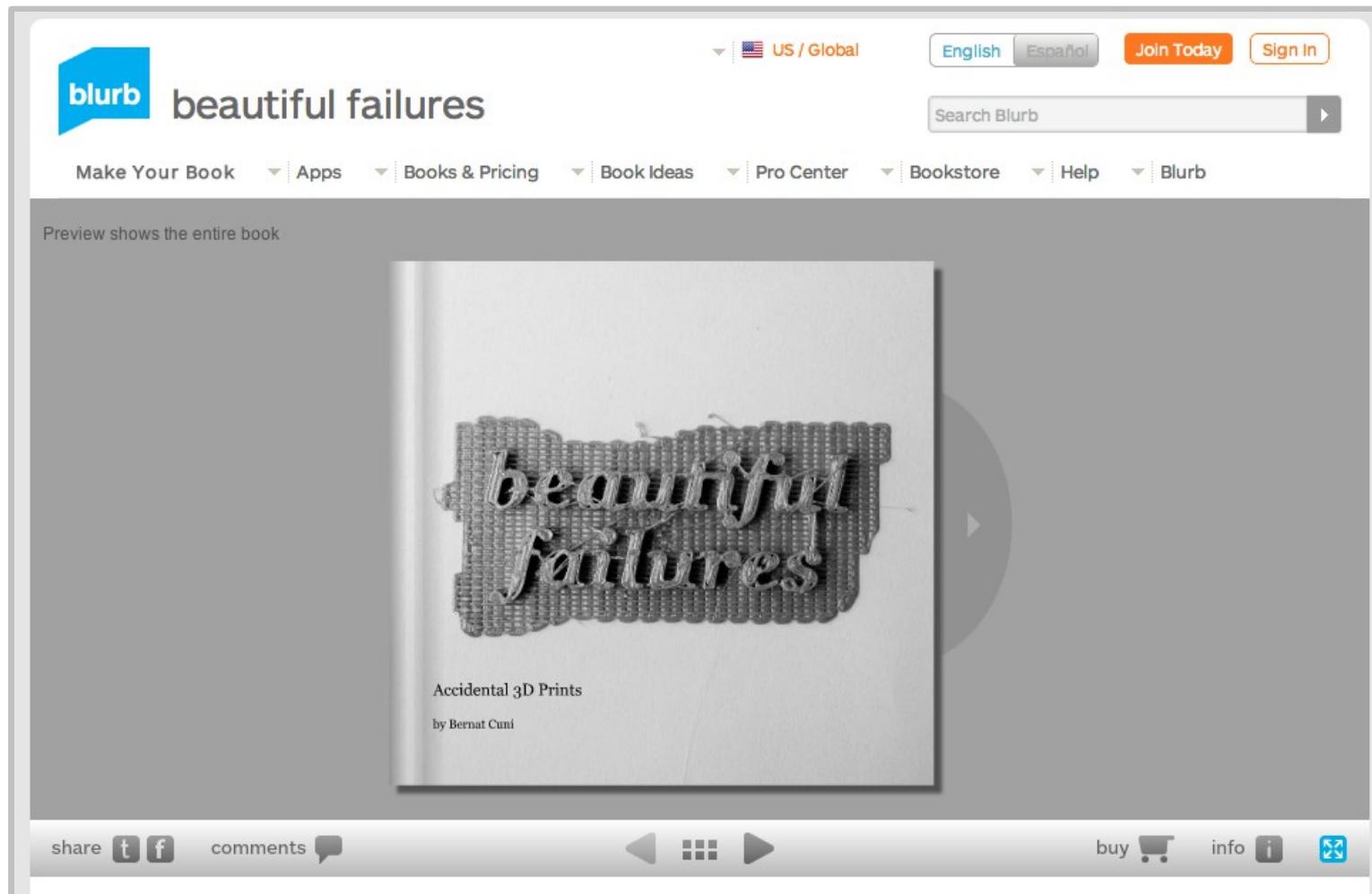


---

Digital Fabrication can be used in different media: video of failed 3D prints.

Source: <http://cunicode.com/beautiful-failures/> <http://vimeo.com/42537804>

# Fabbing and Media



Digital Fabrication can be used in different media: book of failed 3D prints.

Source: <http://cunicode.com/beautiful-failures/> <http://www.blurb.com/books/3248225>

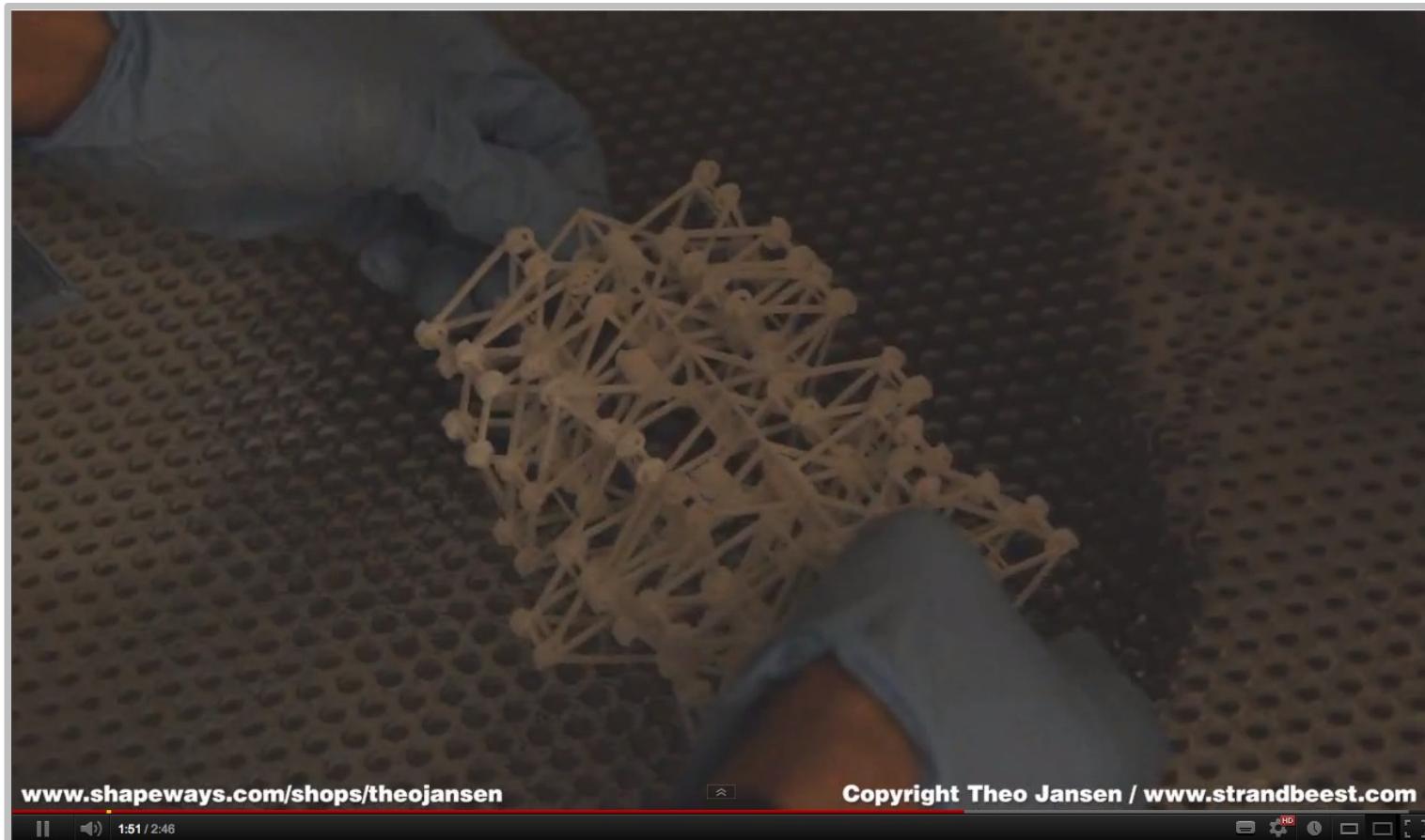
# Same project, different media



Digital Fabrication can be also thought as a medium for converting one project to a different format.

Source: <http://www.3ders.org/articles/20120820-theo-jansen-3d-printed-strandbeests-here-are-the-lego-and-bamboo-version.html>  
<http://youtu.be/HSKyHmjyrkA>

# Same project, different media



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<http://youtu.be/pZr-zyHRBn4>

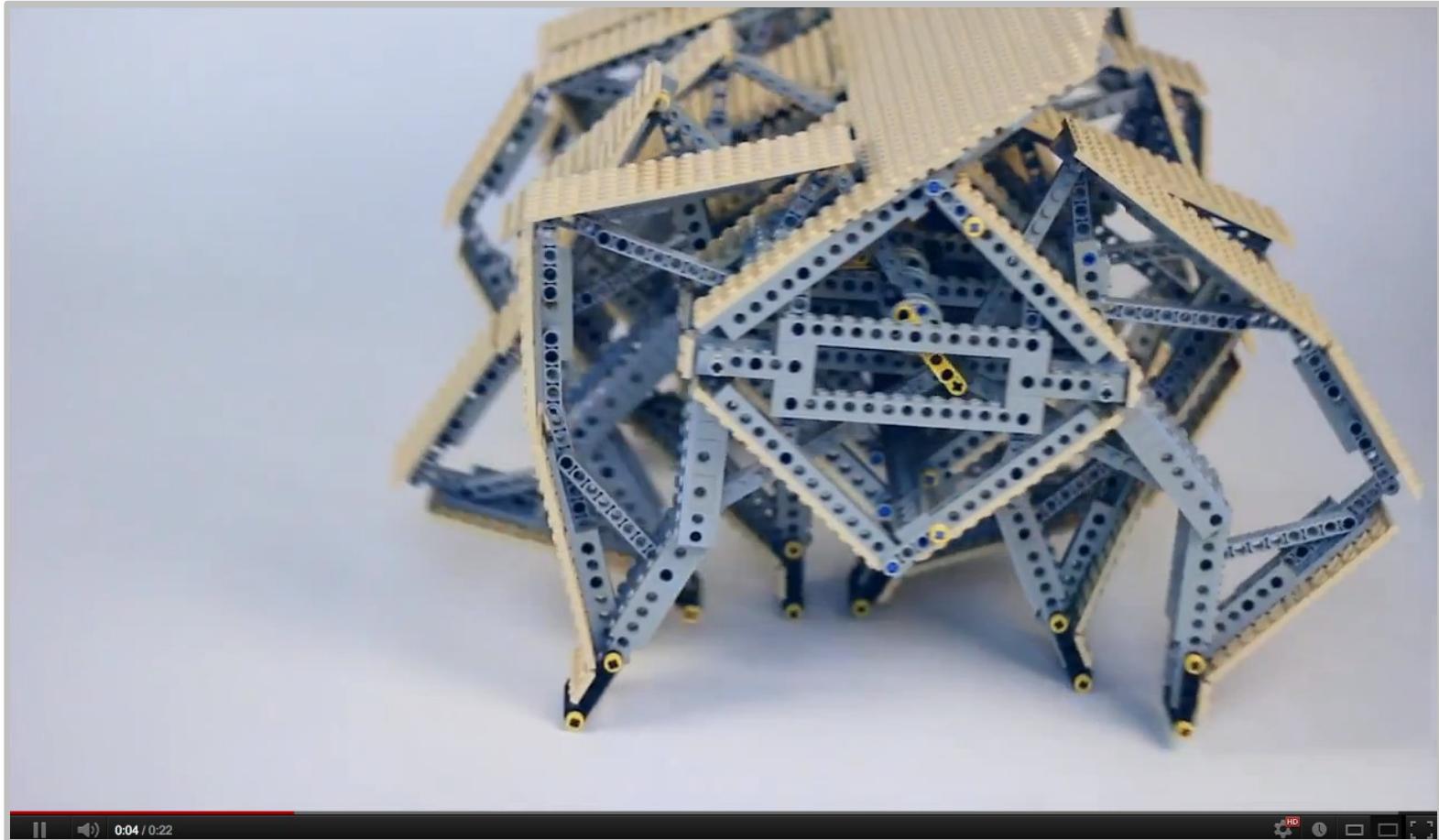
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<http://youtu.be/NfutNEauniE>



Aalto University  
Media Factory

04.

# Other spaces and services: making digital fabrication even more accessible

# Hackerspaces / Makerspaces

hackerspaces

Page Discussion View source History

**Hackerspaces**

Communication

Active hackerspaces

ALL hackerspaces

> add a hackerspace

List of events

> add an event

List of projects

> add a project

Recent changes

Go Search

What links here

Related changes

Special pages

Printable version

Permanent link

Browse properties

**List of Hacker Spaces**

This is a comprehensive, user-maintained list of all active hackerspaces throughout the world.

We have also a [list of planned Hacker Spaces](#), as well as a [list of ALL hackerspaces](#) around the globe - including those still in bu



If we're missing your space, or you want and/or are about to create a new one, please [add yourself](#) to the list.

hackerspace	Country	State	City	Website
BAH	Argentina	Buenos Aires	Capital Federal	<a href="http://www.hackerspace.com.ar">http://www.hackerspace.com.ar</a>
Toylab	Argentina	Buenos Aires	Capital Federal	<a href="http://toylab.wordpress.com/">http://toylab.wordpress.com/</a>
MatesLab	Argentina	Buenos Aires	Mar del Plata	<a href="http://www.mateslab.com.ar">http://www.mateslab.com.ar</a>

Hackerspaces are open community labs with machine shops, workshops and/or studios where hackers can share resources and knowledge.

Source: [http://hackerspaces.org/wiki/List\\_of\\_Hacker\\_Spaces](http://hackerspaces.org/wiki/List_of_Hacker_Spaces)

# Helsinki Hacklab

## Helsinki Hacklab

Yhteisöllinen työpaja Helsingissä

Home    Helsinki Hacklab    Tilan esittely    Liity Jäseneksi    Tapahtumat    Yhteystiedot

### Sunnuntaina 6.5. Ommeltavan elektroniikan työpaja

Posted on **30.4.2012** by **anacron**

Sunnuntaina 6.5. pidetään Helsinki Hacklabilla ommeltavan elektroniikan työpaja. Alkaen klo 12 osoitteessa: Nilsiänkatu 10 B.

Ohjelmassa on luvassa elektroniikan alkeita ja tarkoituksena on myös omalla johtavaa, joka sitten vilkkuu tai vaikka piipittää. Mukana menossa myös Arduino (+ Lilypad) sekä kooste kiintoisista e-textile projekteista, joita voidaan yhdessä ihmetellä ja ideoida jotain vielä hienompaa...



IN ENGLISH

- English summary
- In English

LINKS

-  Facebook
-  GitHub
- IRC
- Kalenteri
- Kirjoitusalusta
-  Muita hackerspaceja
-  Twitter
- Wiki

RECENT POSTS

- Sunnuntaina 6.5. Ommeltavan

The local hackerspace...

Source: <http://helsinki.hacklab.fi/>

# Sewing Café

The screenshot shows the homepage of The Sewing Café website. At the top left is the logo featuring a sewing machine icon and the text 'THE SEWING CAFE' with the subtitle 'the social sewing emporium'. To the right are contact details: email 'hello@thesewingcafe.co.uk' and phone 'T: 01455 698034'. Below the logo is a navigation bar with links: Home, Sew by the Hour, Workshops, Sew help me!, Shop at the Sewing Café, About Us, How to get in Touch, and Register. The main content area features several images: a brown tag with the 'THE SEWING CAFE' logo; a wooden tray filled with colorful spools of thread in various colors like yellow, green, blue, orange, red, pink, and white; a close-up of a piece of fabric with a red rose pattern; and a roll of pink and white floral fabric. A teal circular graphic in the center says 'WELCOME to THE SEWING CAFE'. At the bottom right are social media icons for Flickr, Facebook, and Twitter.

THE SEWING CAFE  
the social sewing emporium

E: hello@thesewingcafe.co.uk  
T: 01455 698034

Home | Sew by the Hour | Workshops | Sew help me! | Shop at the Sewing Café | About Us | How to get in Touch | Register

VISIT US FOR...

- Sewing Workshops
- Sew by the hour
- Social Sewing
- Sewing Parties
- Inspiration & Advice

Plus a shop full of beautiful fabrics and haberdashery

WELCOME to THE SEWING CAFE

flickr    f    twitter

A coworking space with sewing and embroidery machine (usually pay per hour)

Source: <http://www.thesewingcafe.co.uk/>

# Techshop (USA)

The screenshot shows the TechShop USA website. At the top, there's a banner with the TechShop logo and the tagline "BUILD YOUR DREAMS HERE". To the right of the logo is the slogan "WHAT DO YOU WANT TO MAKE?™". On the far right, there's a "CAREERS" section with a "Click here for more information" link. The left sidebar contains links for Welcome, Membership, Classes, Events, Facilities & Amenities, TechShop Locations (which is highlighted with a blue background), Equipment Reservation, Calendars, Services, Member Project Gallery, FAQs, TechShop News, Contact Us, and Forum. The main content area features a heading "TechShop Locations" followed by a paragraph about available locations. Below this is a bulleted list of TechShop locations with their status: Menlo Park (Open Now), RDU (Open Now), San Francisco (Open Now), San Jose (GRAND OPENING SATURDAY SEPT 24, 10 AM - 6 PM), Detroit (Under Construction Fall 2011), Portland (In Planning), New York (In Planning), and Los Angeles (In Planning). To the right, there are two boxes: one for "UPCOMING EVENTS @ TechShop" featuring the San Jose Grand Opening on September 24, and another for learning Autodesk Inventor for free.

**UPCOMING EVENTS @ TechShop**

**San Jose**

300 South 2nd Street  
San Jose, CA 95113

**September 24:**  
TechShop San Jose  
Grand Opening!

**Click for More Details**

**Learn how to use Autodesk Inventor FOR FREE**

A network of commercial spaces with many tools and technologies and paid support services (only in USA).

Source: <http://techshop.ws/>

# Techshop (USA)

## Ford + TechShop: Getting Employees to Tinker

BY JOSEPH FLAHERTY

05.14.12 3:20 PM



CNC router carving the Ford logo at TechShop.

*Before he invented the assembly line, Henry Ford built his first prototype on a workbench in a shed. More than a century later, his company has partnered with [TechShop](#), Detroit, the 21st-century equivalent of that shed, with a bold program to ignite innovation in the company.*

Ford employees who invent something that the company ends up patenting receive a free three-month membership to TechShop.

Source: <http://www.wired.com/design/2012/05/ford-techshop/>

# 100k Garages (USA)

The screenshot shows the homepage of 100kGarages.com. At the top left is a 3D illustration of a garage with a person inside. Next to it is the website's logo, "100kGarages.com" in a large, bold, black font inside a white rounded rectangle, with the tagline "connect. collaborate. create." below it. To the right is a horizontal row of small 3D house icons. In the top right corner are links for "sign up or log-in". Below the header is a yellow navigation bar with links for Home, About, Participate, Create/Design, Inspiration, Connect, and a search bar with a "Google Custom Search" button. On the far right of the bar is a "Request Project Bids" button. The main content area features a large image of several colorful, modern wooden furniture pieces (chairs and tables) against a window. Below this image is a text block: "Be inspired. Take a look at these cool creations from 100kGarages users. And sample the work of designers who make their plans available for use. It's all at our [Inspiration gallery](#)." To the right of this is a section titled "Got an idea? Get it made." with the subtext: "100kGarages connects you with Fabbers who can turn your thoughts into things." It includes a circular graphic with a cartoon character, a heart, and a table, with the text "100kGarages.com" and "How it Works" around it, and a "learn more" link. Further down, there's a paragraph about the service, a "ShopBot" logo, and a "Make:" logo.

sign up or log-in

100kGarages.com  
connect. collaborate. create.

Find Designers Find Fabbers Request Project Bids

Home About Participate Create/Design Inspiration Connect Google™ Custom Search Search

Got an idea? Get it made.

100kGarages connects you with Fabbers who can turn your thoughts into things.

100kGarages.com is a place for people who have designs, or just ideas for things they want to make, to connect with digital fabricators ("Fabbers") who can help make these ideas become real.

Our participating Fabbers work with 2-D or 3-D digital fabrication tools to cut, machine, drill, sculpt, or "print" in 3-D. Our "matchmaking" service can help you find a Fabber near you, and it's free. [Learn more and get started.](#)

I have an idea. What's Next?  
I need an idea. Show me cool stuff.

created by

**ShopBot**

our sponsors

**Make:**

100kGarages is a place for people who have designs (or just ideas) to connect with digital fabricators ("Fabbers") who can help make these ideas.

Source: <http://100kgarages.com/>

# Maker Factory

The screenshot shows the homepage of the Maker Factory website. At the top left is the logo 'MAKER FACTORY' with a stylized orange factory icon. To the right are 'LOGIN' and 'LOGOUT' buttons, and links for 'POST A JOB' and 'FIND A JOB'. Below the header is a photograph of two people working on a geodesic dome made from 3D printed connectors. A caption below the photo reads: 'GEODESIC DOME MADE FROM 3D PRINTED CONNECTORS PRINTED WITH MAKERFACTORY'. To the right of the photo is a text box: 'MAKERFACTORY is a free service for connecting the emerging network of localized fabrication technologies with people like you who need stuff 3d printed, CNC'ed, or otherwise made.' Below this is a yellow button labeled 'REGISTER HERE'. A call-to-action text follows: 'Need something made? Willing to make things for other people? Click here to register for an account. It's totally free!' At the bottom is a world map with a red location pin over North America. A vertical zoom control is on the left side of the map.

The same service as 100kgarages, but open source ...

# Seoul (South Korea)



No FabLabs or similar places, but many small manufacturers that will produce you small-scale series very quickly.

# Living Labs (USA, Europa)

**European Network of Living Labs**

**The European Network of Living Labs**  
– the first step towards a new Innovation System!

Login or Sign up!



**news**

**ENoLL 6th Wave is open – Join our growing community!**

SUBMITTED BY ENoLL ON MON, 2011-10-24 17:53

All organisations public and private from all countries in the world, actively committed to engage and empower users and citizens to take part in sustainable innovation processes, are once again invited to apply for membership in the European Network of Living Labs (ENoLL) as of October 24th, 2011. The announcement was made at the Future Internet Conference in Poznan (Poland).

You can see the session 'User Driven Innovation – Shaping the Future Internet for a Better Society' including the announcement of the 6th Wave here.

[Read more](#)

**on the map**



A map of Europe with icons indicating the locations of different waves of living labs. The legend shows:

- First Wave Living Labs (light gray circle)
- Second Wave Living Labs (dark gray circle)
- Third Wave Living Labs (red circle)
- Fourth Wave Living Labs (yellow circle)

Icons at the bottom left indicate zoom and search functions.

Spaces for co-designing products and services with users... not necessarily with digital fabrication.

Source: <http://www.openlivinglabs.eu/>

# National Additive Manufacturing Innovation Institute (USA)

the WHITE HOUSE PRESIDENT BARACK OBAMA

★★★★★ ★★★★★



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For Immediate Release August 16, 2012

## We Can't Wait: Obama Administration Announces New Public-Private Partnership to Support

*Consortium of Businesses, Universities, and Community Colleges from Ohio, West Virginia and Pennsylvania Co-Invest with Federal Government in a Manufacturing Innovation Institute*

WASHINGTON, DC – Following through on our We Can't Wait efforts, the Obama Administration today announced the launch of a new public-private institute for manufacturing innovation in Youngstown, Ohio as part of its ongoing efforts to help revitalize American manufacturing and encourage companies to invest in the United States. This new partnership, the National Additive Manufacturing Innovation Institute (NAMII), was selected through a competitive process, led by the Department of Defense, to award an initial \$30 million in federal funding, matched by \$40 million from the winning consortium, which includes manufacturing firms, universities, community colleges, and non-profit organizations from the Ohio-Pennsylvania-West Virginia 'Tech Belt.'



**VIEW THE INFOGRAPHIC**

**BLOG POSTS ON THIS ISSUE**

September 08, 2012 5:30 AM EDT  
[Weekly Address: Coming Together to Remember September 11th](#)

The institute will ensure that the U.S. manufacturing sector is a key pillar in an enduring and thriving economy.

# Anywhere...

## DREAM Vendor



A vending machine with 2 3D printers at Virginia Tech's College of Engineering.

Source: <http://youtu.be/c1MhNLGi-5I>

# A”

Aalto University  
Media Factory

# Thank you!!

Massimo Menichinelli  
Aalto Media Factory  
[massimo.menichinelli@aalto.fi](mailto:massimo.menichinelli@aalto.fi)  
[@openp2pdesign](https://twitter.com/openp2pdesign)  
<http://www.slideshare.net/openp2pdesign>

