Computational Fabrication

CS 491 and 591, Special Topics in Computer Science
Professor: Leah Buechley
https://handandmachine.org/classes/computational_fabrication

About me

Leah Buechley
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https://handandmachine.org

Introductions

What this class is about

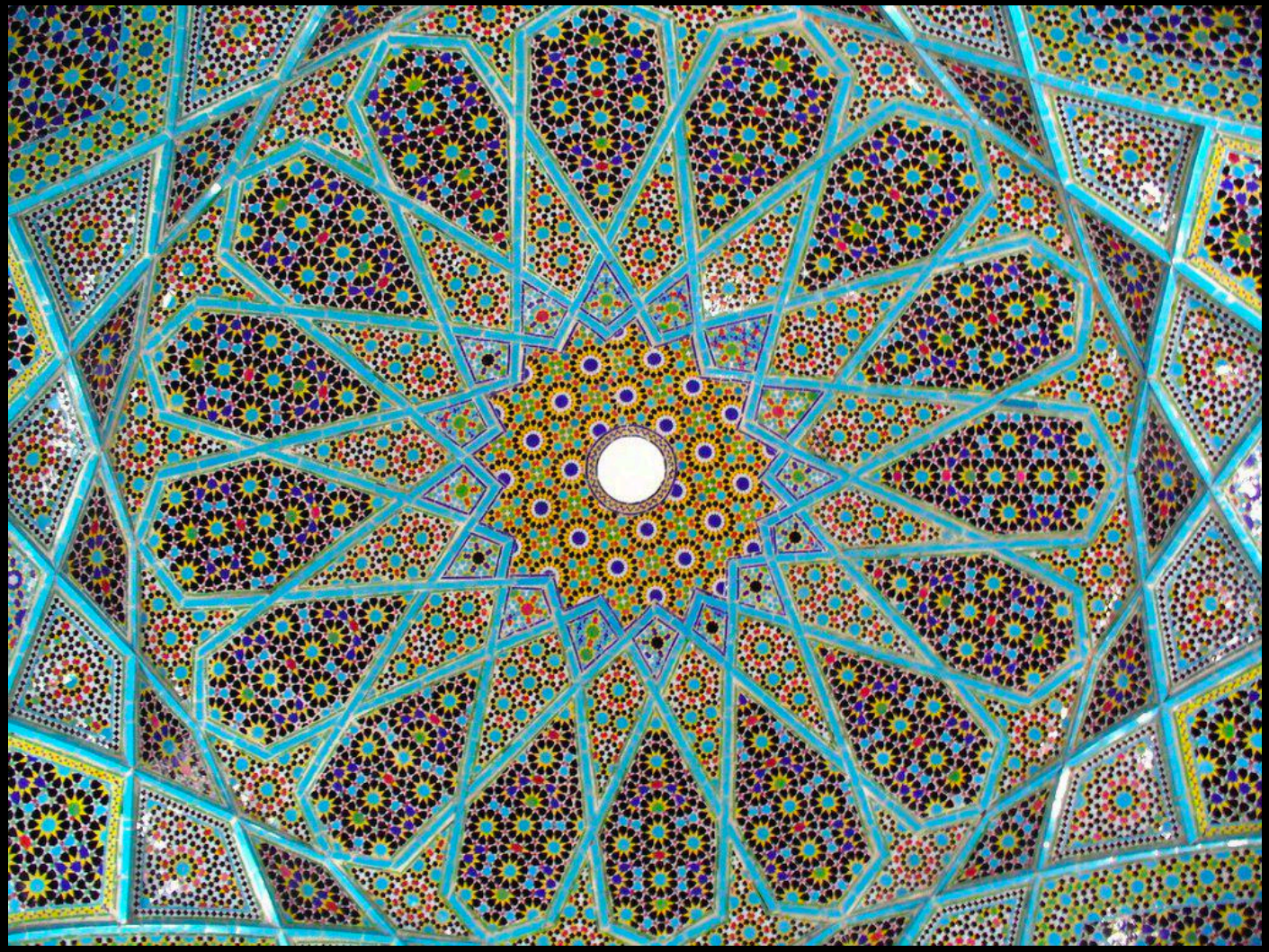
computation as a design tool

the use of a set of abstract rules to produce a design

computational design
algorithmic design
parametric design
generative design

For more discussion see:
Inês Caetano, Luís Santos, and António Leitão. 2020. Computational design in architecture: Defining parametric, generative, and algorithmic design. Frontiers of Architectural Research 9, 2: 287–300. https://doi.org/10.1016/j.foar.2019.12.008

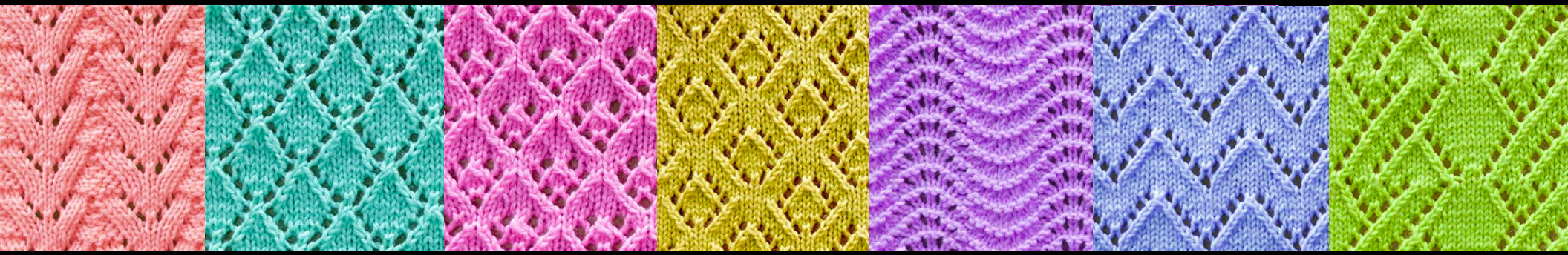
predates &
does not depend on
a computer

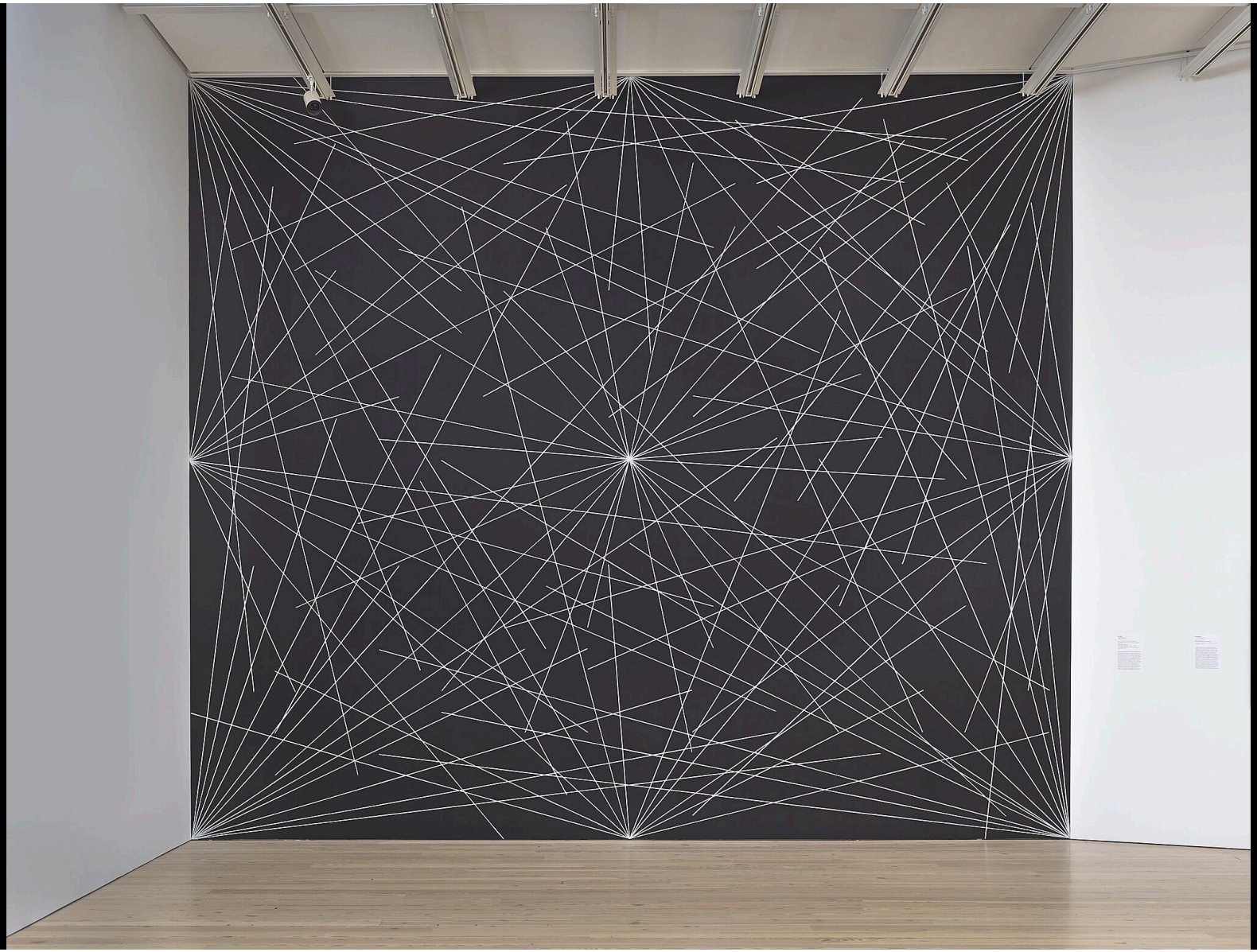


Tomb of Hafez

Pots by Dorothy Torivio
Acoma Pueblo

Kente weaving
https://en.wikipedia.org/wiki/Kente_cloth





Sol Lewitt

computational fabrication

the use of a set of abstract rules to produce a design, that is then produced via digital fabrication

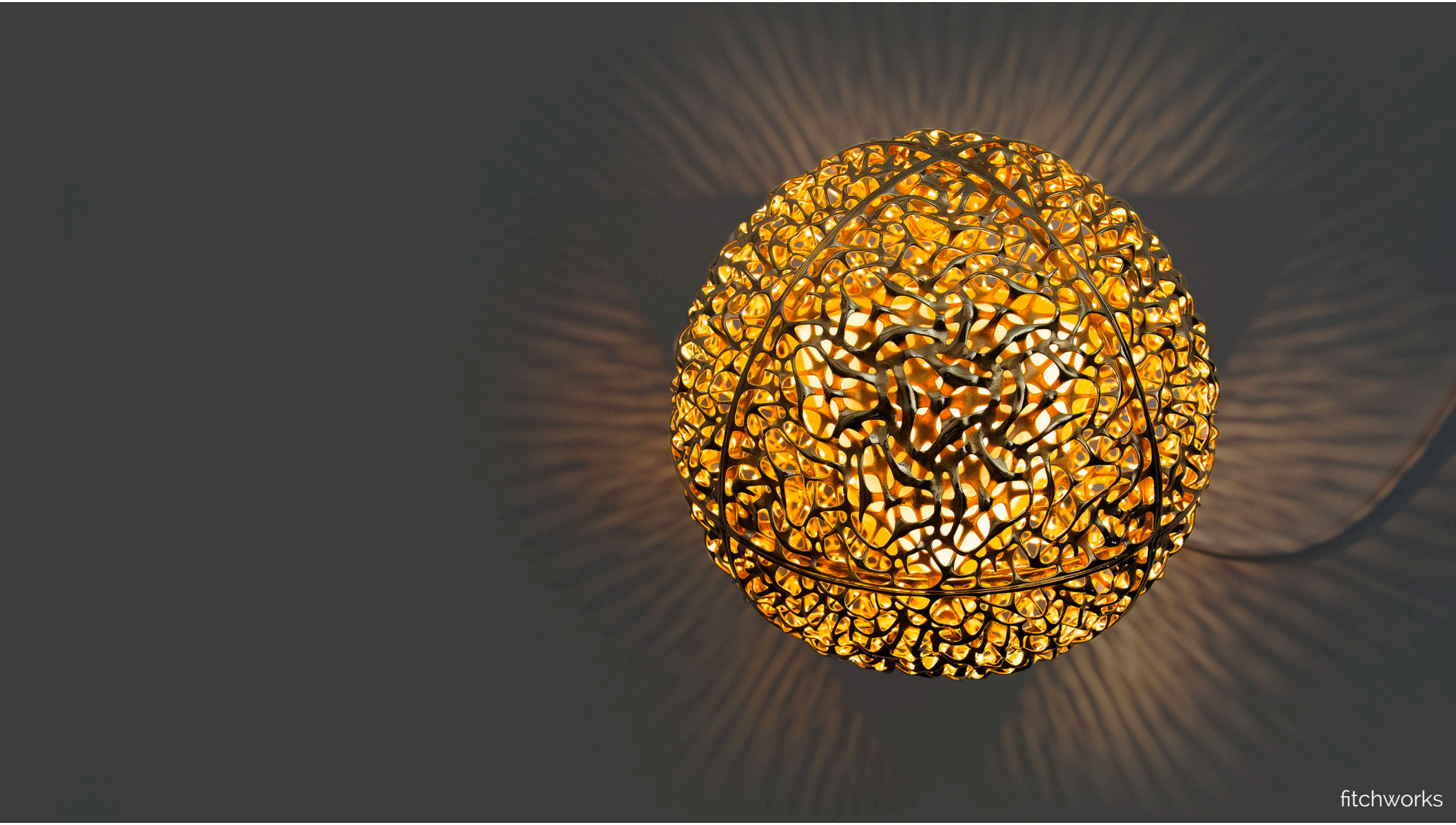
computational design & fabrication today

Heydar Aliyev Center in Baku, Azerbaijan, Zaha Hadid

Aqua Tower in Chicago, USA, Jeanne Gang

Nervous System

Bryan Czibesz


fitchworks

Ronald Rael

an emerging research area

Welcome to the 9th annual

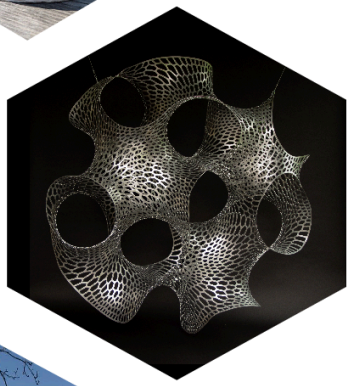
ACM Symposium on Computational Fabrication

Exploring the use of computational
tools for the creation of physical things

Live Streaming

Proceedings

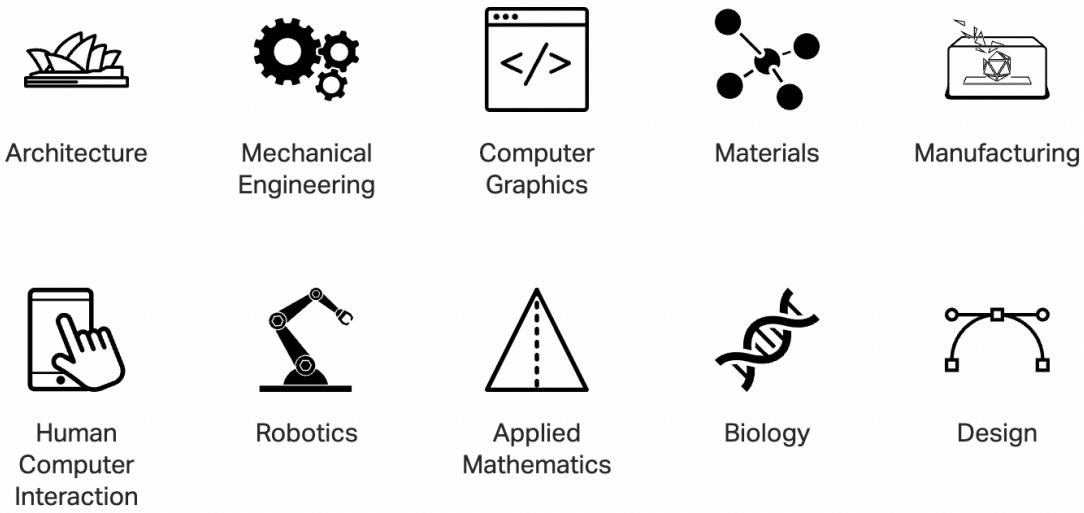
July 7-9, 2024
Aarhus, Denmark



About

The 8th annual ACM Symposium on Computational Fabrication will gather experts and enthusiasts from many areas of academia and industry, in order to explore the use of computational tools for the creation of physical things. SCF provides a venue for participants to discuss cutting-edge results, cross-pollinate ideas, and strengthen interdisciplinary connections and collaborations.

Attendees and presenters come from a variety of backgrounds, including:



class as research
an exploration for all of us

Class Nuts & Bolts

Website: main class venue

https://handandmachine.org/classes/computational_fabrication

Syllabus & Course Information
Assignment Postings
Assignment Submissions
Discussion

Canvas

https://canvas.unm.edu/

Access Grades

Software

Rhino & Grasshopper
https://www.rhino3d.com/

PyCharm or any Python IDE
https://www.jetbrains.com/pycharm/

Cura
https://ultimaker.com/software/ultimaker-cura

all free or provided

Hardware

3D Printer
Creality Ender 3 Pro, $250
https://creality3d.shop/
Other 3D printers are fine

order now!
3D printing starts on September 3rd
2 weeks from today

Lab and loaner 3D printers

Limited availability, first come first serve
Require maintenance

Prerequisites

Programming experience
Math fluency (geometry)

Assignments & Grading

Assignments: 65%
Class participation: 10%
Final project: 25%

Project Assignments

Build things
Document your process
Post on website

Project assignments graded on

Design
Craftsmanship, Artifact
Craftsmanship, Code
Documentation

Large & Small Assignments

Small Assignments 25 points
Large Assignments 100 points

Late Assignments

Three free late days for the entire semester

After that: 10 points off for each late day

Collaboration

Talk to and work with classmates

Use the internet & example code to learn new techniques

Cite the sources you use and find helpful

“Cheating” = pretending someone else’s work is your own
This is a dishonorable and silly thing to do

Schedule Overview

Website

For Next Class

Sign up for an account on our class website

Download & install Rhino8
You will be emailed a link that will let you access a license.

If you're not yet registered but want to be

Due to the nature of this class, the size is capped at 30

Add yourself to the waitlist. Space may open up.

questions?

Welcome!

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Install Rhino8