Ceramic 3D Printing Workshop

JETCLAY

Introduction

JetClay is an open source Platform that explores the world of 3d printing and ceramics, relating the digital and the analog, tradition and technology, makers and ceramists.

Since 2017 we develop our own tools to make unique pieces of ceramics at the crossroads among industrial design, architecture, interior design and sculpture.

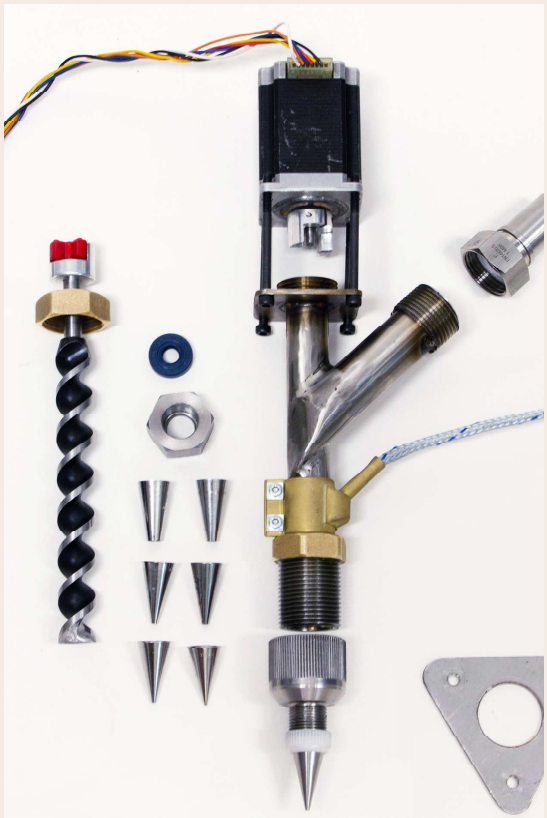
"It's not just about making things, it's about making community, making a difference, and making a more just, open, and collaborative world" (Grace-Flood, 2018)

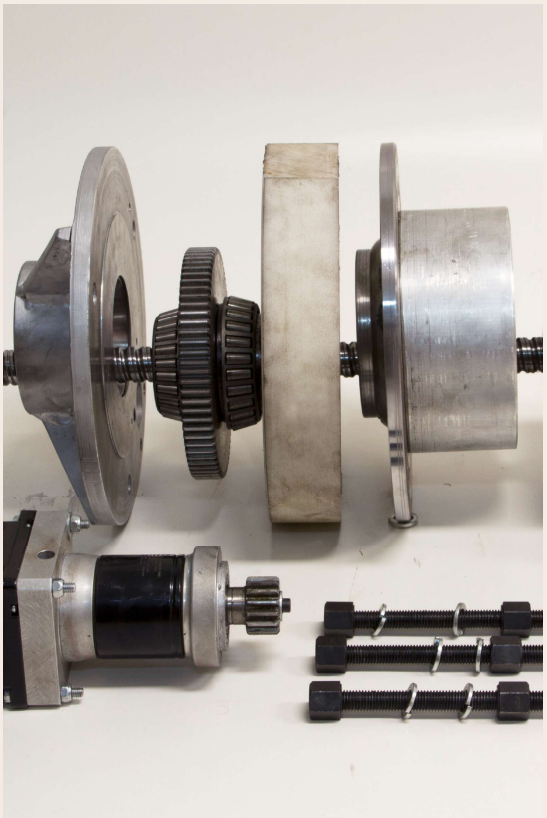
Open Source Technology

From our beginnings back in 2017 we were sure about 3D printing large ceramic pieces. At that time you couldn't find in the market a system able to print ceramics larger than 40cms high, therefore our approach to technical developments has been purely necessity driven.

As active members of the maker community, we have learnt from the shared knowledge this community offers to develop our own tools both 3D printers and extrusion systems. Developments that we give back to humanity 's technological heritage, because we believe in Open Source and we are convinced of the more you give the more you receive.

You can find our developments and contribute in Wikifactory where the community of product designers, engineers and enterprises come together to design, prototype and manufacture hardware products.





Proposal

In JetClay we share our technological development with the maker community, publishing them in repositories like WikiFactory and also making workshops focusing on the building and use of these tools.

These workshops are addressed to 3d printing users that want to add clay to their material palette but also to ceramists, artists and designers that want to start out in additive manufacturing with clay.

Goals

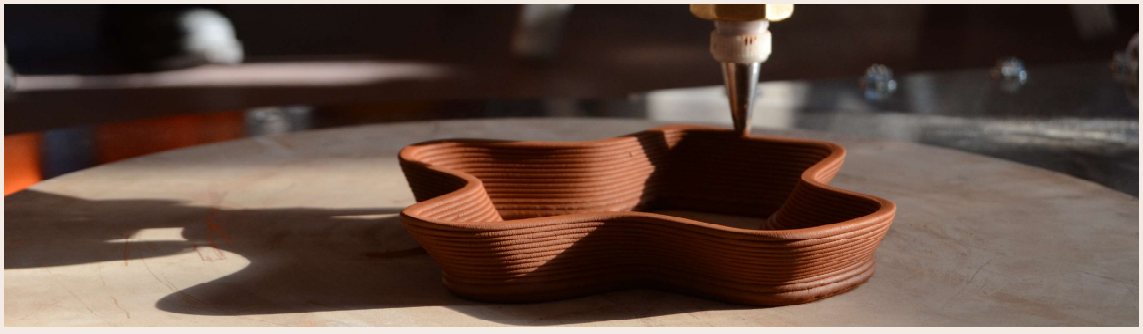
The workshop serves as an introduction to ceramic 3D printing starting from the construction of a delta printing with a printing volume of 1meter high x 70cm wide. Attendees will experiment all phases of the building process, the use and design of the pieces, learning all the necessary for building their own machine and making the most of this tool. At the end of the workshop they will be capable of operating it fully independently and will develop their own project.

During the first week, theoretical and practical foundations of ceramics and 3D printing will be reviewed, along with the possibilities they offer; the assembly of the structure and mechanical components, the electronics elaboration, and software programing will take place; the material and printer will be prepared for its functioning, and the first print will be made.

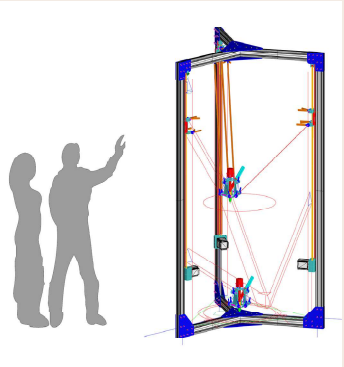
In the second week, we will study the workflow and the opportunities this technique offers for each field; the participants will develop their own projects, designing and preparing the printing files; will make Small-scale prototypes and print large format pieces; and the workshop will be finished with the presentation of the final products.

The participants which attend the bootcamp will receive personalized mentoring from an interdisciplinary team in order to develop meaningful projects with this emerging technology.

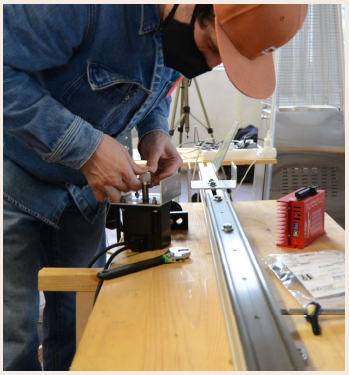
The printer is specifically designed for ceramic paste extrusion with LDM (Liquid Deposit Modelling) and can be built for less than 3.000 euros (commercial equipments cost tens of thousands). The ceramic pastes we work with do not require any type of extra additives. All standard ceramic materials we can buy in a ceramic store can work in the Jetclay machine.



Assembly of a delta XL

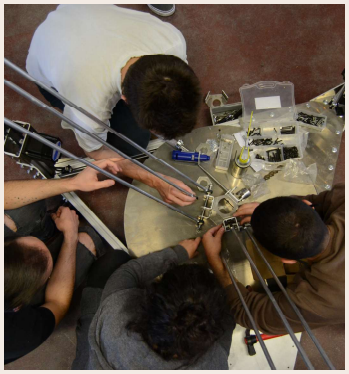


Basics of 3D Printing

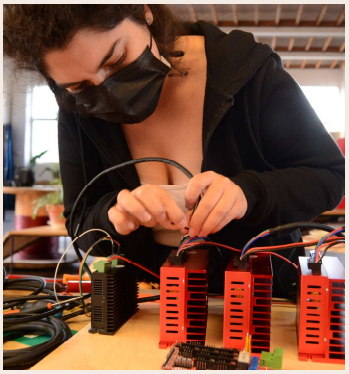


Assembly: building the towers

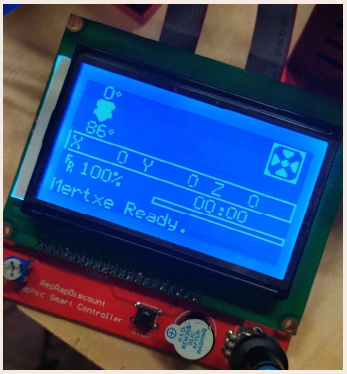
Assembly: joining the structure



Assembly: bars and effector



Preparation of electro-nics and soldering



Configuring the printer software

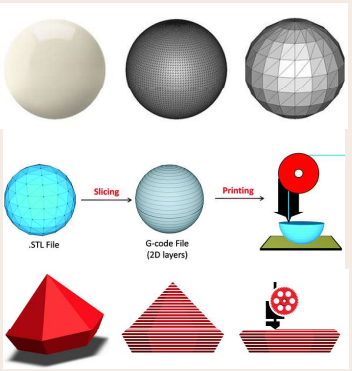
Material preparation and tank loading

Operating a XL c lay 3D printer

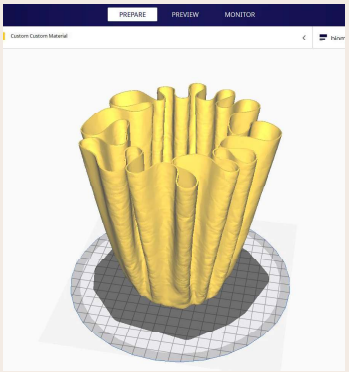
Ceramic 3D printing

Project development

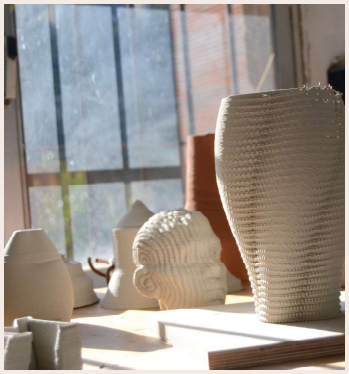
What can I do with a 3D printer?



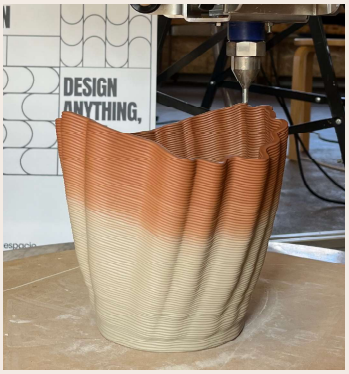
Workflow



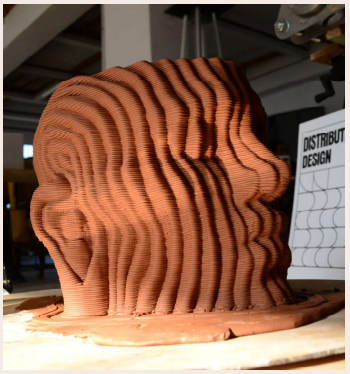
3D modeling and file preparation



Scaled prototypes printing



Printing large-format parts



Printing large-format parts

Printing large-format parts

Final works presentation

Workshop closure and baking of the pieces

Materials

The following materials will be needed to build the 3D printer.

STRUCTURAL COMPONENTS

·Aluminum slot profiles
·Round extruded profiles

MECHANICAL COMPONENTS

·Linear motion technology
·Timing belts, pulleys and gear wheels

MECHANIZED COMPONENTS

·Aluminum laser cutting & bending
·Turning lathe machining
·3D printing

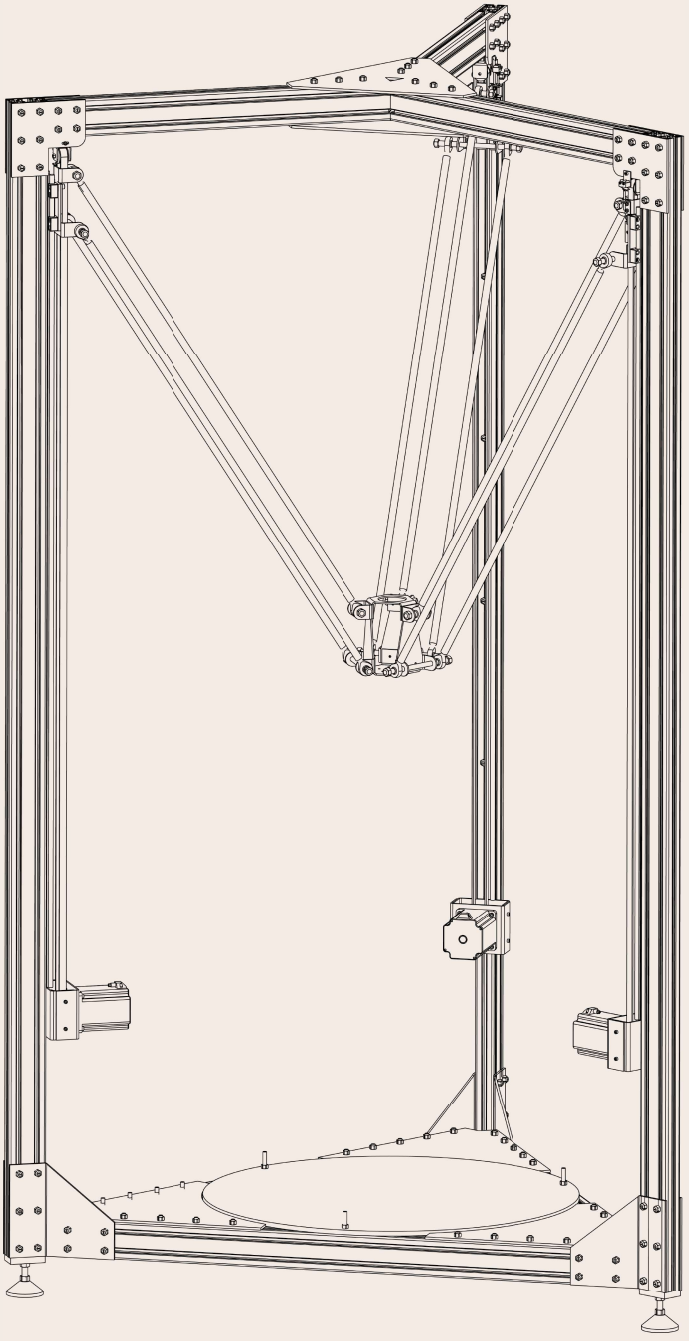
MOTORS AND DRIVERS

ELECTRONICS

·32 bit Duet 3D board
·Touch screen
·Power supply

FEEDING AND FORCE SYSTEM

EXTRUDER



For a more detailed version visit our WikiFactory page:
https://wikifactory.com/+jetclay/xl-delta-printer/files/

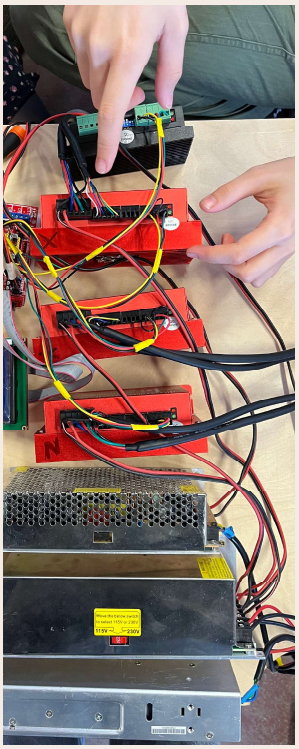
Program

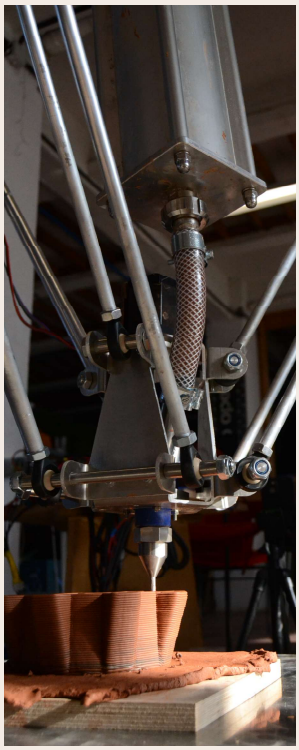
A 2-week immersive workshop to learn and build community

1 Introduction
Presentation of JetClay, fabla-b/school/space and participants

2 Theoretical development and start of the build
Description, BOM, vocabulary, suppliers. Start the towers assembly

3, 4, 5 Assembly of the structure





6 Wiring and electronics

7 Electronics and programming

8 Workflow and first print

9, 10, 11, 12, 13, 14 Development of projects
3D design and modeling, prototyping and large-scale printing

15 Presentation of the attendees's work and closure of the workshop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