

FABO ACADEMY X

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# WHAT IS A FABLAB? 什么是FABLAB?

# THE FABLAB NETWORK



Massachusetts  
Institute of  
Technology



## HOW IT STARTED 它是怎么开始的？

PROF. NEIL GERSHENFELD, DIRECTOR OF THE CENTER FOR BITS AND ATOMS  
尼克·杰森非尔教授，原子与比特中心主任



**Massachusetts  
Institute of  
Technology**



**Center for Bits and Atoms**  
**Physical Science +**  
**Computer Science**



**Prof. Neil Gershenfeld**  
Director of the Center  
for Bits and Atoms  
at MIT



## HOW IT STARTED 它是怎么开始的？

MIT (MASSACHUSETTS INSTITUTE OF TECHNOLOGY)  
CENTER FOR BITS AND ATOMS  
MIT (麻省理工学院) 原子和比特中心

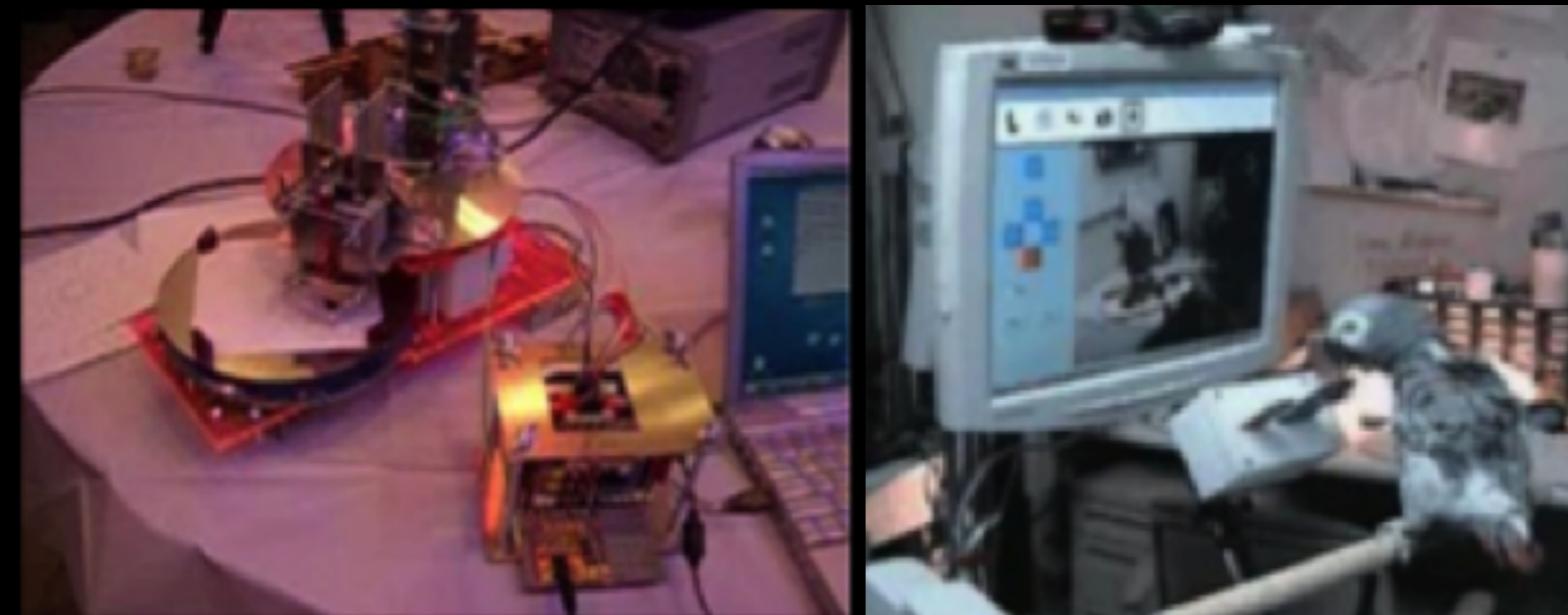
FABO ACADEMY X

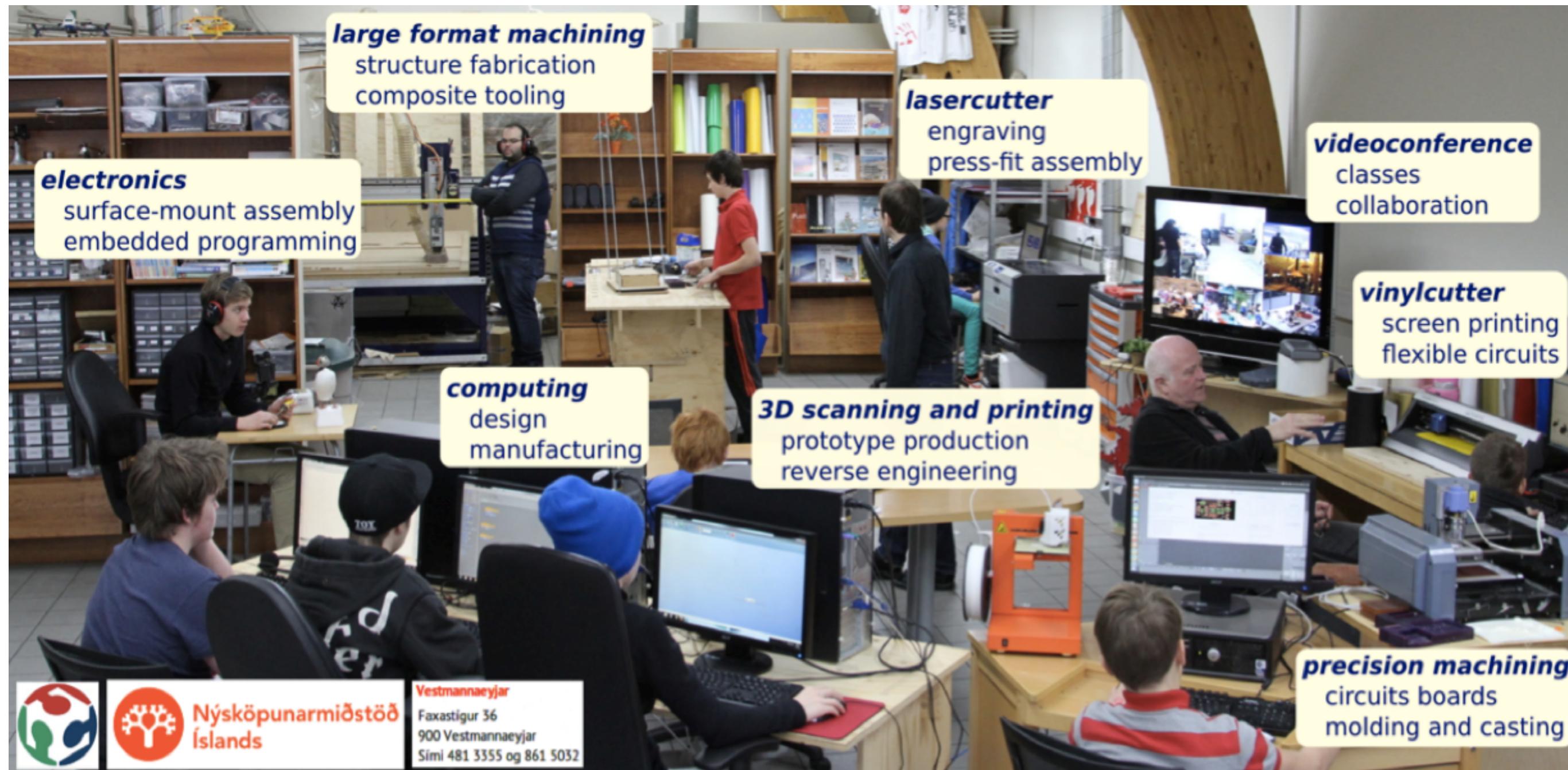


# How to Make (almost) Anything

## CLASS @ MIT

Date	Subject
9/10	<a href="#">Design Tools, Input Devices</a>
9/24	<a href="#">Machining</a>
10/1	<a href="#">3D Printing, NC machining</a>
10/15	<a href="#">Laser, Water Jet, NC Knife Cutting</a>
10/22	<a href="#">Materials and Finishes</a>
10/29	<a href="#">Forming and Molding</a>
11/5	<a href="#">Basic Electronics</a>
11/12	<a href="#">ECAD</a>
11/19	<a href="#">Sensor Technology</a>
11/26	<a href="#">Programmable Logic</a>
12/3	<a href="#">Microcontrollers</a>
12/10	<a href="#">Wired &amp; Wireless Communications</a>





Nýsköpunarmiðstöð  
Íslands

Vestmannaeyjar  
Faxastigur 36  
900 Vestmannaeyjar  
Sími 481 3355 og 861 5032

# HOW IT STARTED

## WHAT IS A FABLAB?

- A SPACE ABOUT **BITS AND ATOMS**
- PART OF A **NETWORK**
- A LOCAL AND GLOBAL **COMMUNITY**
- A SET OF **TOOLS**
- A SET OF **KNOWLEDGE**
- A SET OF **PROCESSES**
- A **SERVICE**
- NOT A FRANCHISING
- A **BUSINESS**
- A CONCEPT CURRENTLY **UNDER DEVELOPMENT**

它是怎么开始的？

## 什么是FABLAB?

- 一个关于原子和比特的空间
- 一个属于网络的节点
- 一个全球化与本地化联动的社区
- 一系列的工具
- 一套知识体系
- 一系列的过程
- 一种服务
- 不是一个连锁店
- 一种商业行为
- 一个函待拓展的概念

# HOW IT STARTED / 它是怎么开始的？

## THE FAB CHARTER FAB章程

- **WHAT IS A FAB LAB?**

Fab labs are a global network of local labs, enabling invention by providing access to tools for digital fabrication.

- **什么是FAB LAB?**

FAB实验室是一个由全球各地的本地实验室聚合的网络系统，通过提供数字制造工具来实现智造发明。

- **WHAT'S IN A FAB LAB?**

Fab labs share an evolving inventory of core capabilities to make (almost) anything, allowing people and projects to be shared.

- **FAB LAB里面有什么？**

FAB实验室里有一套持续进化的核心内容，让大家可以利用这些知识几乎可以造出所有的东西，并进行分享。

- **WHAT DOES THE FAB LAB NETWORK PROVIDE?**

Operational, educational, technical, financial, and logistical assistance beyond what's available within one lab.

- **FAB实验室网络可以提供什么内容呢？**

提供在单一的实验室内部无法实现的操作、教育、技术、财务和思维辅导、辅助。

# HOW IT STARTED / 它是怎么开始的？

## THE FAB CHARTER FAB章程

- **WHO CAN USE A FAB LAB?**

Fab labs are available as a community resource, offering open access for individuals as well as scheduled access for programs.

- **谁能使用FAB实验室呢？**

FAB实验室作为可用的社区资源，为个人及项目提供可预约的开放访问。

- **WHAT ARE YOUR RESPONSIBILITIES?**

safety: not hurting people or machines

operations: assisting with cleaning, maintaining, and improving the lab

knowledge: contributing to documentation and instruction

- **你的职责是什么？**

安全：不要伤到他人或破坏机器

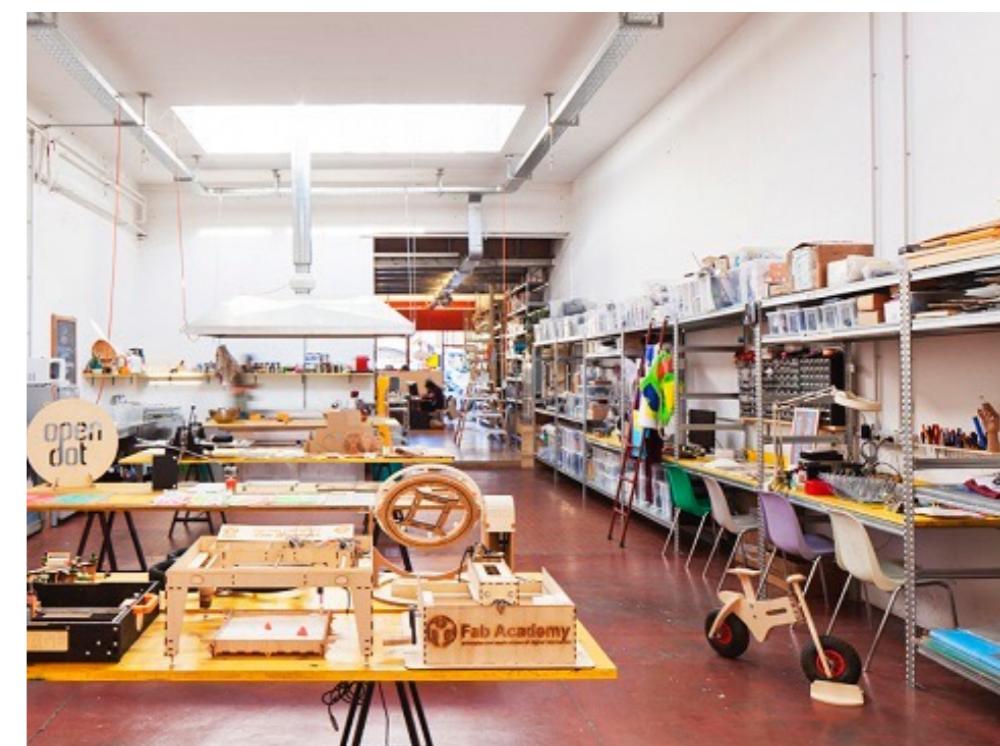
操作：保持实验室的整洁性，一同创造更好的实验室

知识：共享文件与说明的编撰



2002: First FABLAB opened in Vigyan Ashram, rural India

2019: More than 2000 FABLABS worldwide



## WHAT IT IS NOW 现在的进展?

ONLINE COMMUNITY THROUGH VIDEO STREAMING, SHARE DESIGN AND KNOWLEDGE BETWEEN LABS,  
EACH LAB HAS A SIMILAR SET OF OPEN SOURCE TOOLS.

线上社区通过实时视频交流，在不同的实验空间分享设计和知识，每个实验室都有一套相似的开源工具。



Laser cutter

镭射切割机



(Small) CNC  
Milling machine

(小型) CNC切削机



Vinyl cutter

刻字机



3D Scanner

3D 扫描仪



3D  
printing

3D 打印机



Digital  
sewing /  
embroidery

数字缝纫机



(Big) CNC  
Milling machine

(大型) CNC切削机



Electronics  
(custom PCBs,  
Arduino)

电子元件 (定制PCB板、Arduino版)

## WHAT IT IS NOW 现在的进展?

EVERY FABLAB HAS THE SAME STANDARD SET OF MACHINES. YOU CAN EASILY MAKE THE SAME PROJECT EVERYWHERE IN THE WORLD.

每个FAB都有一套同样标准的机器设备。你可以轻而易举地在全球任何地方的FAB里智造相同的项目。

## “HOW TO MAKE (ALMOST) ANYTHING”



15 students @ MIT



“FAB ACADEMY”

250+ students in the Fab Lab Network



Prof. Neil Gershenfeld



# WHAT IT IS NOW 现在的进展?

FAB ACADEMY: A DIGITAL FABRICATION COURSE / 全球智造学术：一个数字智造的课程  
EVERY FAB LAB IS A CLASSROOM IN THE NETWORK  
通过网络，每个FAB实验室都成为了教室的物理载体。

FABO ACADEMY X





## WHAT CAN YOU MAKE IN A FABLAB? 你可以在FAB实验室智造什么？

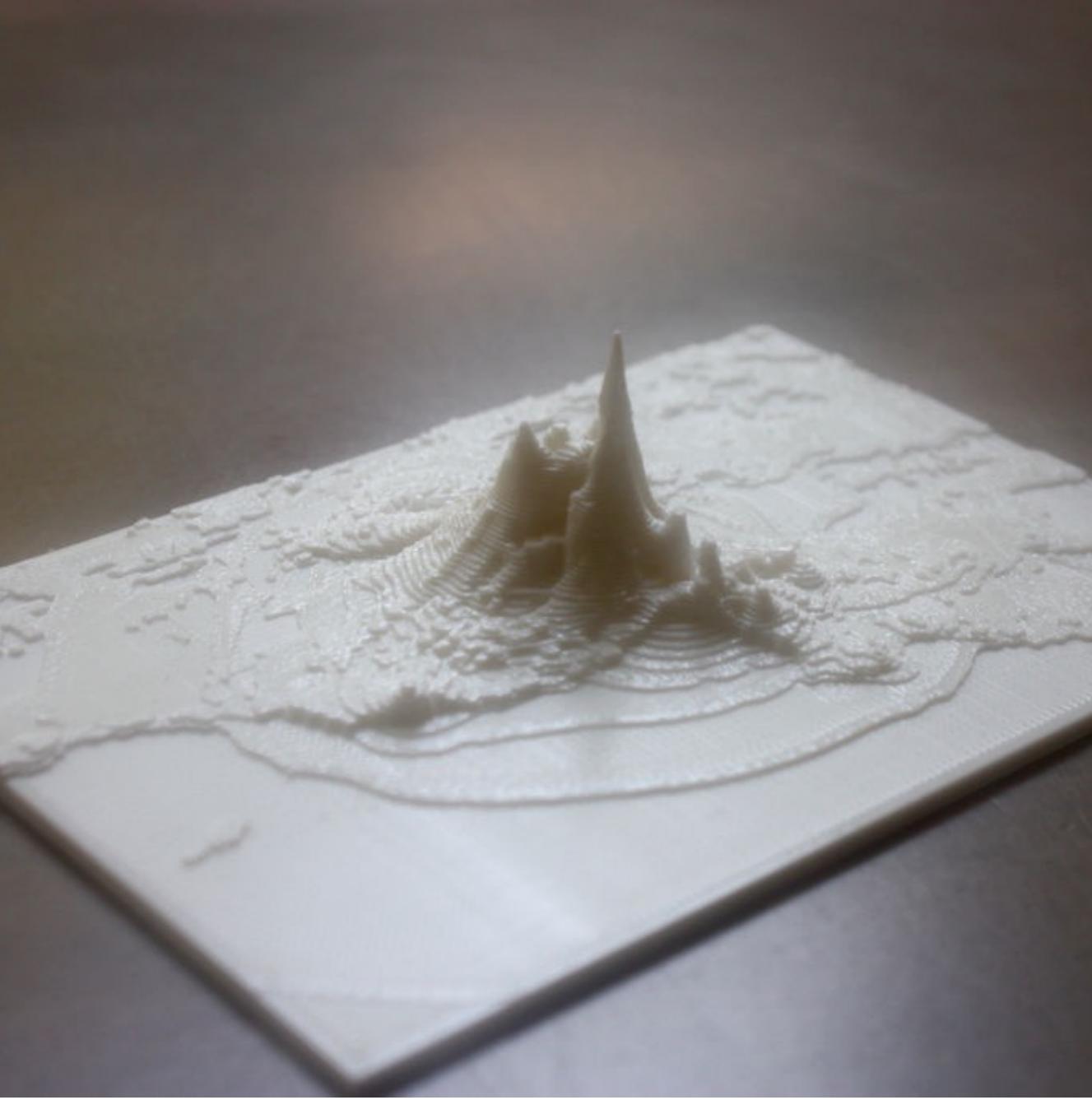
- Do-It-Yourself projects / 做你自己DIY的项目
- Repairs and replacement parts / 修理和更换零件



## WHAT CAN YOU MAKE IN A FABLAB? 你可以在FAB实验室智造什么？

- Custom Prosthetics, custom aids for impaired people / 定制义肢，为残障人士提供定制帮助
- Custom bikes / 定制自行车

<http://www.opendotlab.it/it/content/loggetto-che-non-c%C3%A8>



## WHAT CAN YOU MAKE IN A FABLAB?

你可以在FAB实验室智造什么？

- Data Visualization / 可视化数据
- Fashion Products / 时尚产品

# Coffee Capsule Vending machine

Hyebin Goo

Fab Lab Seoul

Increasing number of people are enjoying capsule coffee machine but!

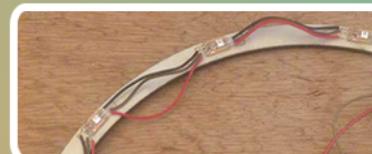
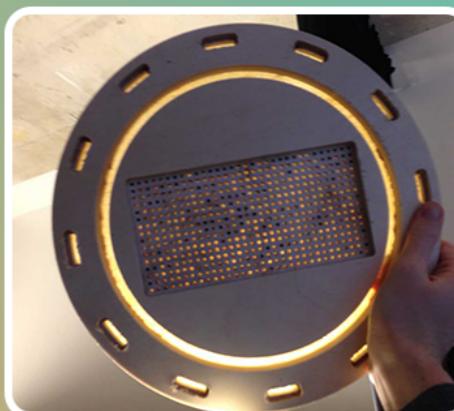
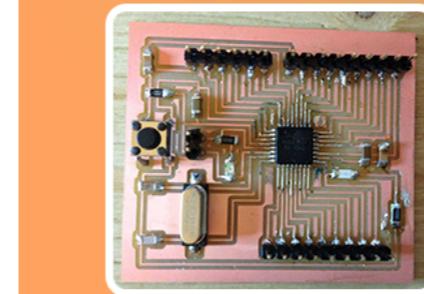
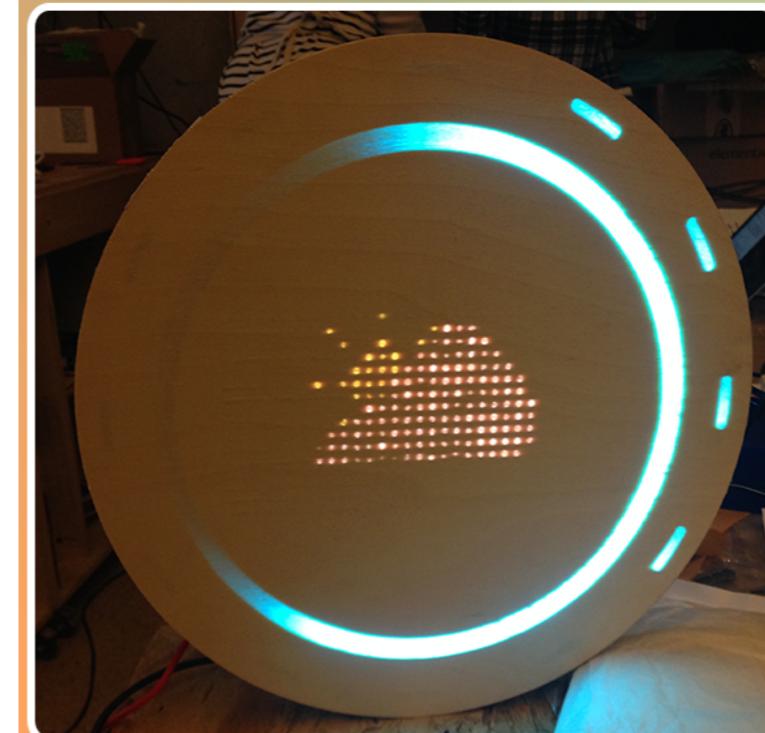
Did you know that there are more than 30 different types of capsules? (I'm only talking about Nespresso here) We consume lot of coffees but people just don't care about the flavors.

This vending machine will let you keep the capsules in each different container and make you easy to select the capsule you want.



## SMART CLOCK

A backlit wooden clock that tells the weather



- WiFi connection using ESP8266
- API communication for weather data
- TIME DISPLAY : RGB addressable LED matrix on fab-made PCBs and attached to plywood rings
- WEATHER DISPLAY : RGB LED matrix
- Birch plywood casing CNC machined translucent (0.65mm)
- Microcontroller : Daniele Ingrassellato

## WHAT CAN YOU MAKE IN A FABLAR?

你可以在FAB实验室智造什么？

- A Coffe Capsule Dispenser / 咖啡胶囊售卖机
- A Smart Clock / 智能钟

# gun designed for shooting game



Fablab O  
“数制”工坊

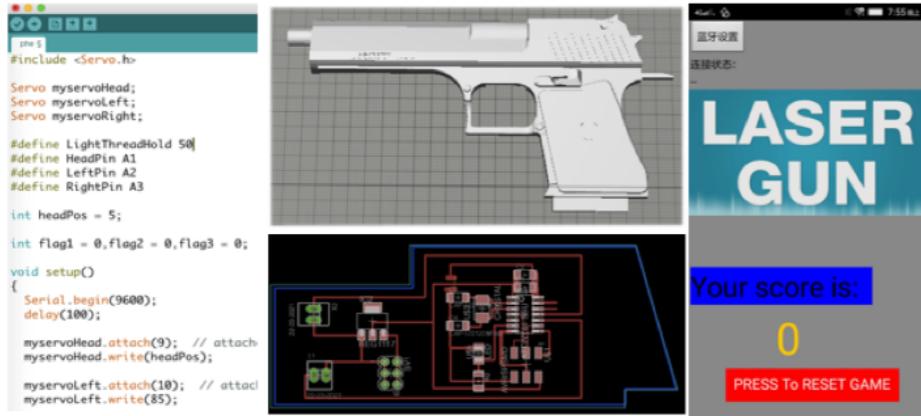
ei (Vincent)



gn & printing

Laser and servo  
ight sensor  
ed programming

h Communication  
rogramming



It's a 3D printed gun integrates with a laser controlled by MCU. And on the target side, there is a laser receiver that can sense the laser shooting, then control servo and send score to Android APP via Bluetooth.

Ambhika Jib Samsen  
Fablab Opendot, Milan

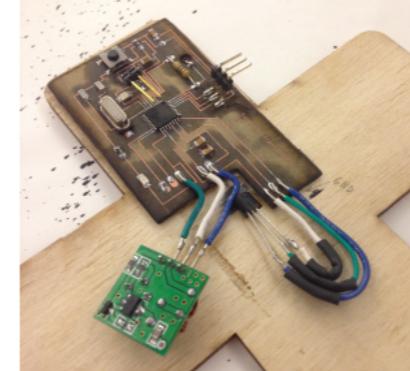
## Paul

The prophecy generator

Paul is a predictive domestic robot.  
Whenever you need an answer, ask Paul.  
Paul will give you signs, a hint to your life. He  
does not give you exact words but you are  
the one who interpret.



PCB on the back of the cross takes hand  
temperature as input for seed random



Prophecy gallery



Features  
- unique, ir  
prediction  
- SCARA-in  
movement  
- extra-art  
surface

Butterfly ne



# WHAT CAN YOU MAKE IN A FABLAB? 你可以在FAB实验室智造什么？

- A Toy Laser Gun / 玩具激光枪
- A Profecy Generator Machine / 一个喷墨机

