Class Background
6.S080

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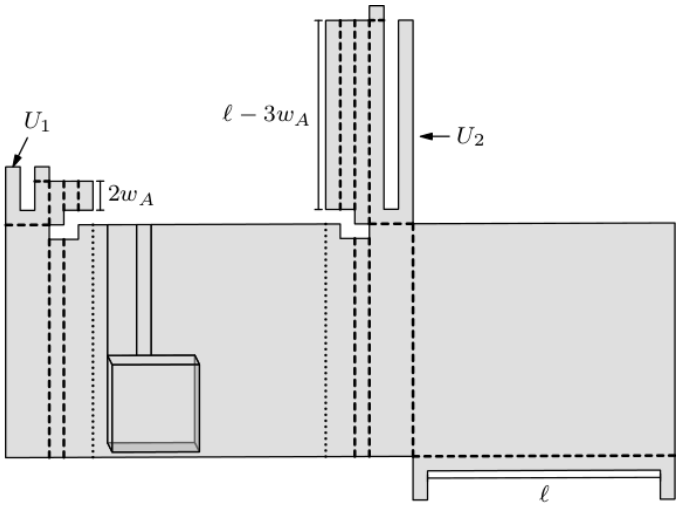
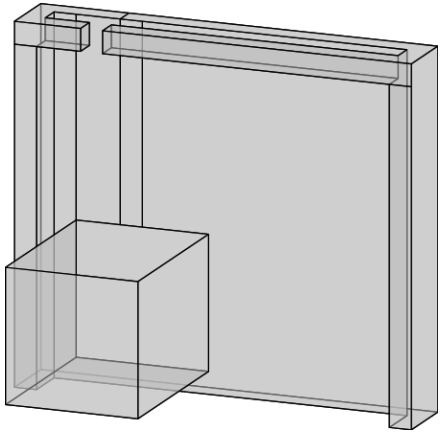
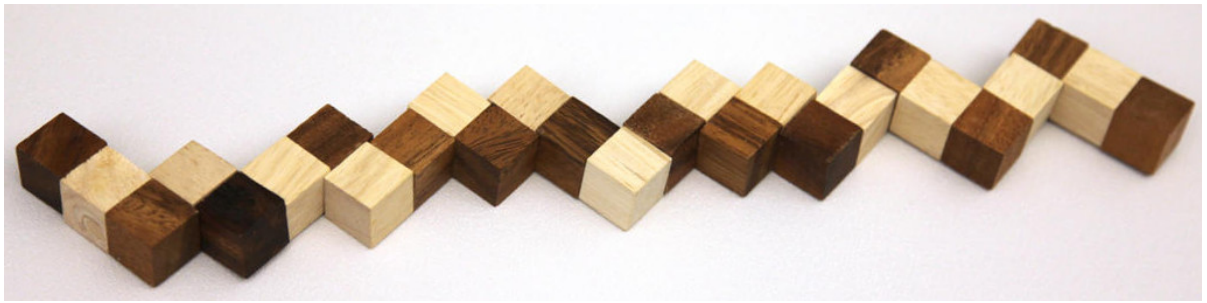
Zachary Abel

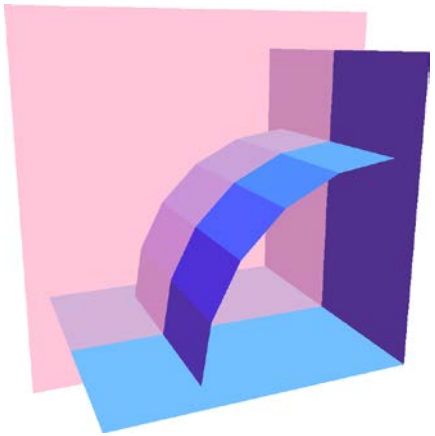
zacharyabel.com

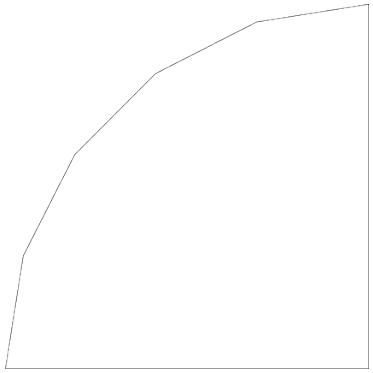
MIT Math Department
Ph.D. Candidate
Computational Geometry
Advisor: Erik Demaine

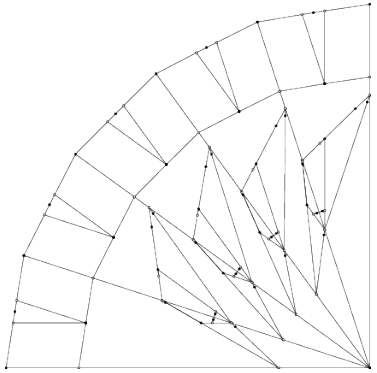


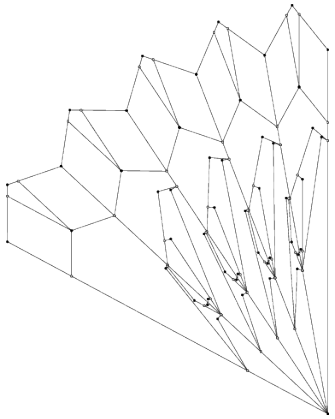


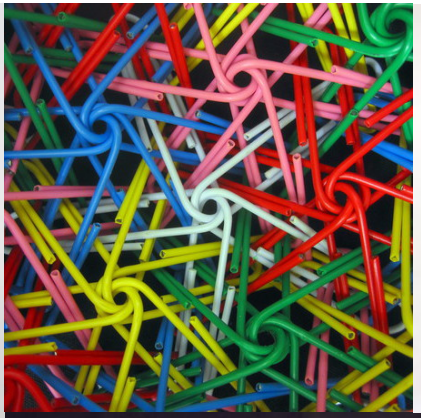


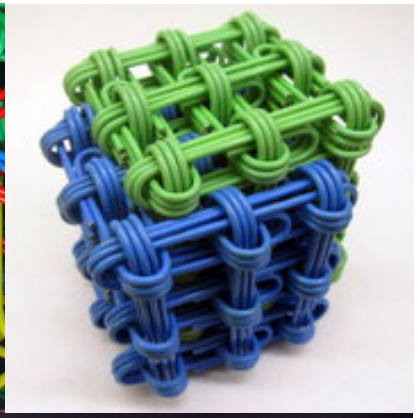


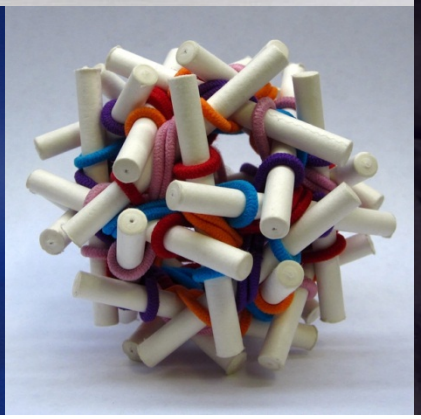












Matthew Arbesfeld
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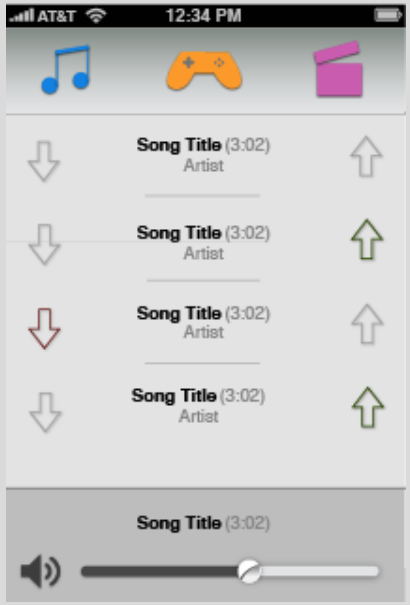
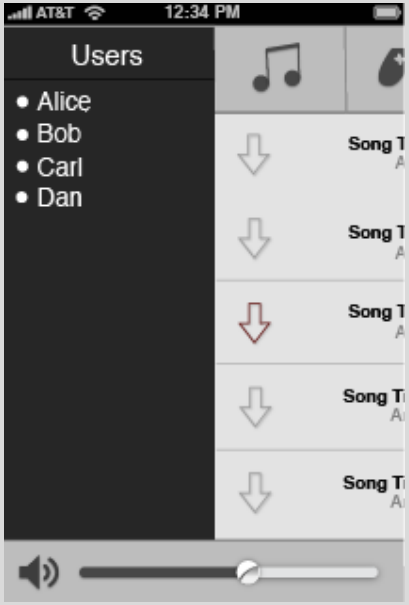
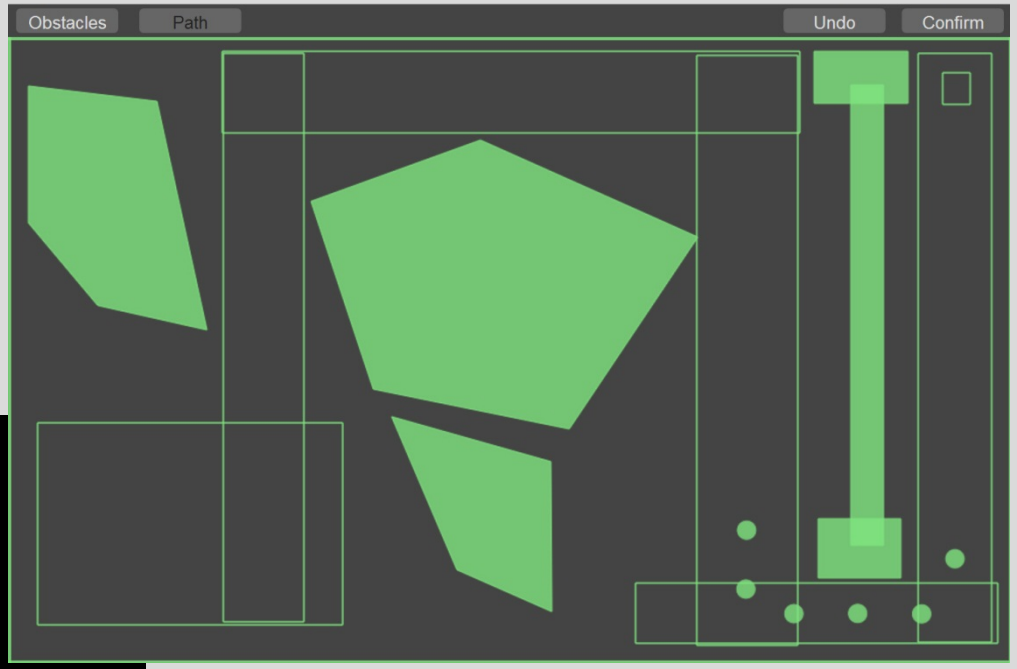
Matthew Arbesfeld

Course 6 Freshman

iOS ↓

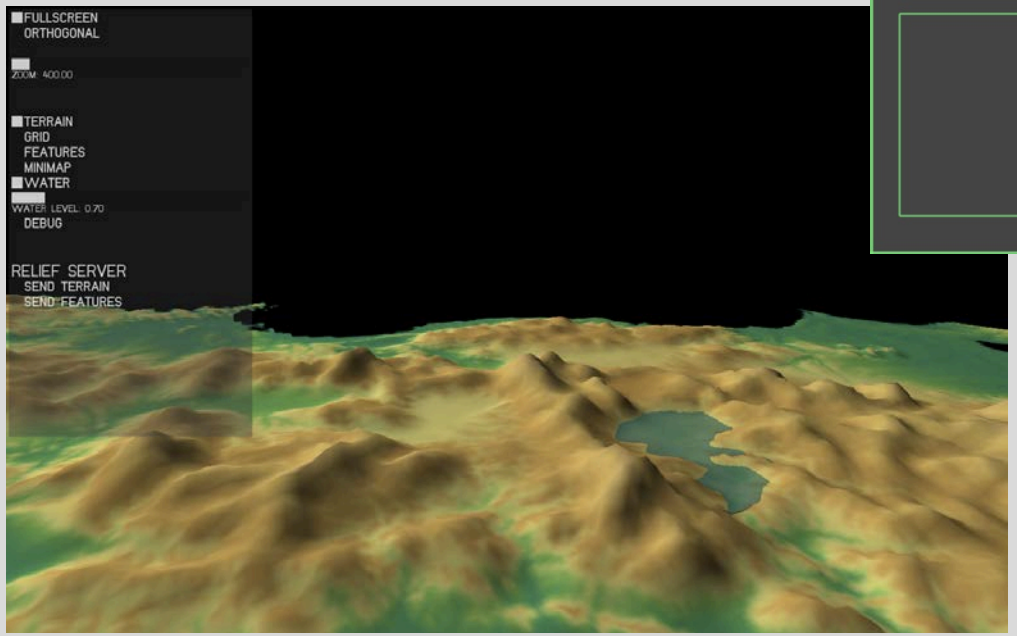






↑

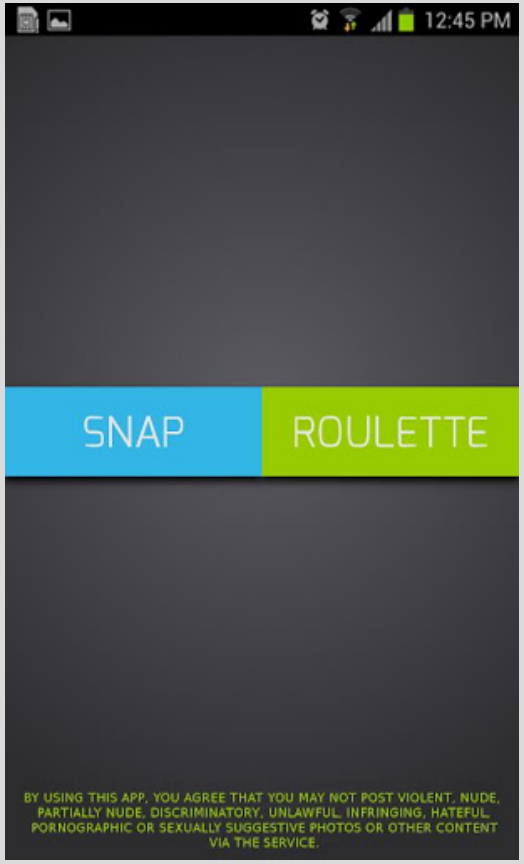
JavaScript / Python



⟵ OpenGL / iOS

Interests

- Algorithms (C++, Java, Python)
- Computer Graphics
  - OpenGL 4.0 / GLSL
  - Skia (Google Chrome)
  - 3ds Max
- Mobile
  - iOS
  - Some Android
  - Ruby/Rails



Sophia Brueckner
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SOPHIA BRUECKNER

I'm a first year masters student in Media Lab.

I started out doing researching thin films in a materials science lab 10 years ago and ended up a conceptual artist.

In between, I did an ScB in Computer Science/Applied Mathematics at Brown, was a software engineer and did user interface design at Google (iGoogle), worked at Google Research, did an MFA at RISD, and rock climbed a lot.

SOPHIA BRUECKNER

I make generative and sound art, paint, and love learning how to make things. I recently started thinking about how I can incorporate my computer programs with sculptures.

Right now, I am interested in making kinetic sound sculptures inspired by speculative instruments/music from science fiction stories.

Sam Calisch
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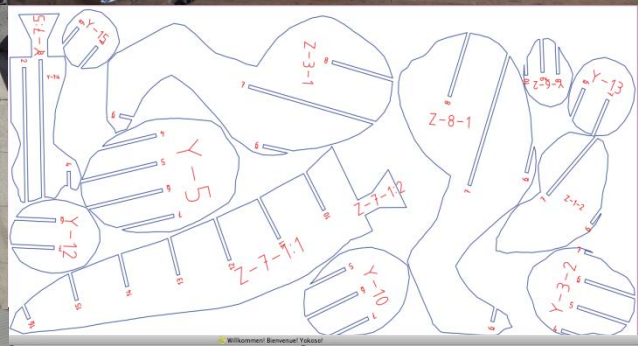
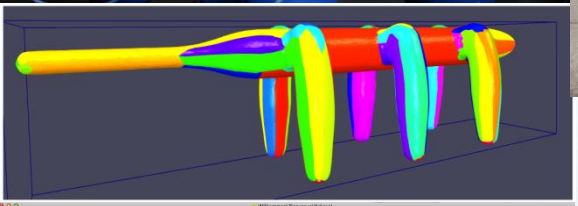
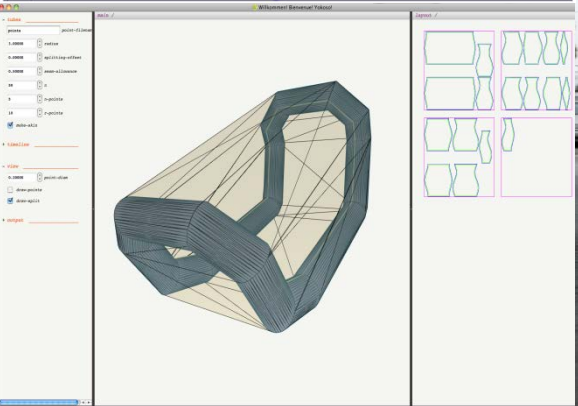
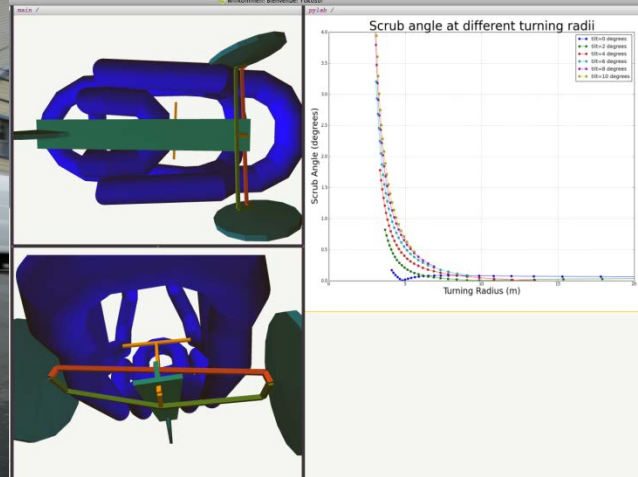
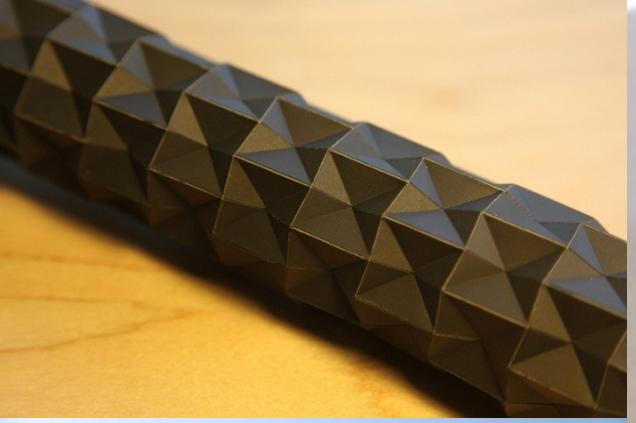
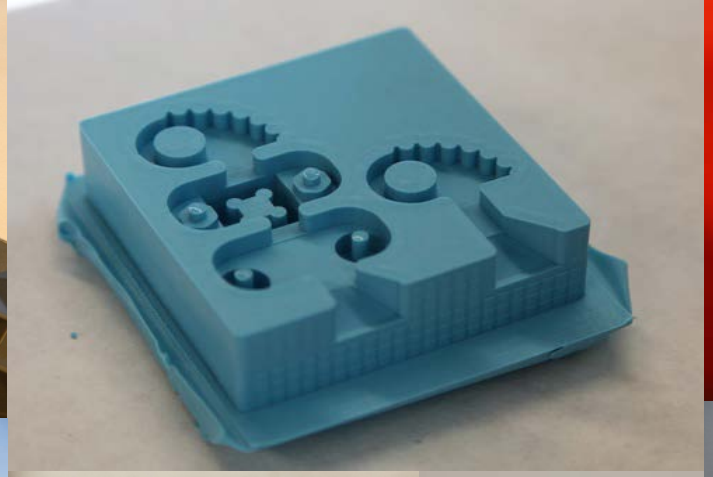
EXIT


Z-7-1
Z-3-1
Z-8-1
Y-5
Z-7-12
Z-7-11
Y-10
Y-3-2

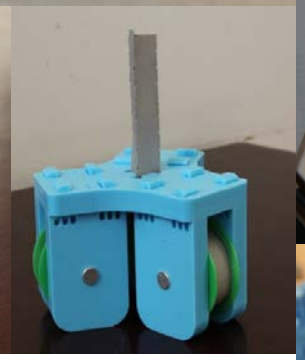
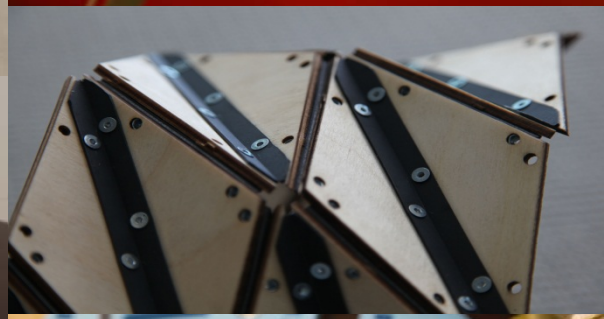
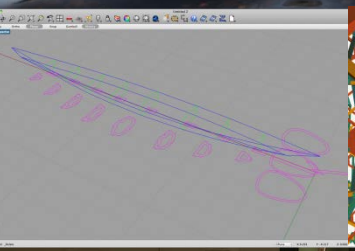
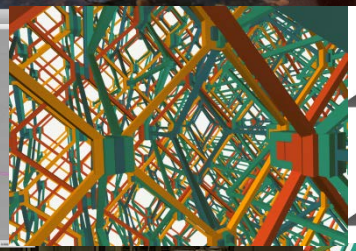
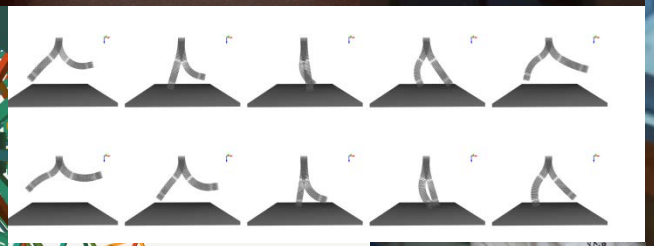
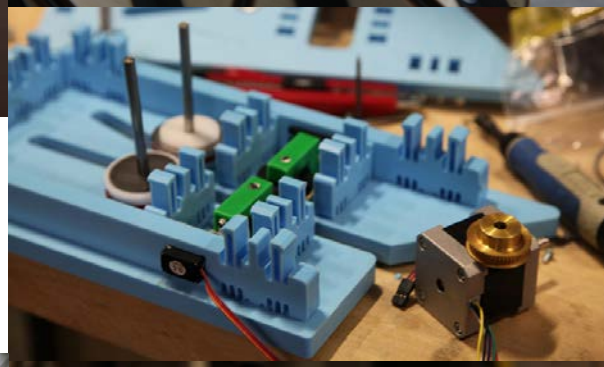


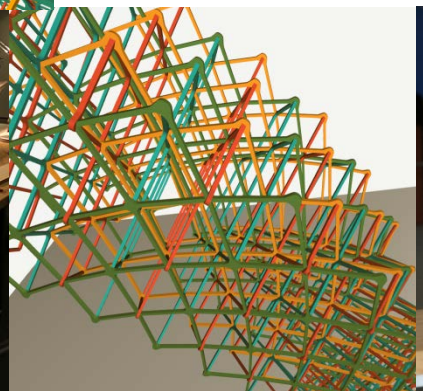



Scrub angle at different turning radii
Scrub Angle (degrees)
Turning Radius (m)





James Coleman
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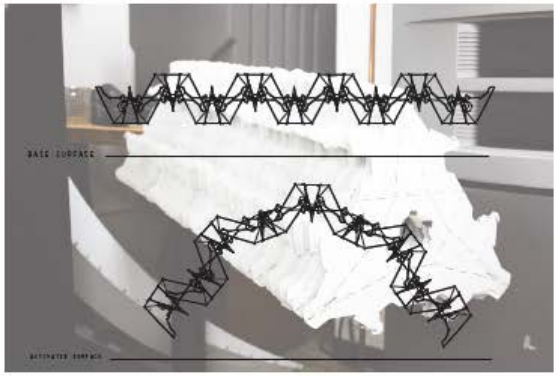
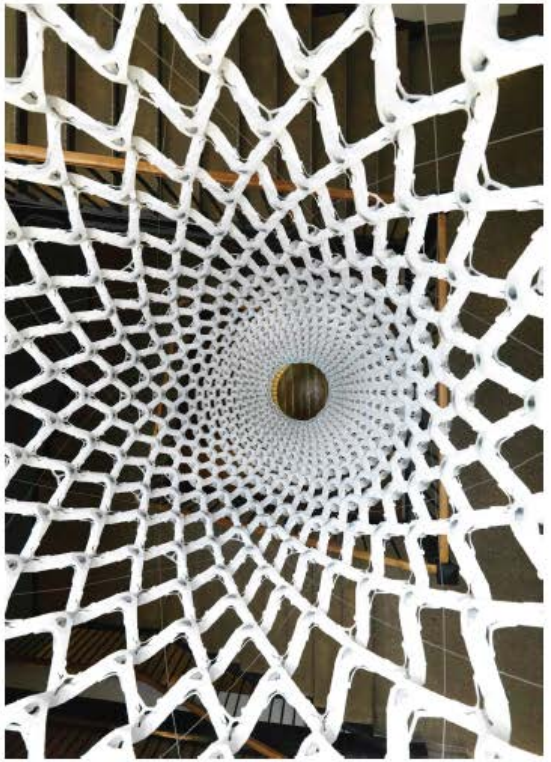
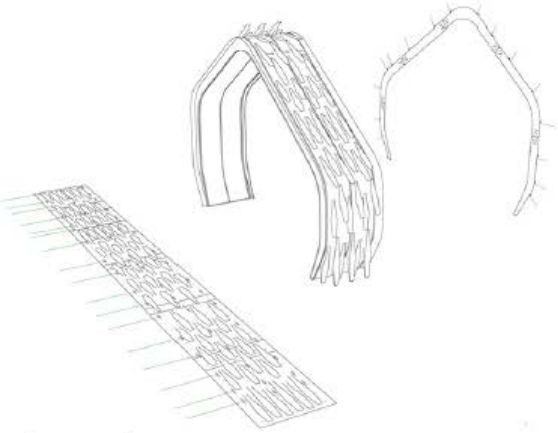
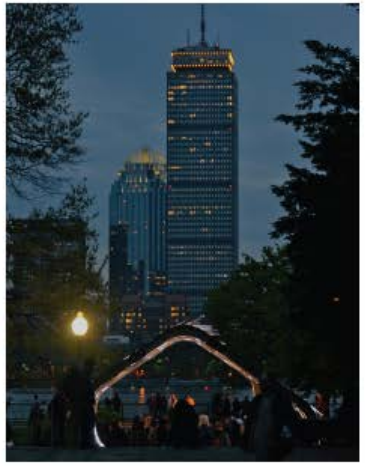


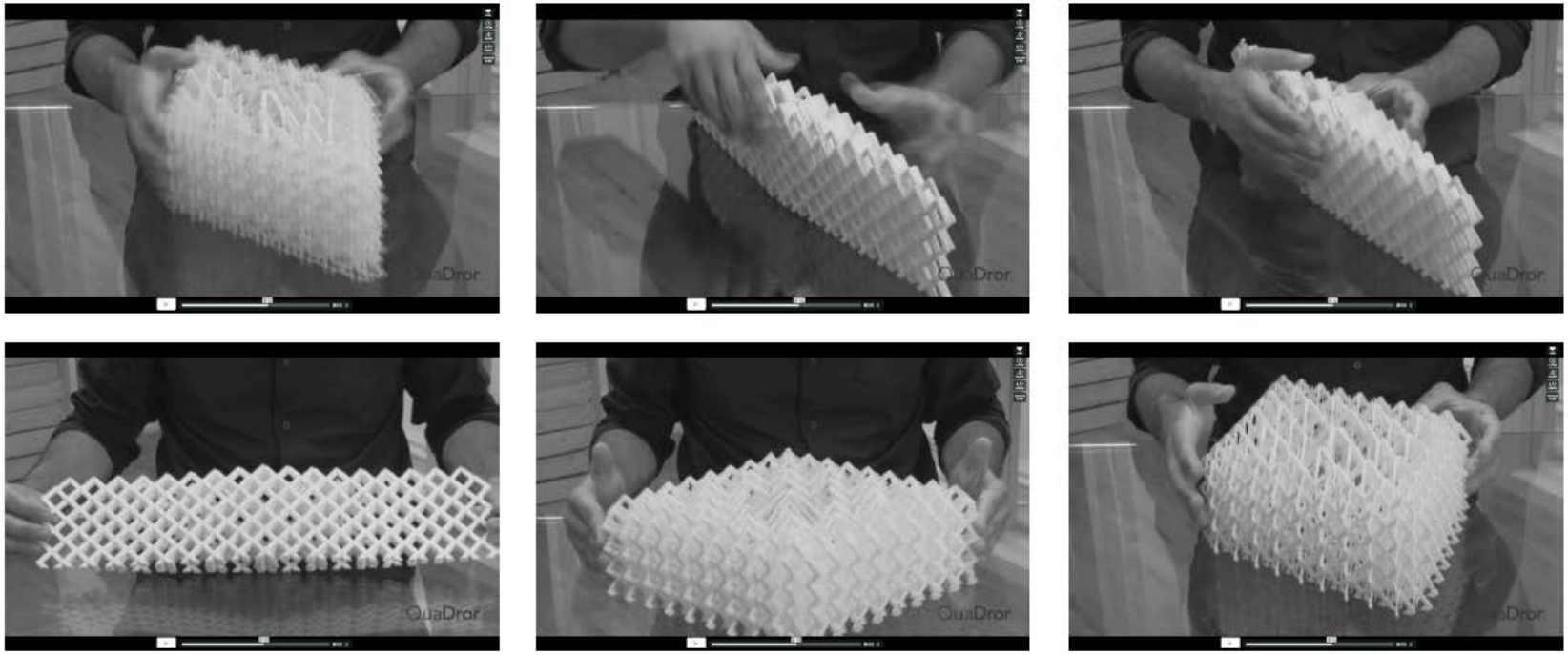
MIT 150 fast festival





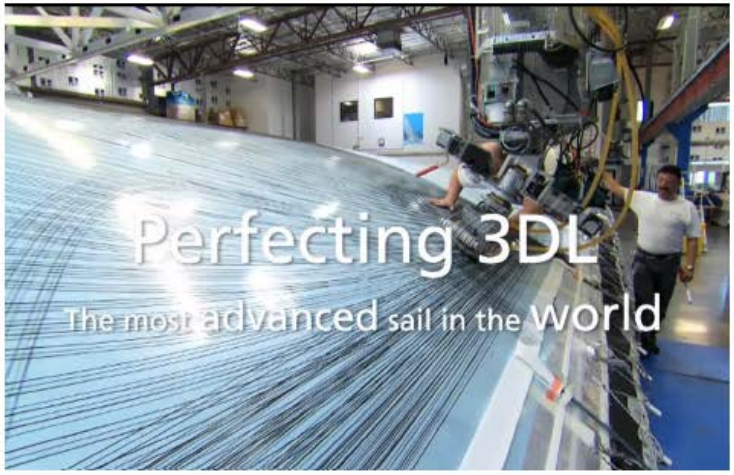
prior work





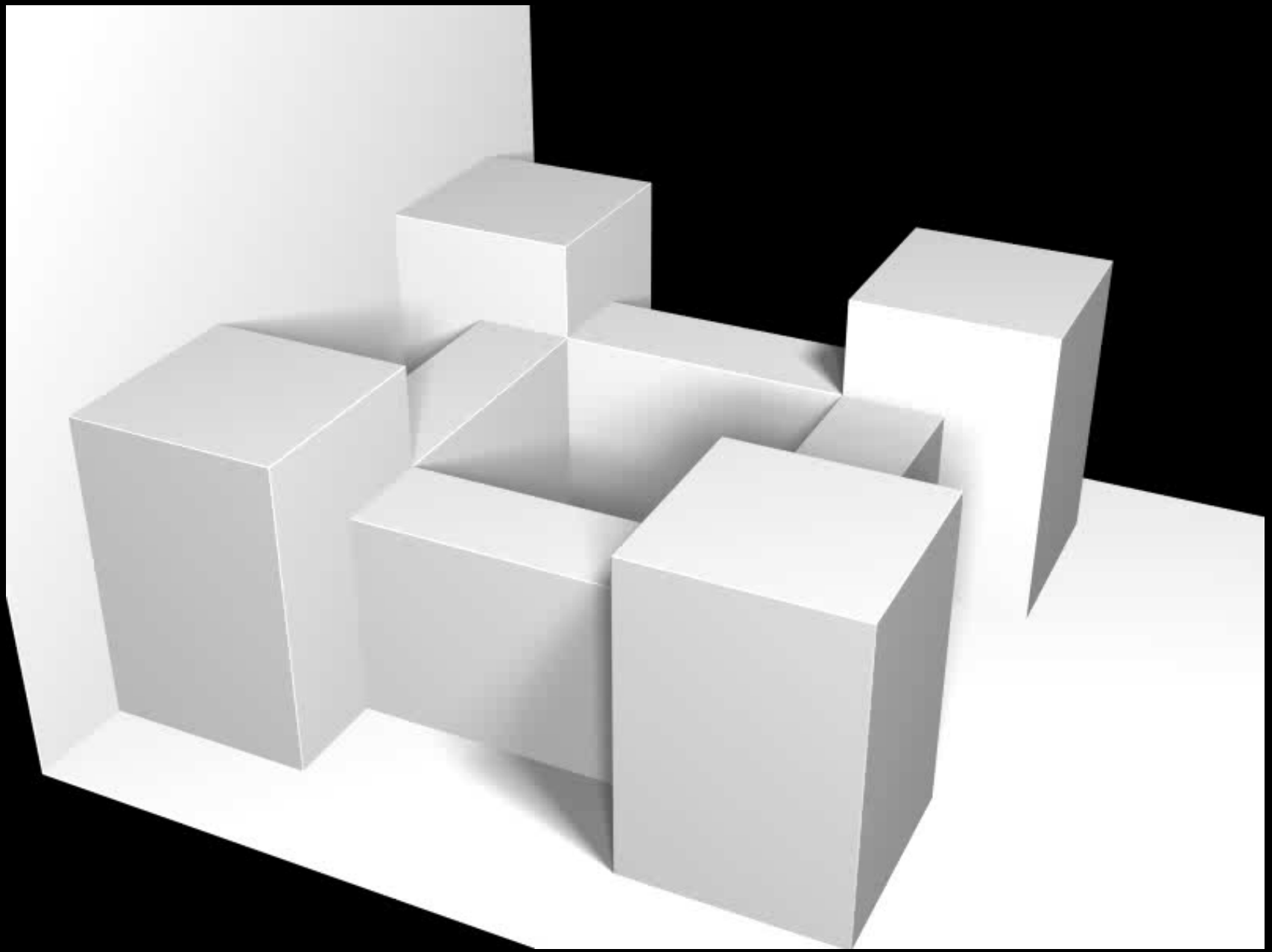
Dror Expanding frame

Felix Candala

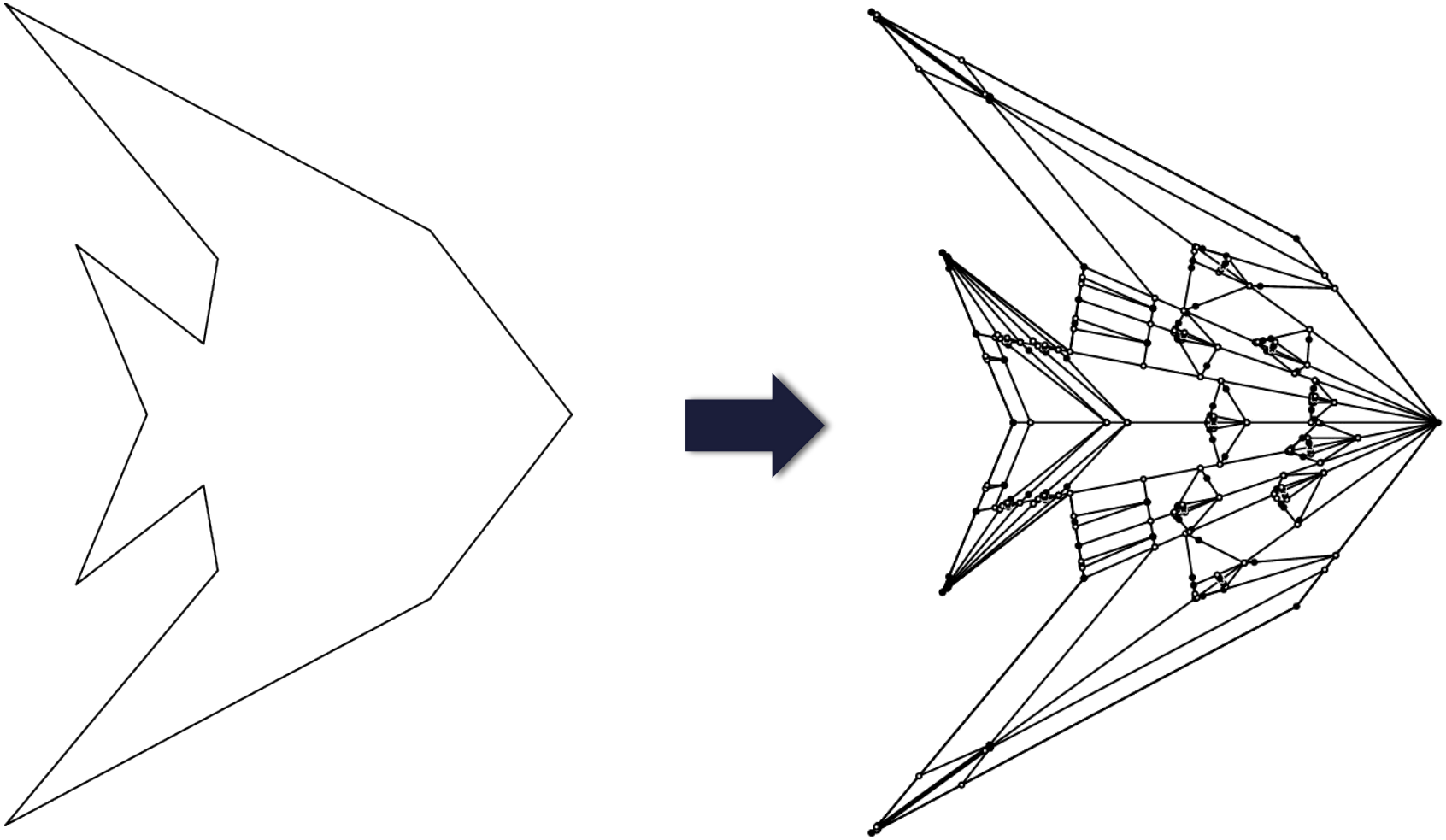


North Sails 3DL

Sarah Eisenstat
seisenst@mit.edu



Algorithm from the paper “Algorithms for designing pop-up cards,” by Zachary Abel, Erik D. Demaine, Martin L. Demaine, Sarah Eisenstat, Anna Lubiw, Andre Schulz, Diane L. Souvaine, Giovanni Viglietta, and Andrew Winslow.



Algorithm from the paper “Algorithms for designing pop-up cards,” by Zachary Abel, Erik D. Demaine, Martin L. Demaine, Sarah Eisenstat, Anna Lubiw, Andre Schulz, Diane L. Souvaine, Giovanni Viglietta, and Andrew Winslow.

Phillip Ewing
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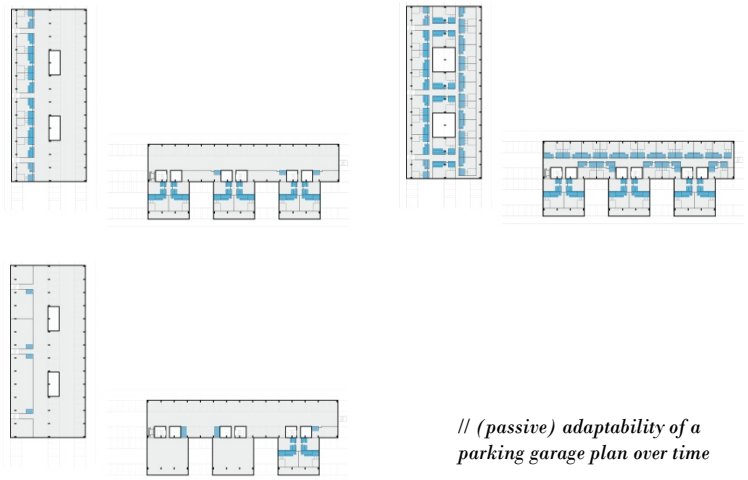


// (passive) adaptability of a parking garage plan over time

// background

Education:

- Bachelor of Architecture, (B.Arch) Auburn Univ. '12
- Bachelor of Interior Architecture, (B.I.Arch) Auburn Univ. '12

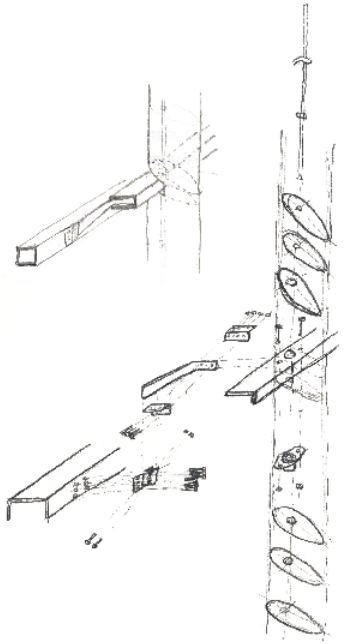
Starting interests:

- Architecture as an articulated "mechanism" for environmental control
- Active vs. passive transformation of space

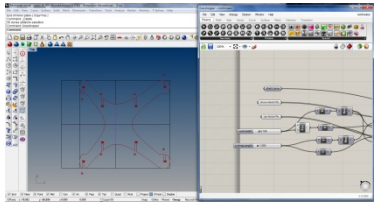
To be explored:

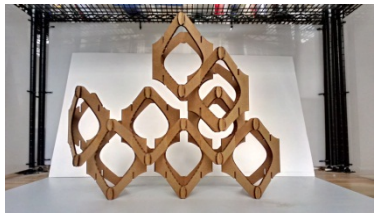
- Active transformation of the architectural envelope to accommodate interior function

// building envelope as environmental mechanism



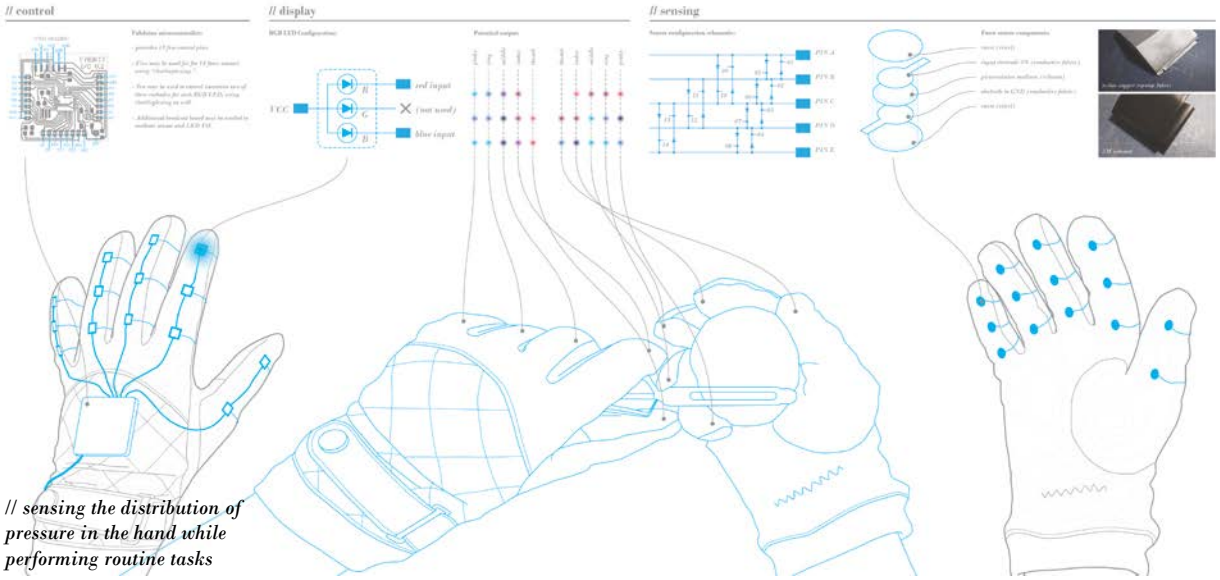
// digital fabrication



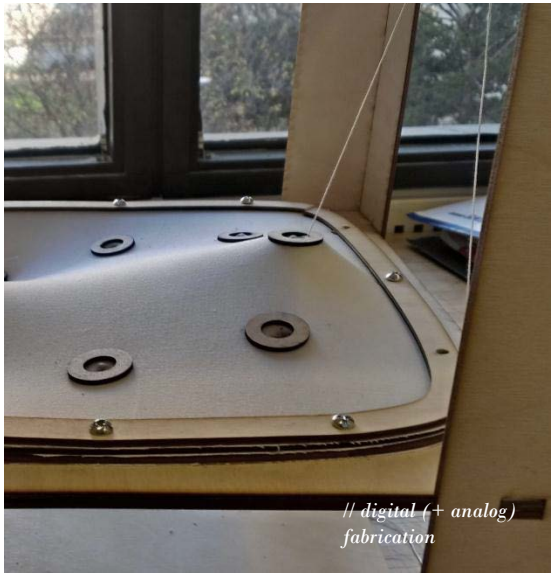


// current interests

- "Soft", material-driven actuation
- Digital (+ analog) fabrication
- Body-centric responsive systems/environments



// sensing the distribution of pressure in the hand while performing routine tasks



// digital (+ analog) fabrication

Jennifer Broutin Farah
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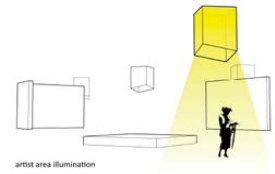
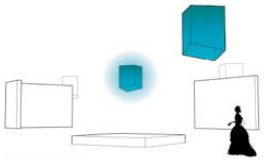
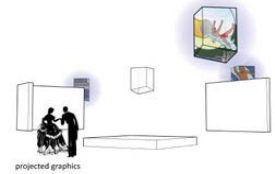
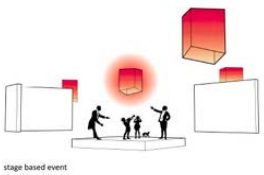
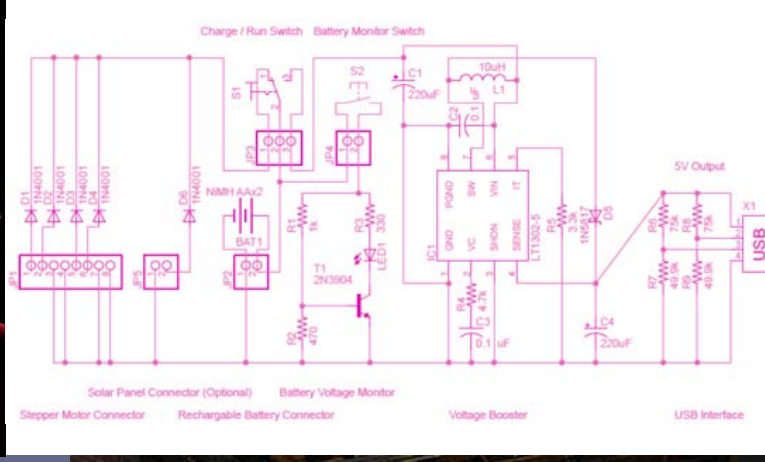
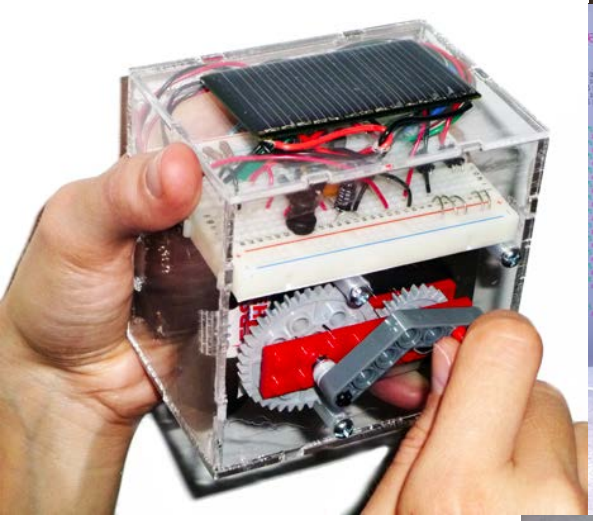

artist area illumination

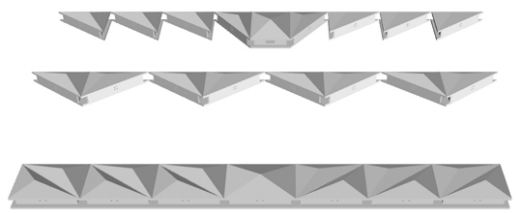

signal to center stage


projected graphics

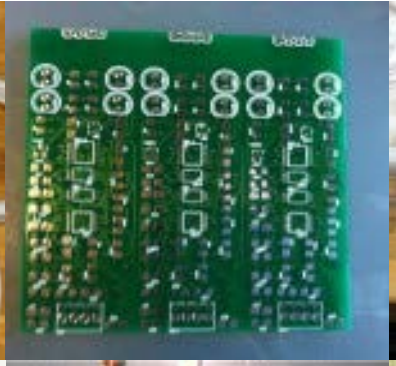

stage based event


Charge / Run Switch
Battery Monitor Switch
10uH
5V Output
NiMH AAx2
Solar Panel Connector (Optional)
Battery Voltage Monitor
Stepper Motor Connector
Rechargable Battery Connector
Voltage Booster
USB Interface



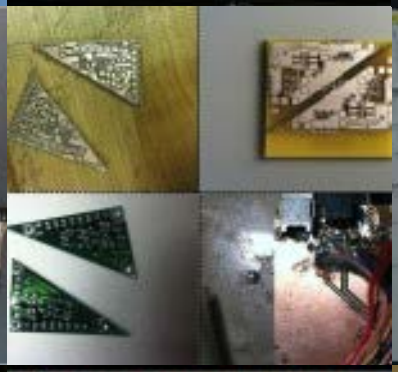
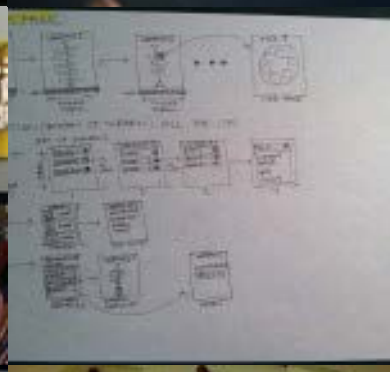
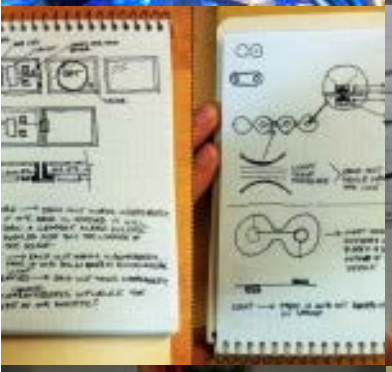
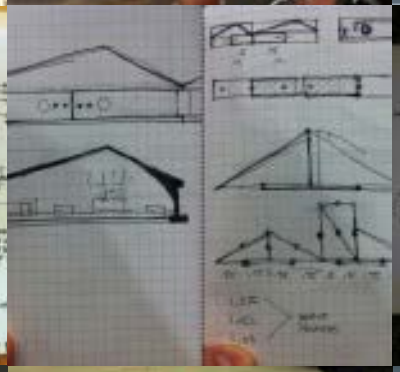
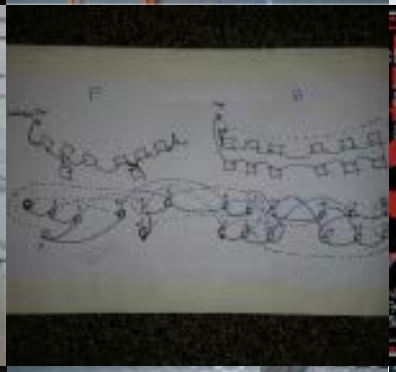
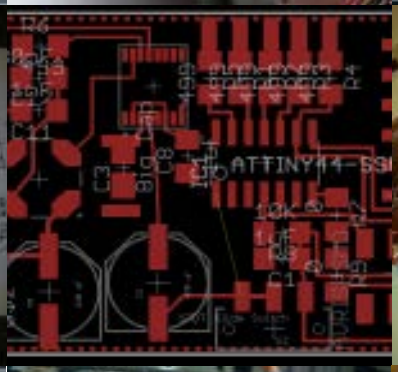
















ATTINY44-SS





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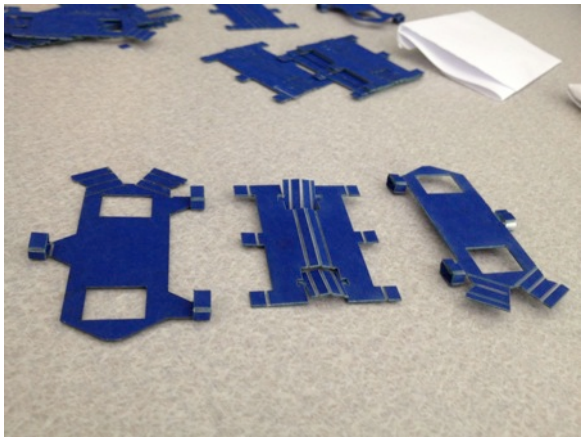
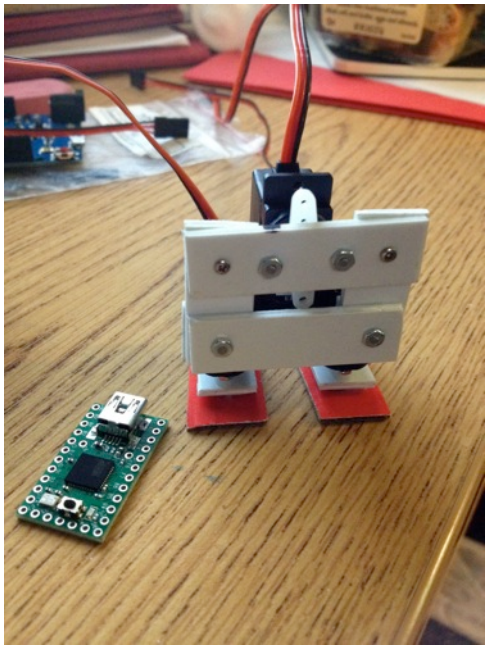
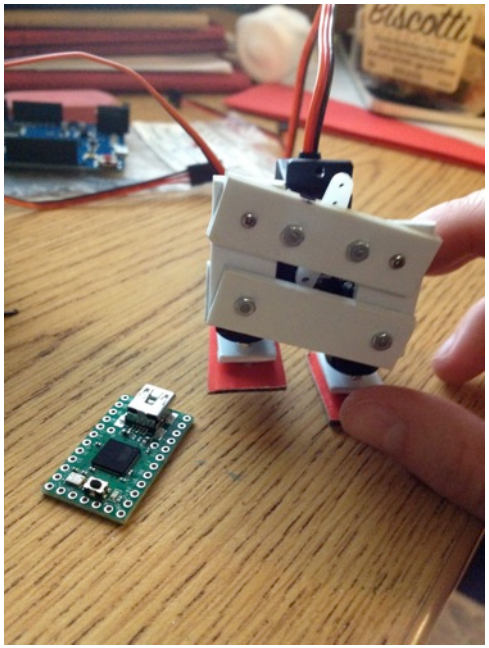
Katy Gero

Mechanical Engineering
Class of 2013

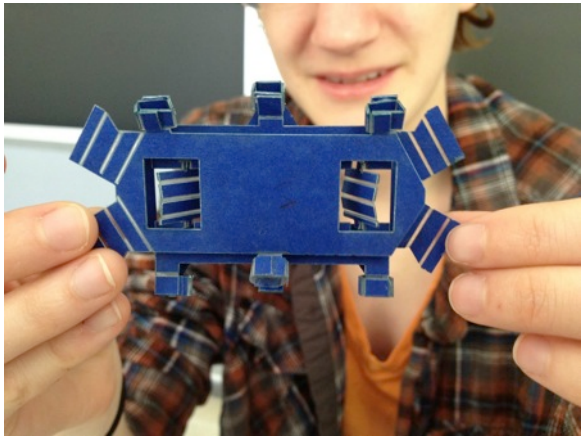


Projects:





∧ Small Walking Robot[1]



Foldable Hexapods[2] >

1. http://www.youtube.com/watch?v=DWSbFfW3lC4
2. http://robotics.eecs.berkeley.edu/~ronf/Prototype/index.html

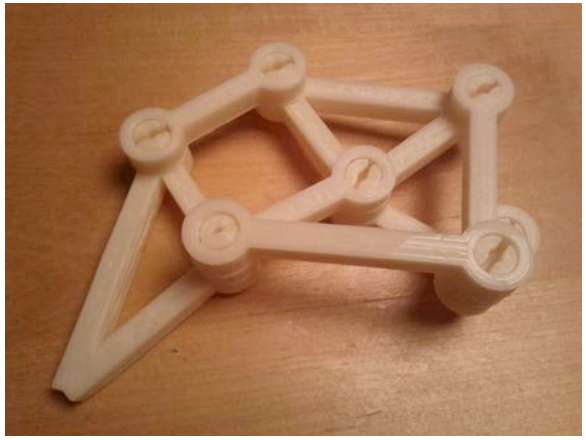
Interests + Inspiration:

^ Hydro-Fold by Christophe Guberan

Theo Jansen's Strandbeest >

^ Hoberman Switch Pitch Throwing Ball

v Taking Things Apart



Mason Glidden
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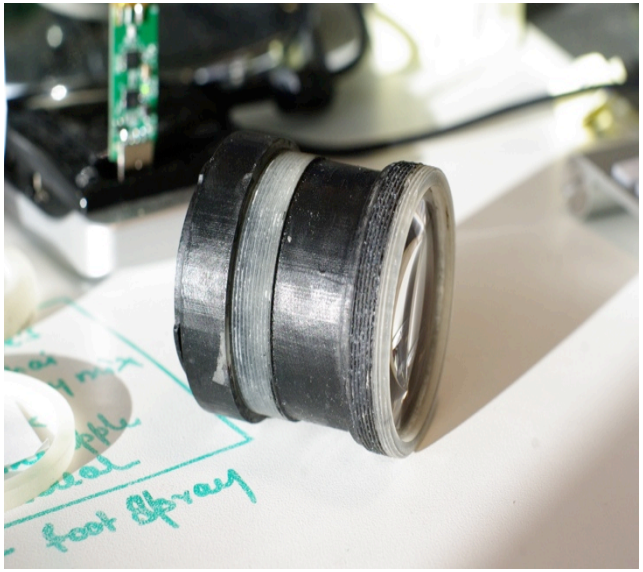
Mason Glidden

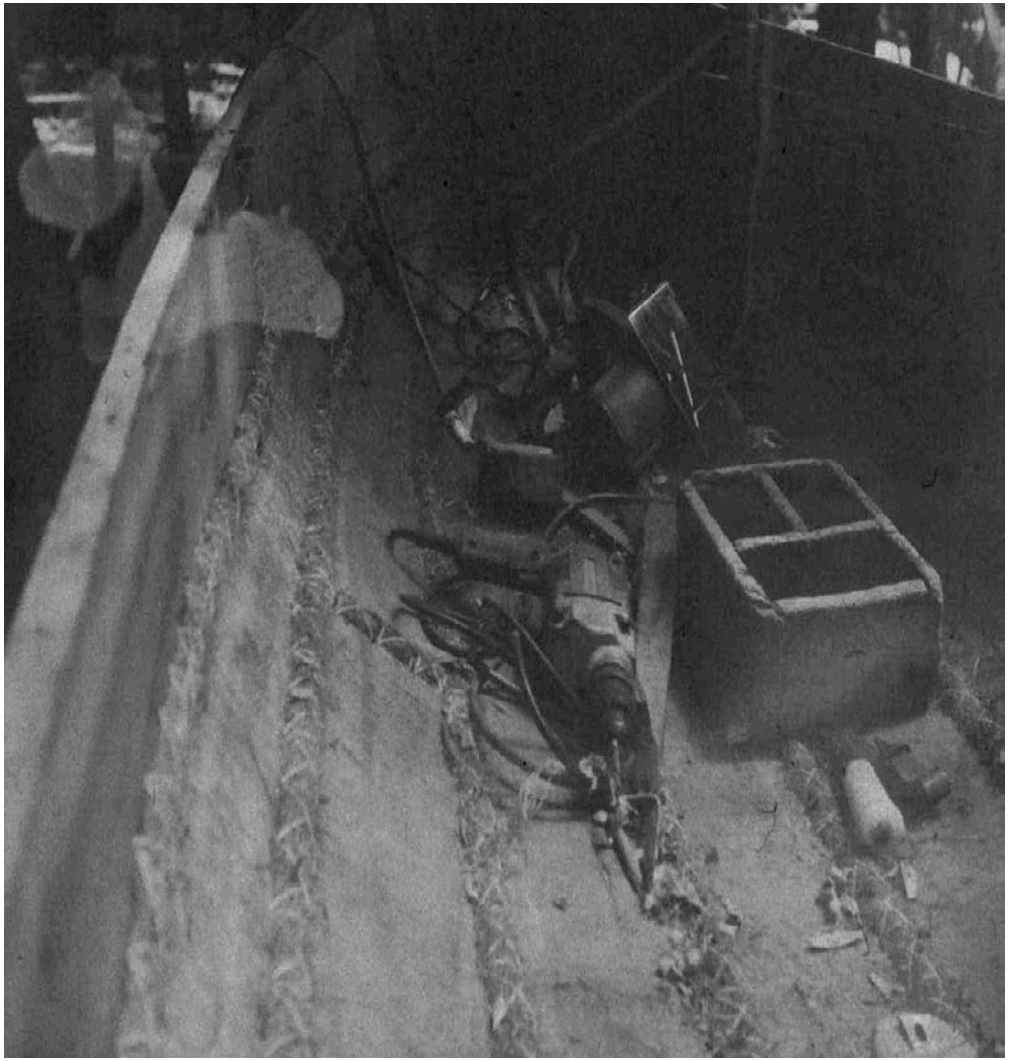
Junior, 6-3


RYOBI

Pragun Goyal
pragun@mit.edu


sohum





Bianca Homberg
bhomberg@mit.edu

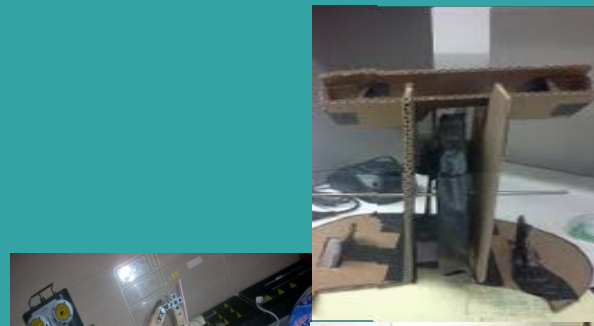
Bianca Homberg

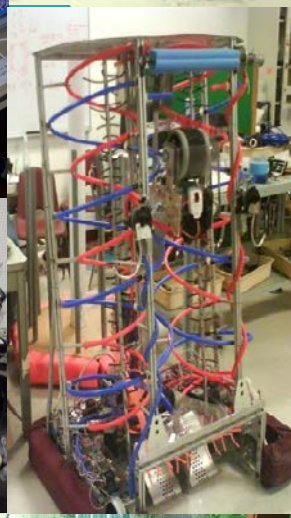
Background

Robotics
-MASLab
-UROP – Robust Robotics Group
-FIRST Robotics Competition
-DASCH Project

Relevant Classes
Past: 6.006/6.046, 9.66, 18.404
Current: 6.002, 6.S064

Undergrad, Year 2




Interests for projects

Bianca Homberg

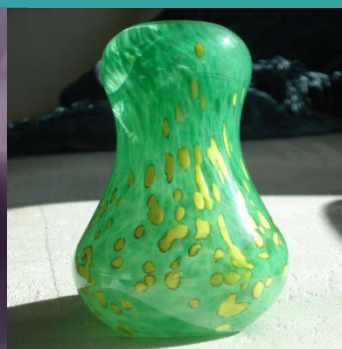
Robotics-related

Transforms dynamically to traverse varied terrains easily

Transform object by storing energy in springs, energy is released in a different way







Jennifer Jacobs
jacobsj@media.mit.edu

nd computation

DressCode

Open Save

```
fill(rect(300,350,700),60,60,60);

r1 = ring(300,350,20,150);
rMaster = ellipse(300,350,300);


r1 = rMaster+r1;
r2 = ring(300,350,20,100);
r3 = ring(300,350,10,50);

fill(r1,BLUE);
fill(r3,BLUE);
weight(r1,4);
weight(r3,2);
weight(r2,1.5);

def ring(x1,y1,n,dog)
   e = ellipse(x1,y1,10);
     repeat i=0:n:
        a = flower(0,0,5);
        r = 360/n*i;
        x = cos(r)*dog;
        y = sin(r)*dog;
        move(a,x+x1,y+y1);
        rotate(a,r);
        e = e+a;
    end
    return e;

end

def flower(x,y,n):
 e = ellipse(x,y,10);
 repeat i=0:n:
   r = 360/n*i;
   println("r="+r);
   e = e+petal(x,y,r);
 end
 return e;
end


def petal(x,y,r):
   a= ellipse(x,y,100,10);
   rotate(a,r);
   return a;
end
```

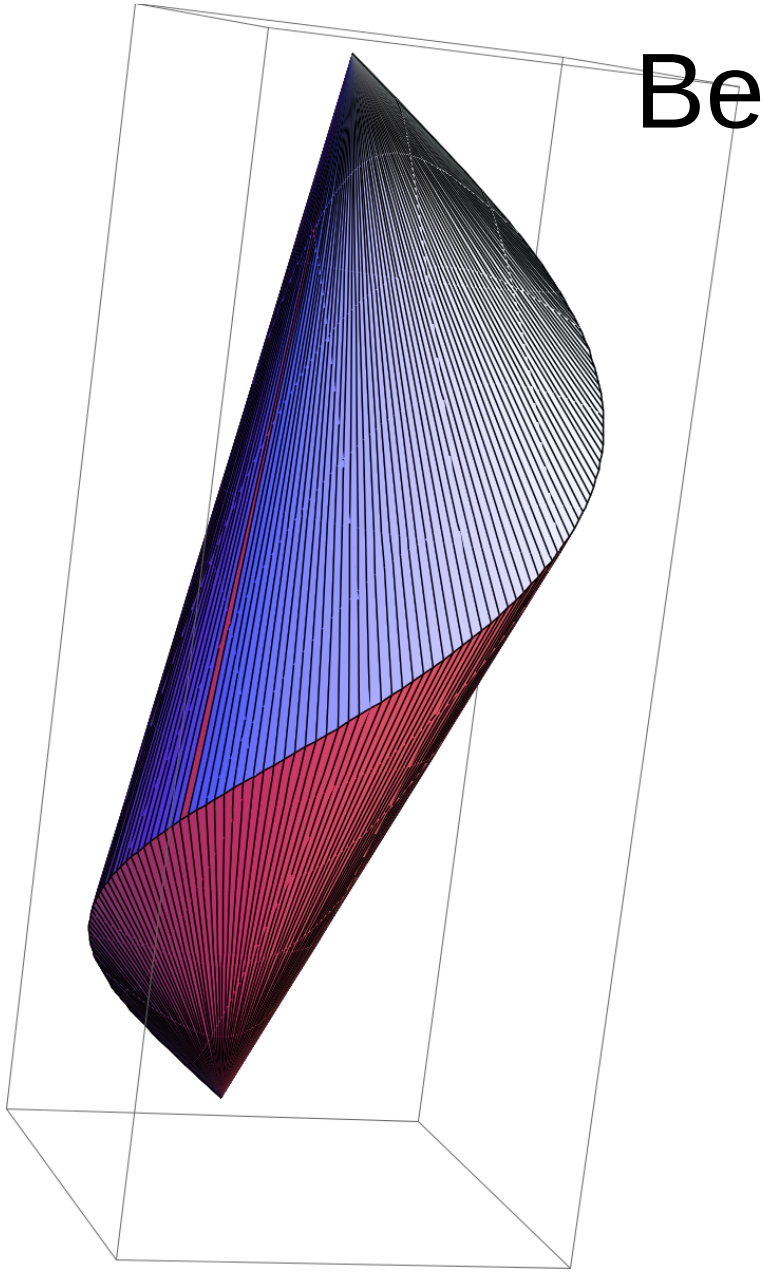
al tools to support fabrication

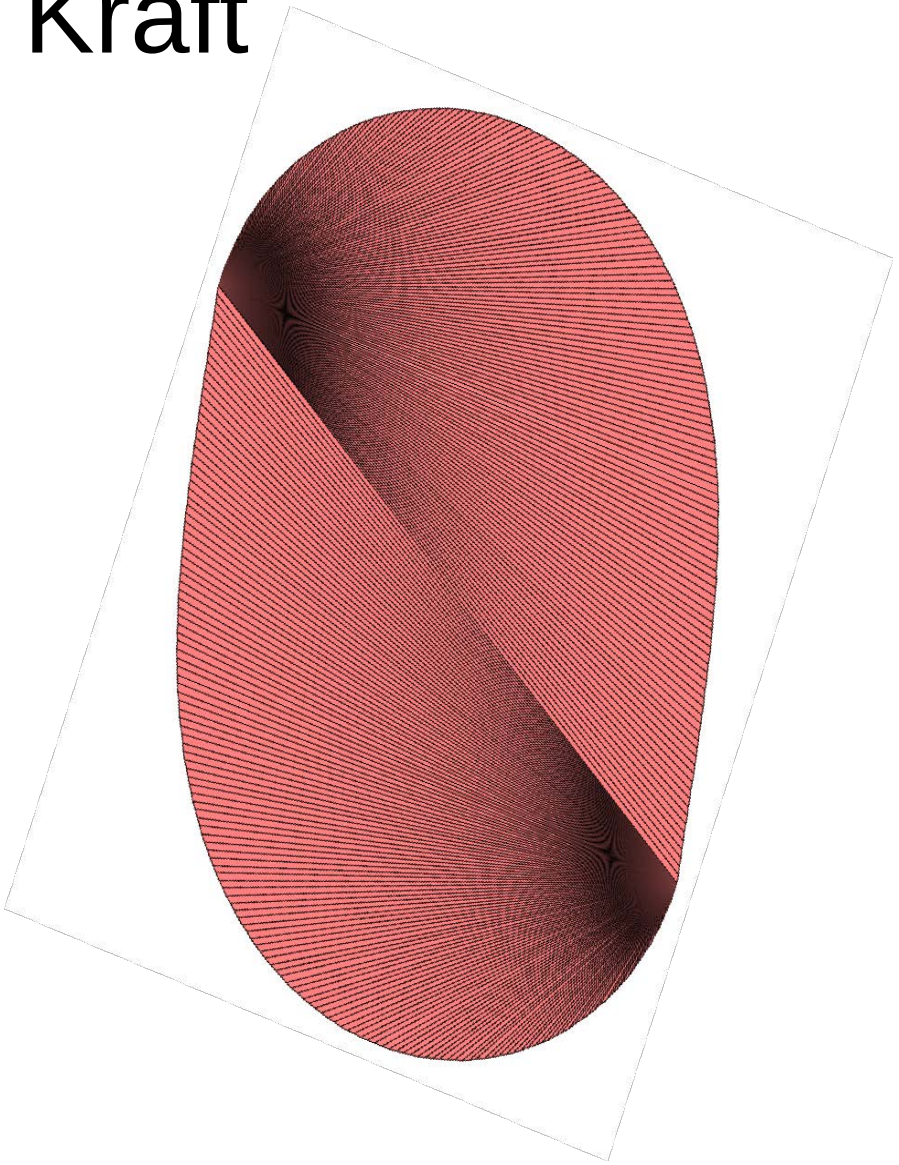
Ben Kraft
benkraft@mit.edu

Ben Kraft

- Sophomore in Course 18
- Took 6.849, and have other miscellaneous background in mathematical origami
- Interested in the more mathematical side of things, figuring out the mathematical foundations of what we can build
- Did research in mathematical origami/folding relating to pleat folding and pita forms

Ben Kraft

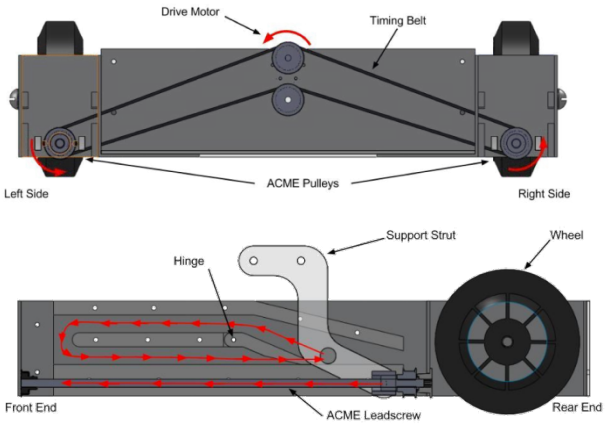




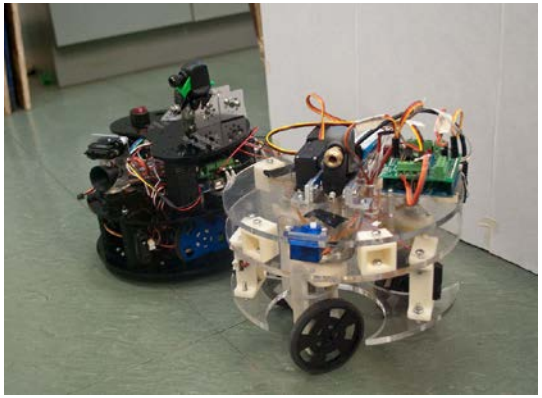
Will Langford
willl@mit.edu

Will Langford
(background)

MechE @ Tufts

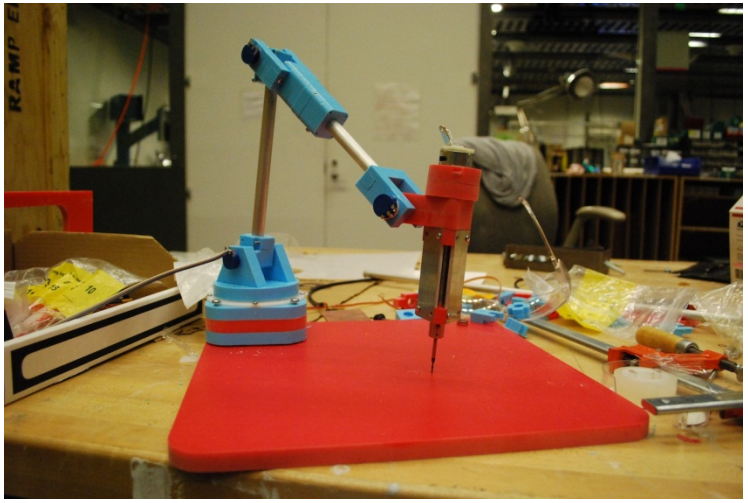


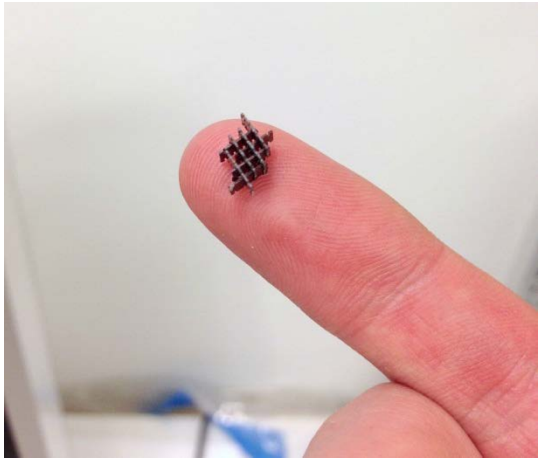
Tufts Robotics Club

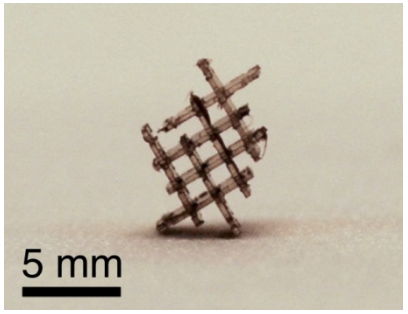


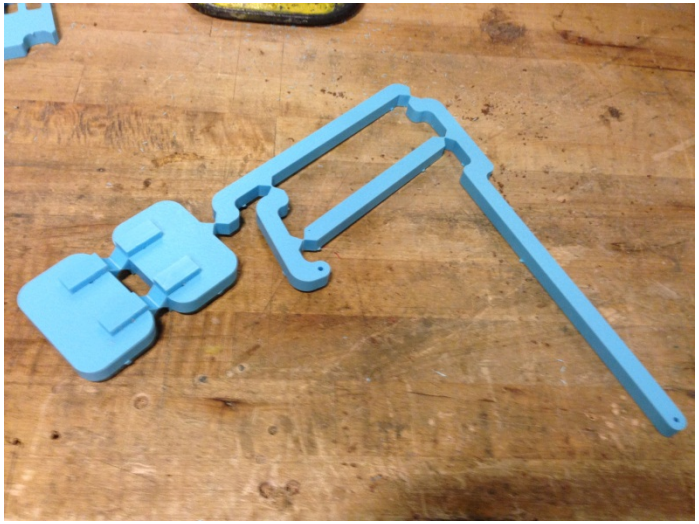
Makerbot

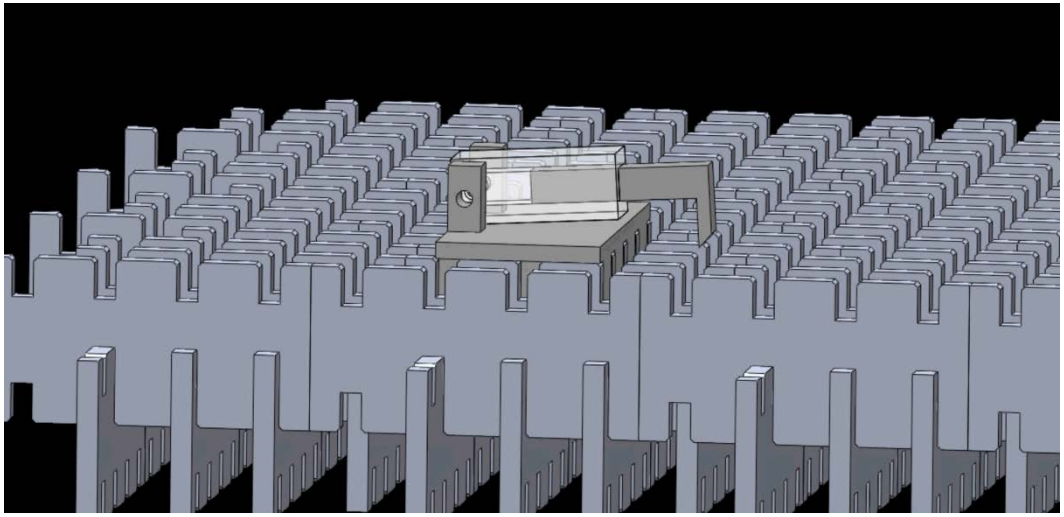
Will Langford
(current projects/interests)











David Lawrence
dlaw@mit.edu

David Lawrence

Undergraduate in mathematics,
electrical engineering, and computer science

Interests

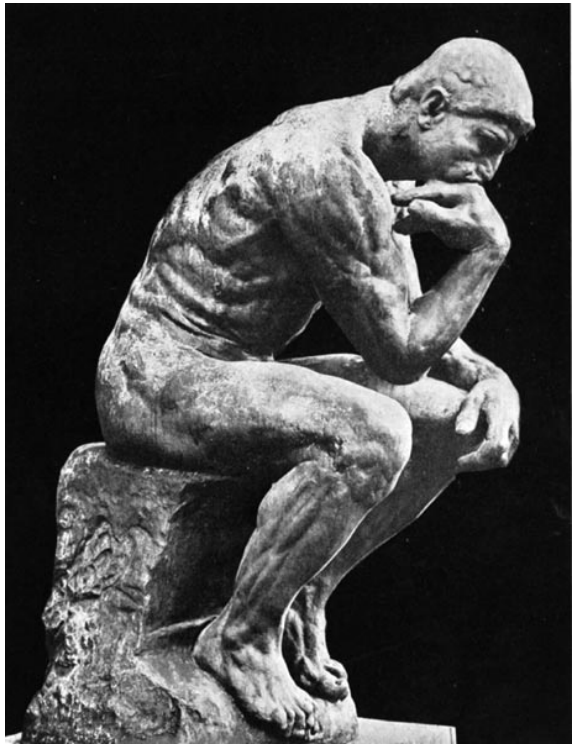
Embedded systems
Linux development
Power electronics
Machining
General cool things in math & CS

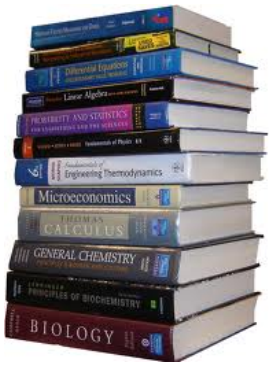
Projects

Mass Ave bridge, May 2011

Sunny Long
sunny_l@mit.edu

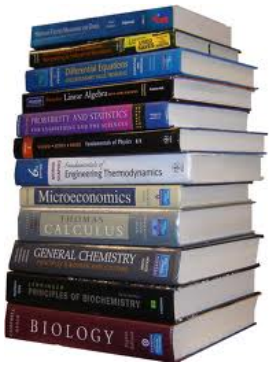
Sunny Long
Course 6 & 14





Sunny Long
Course 6 & 14

6.S080: Mechanical Invention through Computation



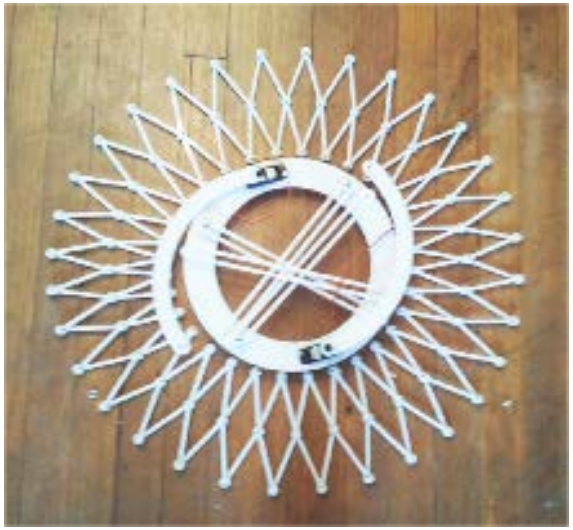
Paulina Mustafa
pmustafa@mit.edu

Expandable Hat

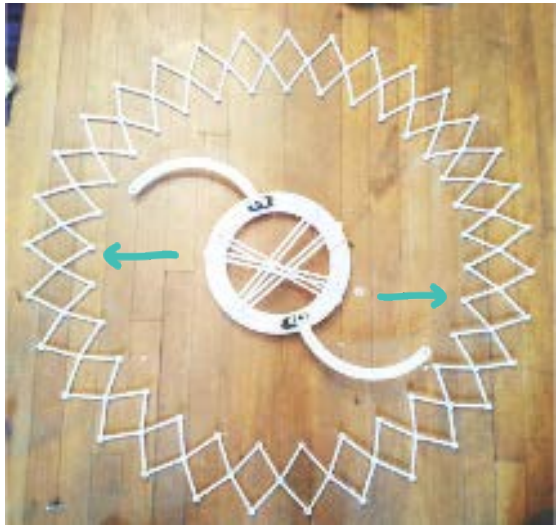
A hat that blocks just the right amount of light

light by expanding under strong light, and compressing under lower light. It is a proof of concept that explores interactive clothing and objects that respond to the

low light



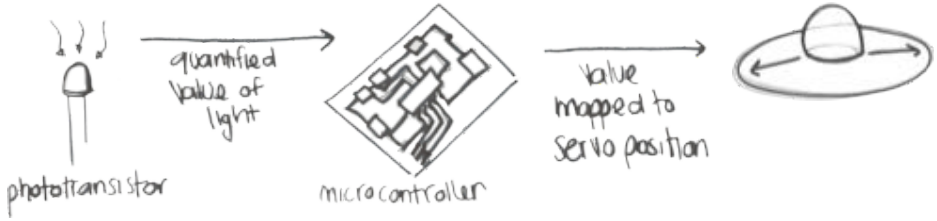
strong light

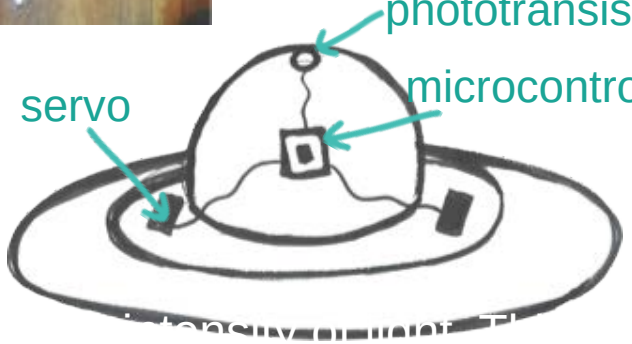


me and the hat

This is [redacted] first time I wore my fab-able expandable hat!

how it works:



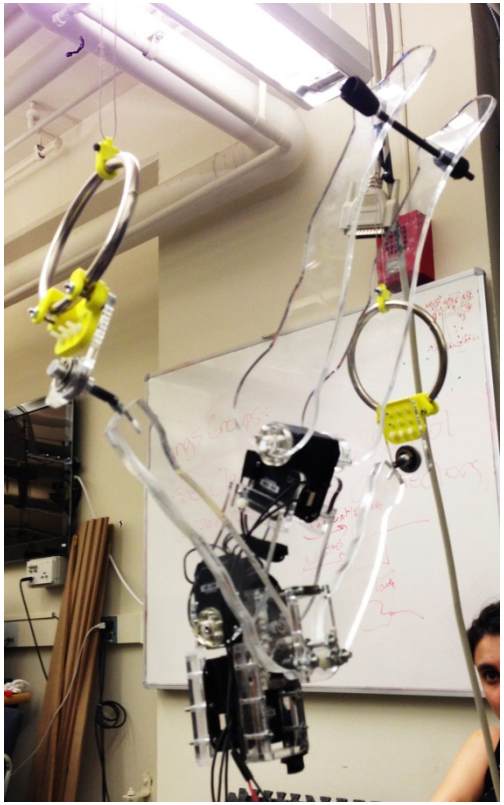


read by a Fabduino, which is a PCB that mimics the architecture of an Arduino and is programmable in Arduino IDE. The Arduino maps the value to a position of a servo and writes the same position to both servos, accounting for limits and velocity. The servos open/close two arms simultaneously, changing the size of the

Gymnast Robot

A robot that performs gymnastics rings routines

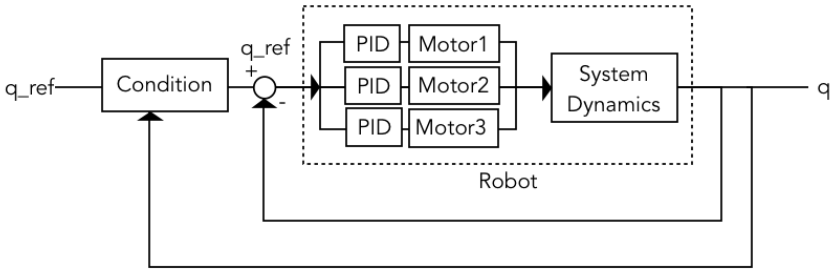
This robot has human-like proportions and joints that mimic human joints. It is able to perform a routine of different holds common in gymnastics rings events.

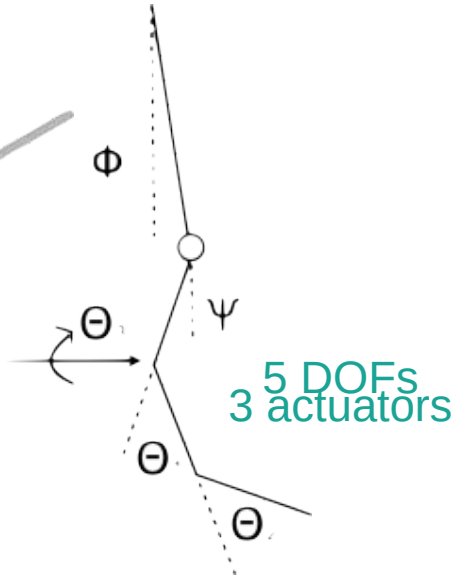


inverse iron cross

profile

feed forward controls





5 DOFs
3 actuators

actuators. One actuator drives a gear train that opens and closes the arms, and second actuator rotates the arms an orthogonal plane, together simulating human shoulder joints. The third actuator controls the legs. The robot was controlled using feed forward control and PID. It was team project, but I was the lead on the

Paulina Mustafa | Course 2

Philippa Mothersill
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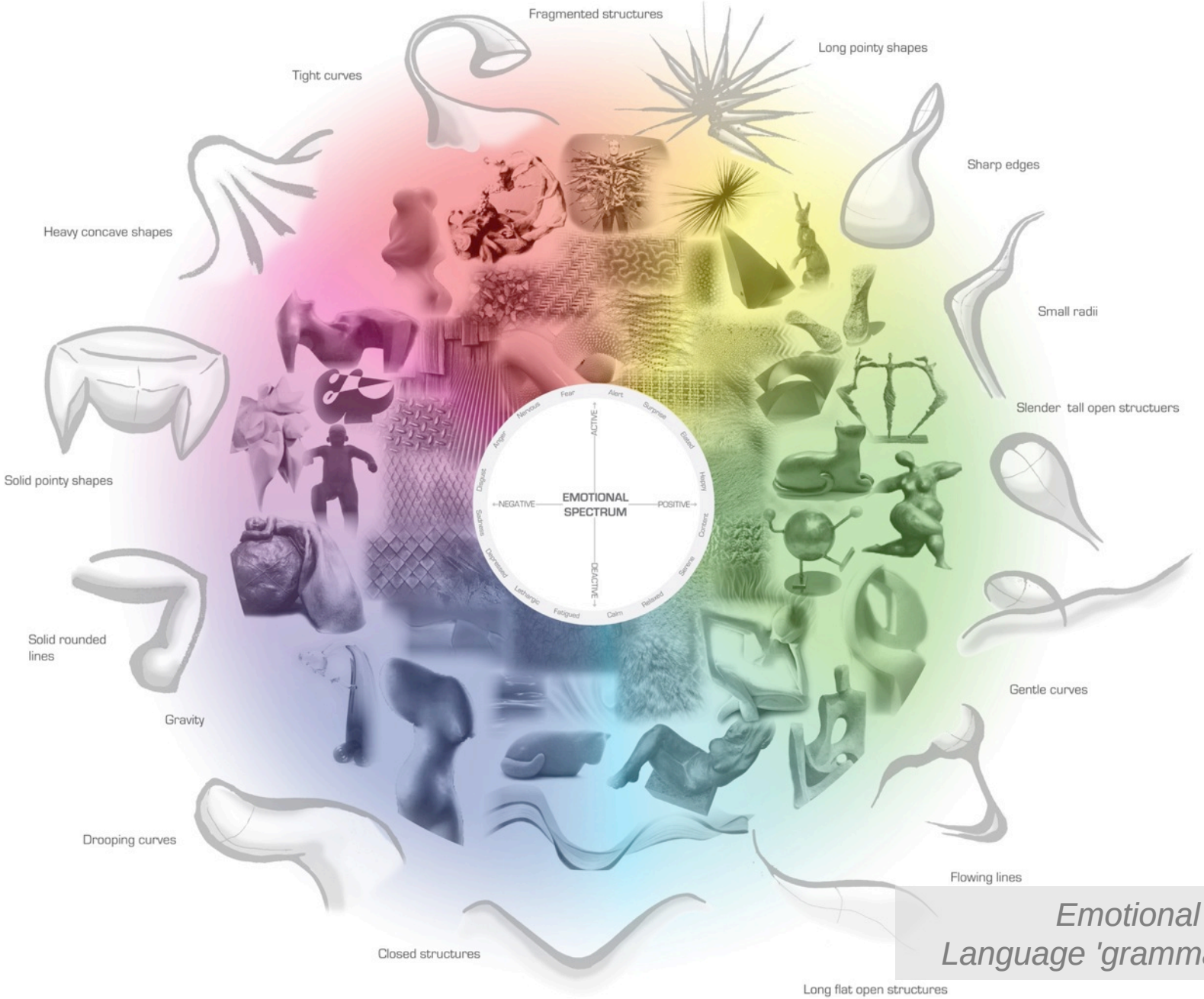
Tactile Allegory 1

Activating the design language of objects to communicate abstract emotive information through physical objects

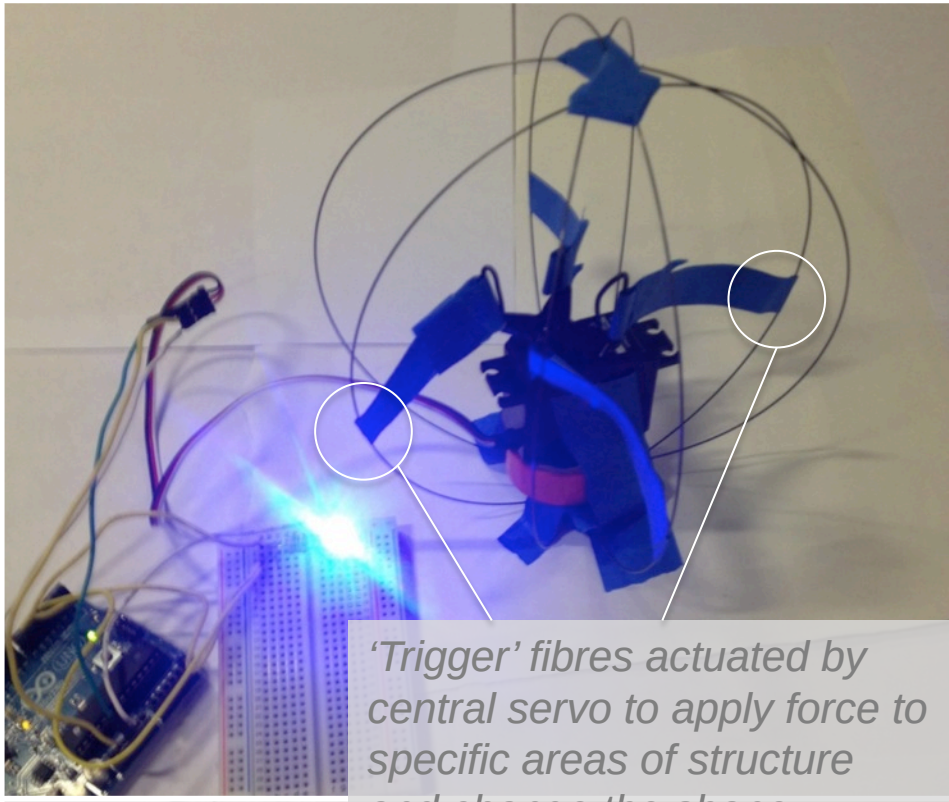


Emotional Design Language 'grammar' map

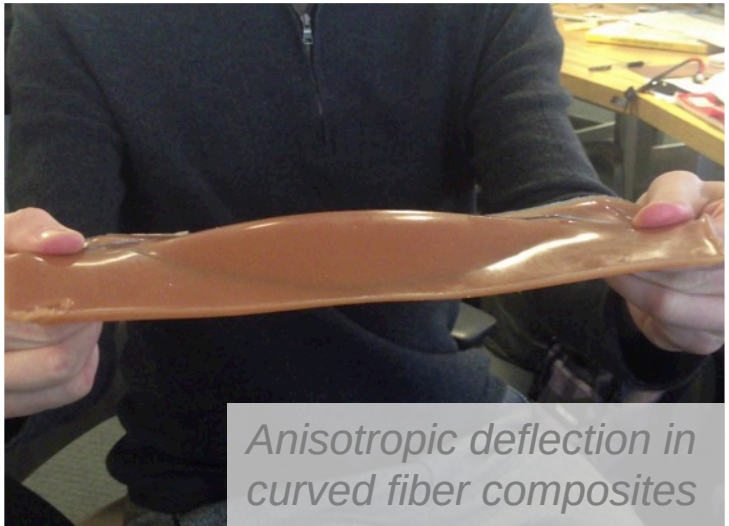
Dynamic composite materials

Solid fibres embedded in flexible matrix can change the form through varying mechanical properties of the material

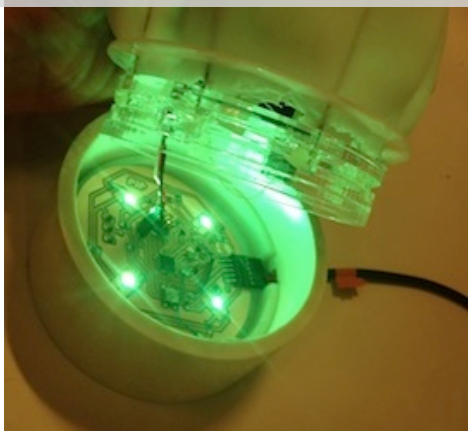
Variable bending stiffness in multi-material woven composites



'Trigger' fibres actuated by central servo to apply force to specific areas of structure and change the shape (video)

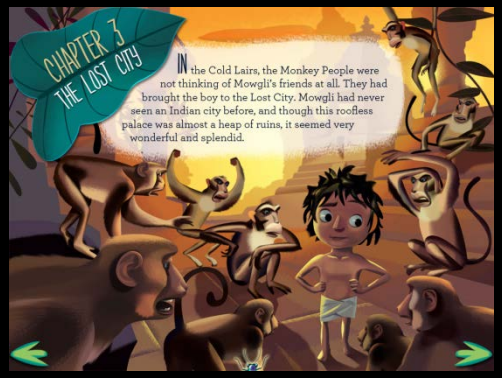


Anisotropic deflection in curved fiber composites



David Nunez
dnunez@media.mit.edu

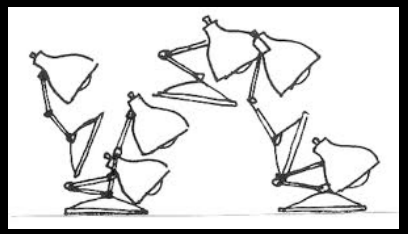
David Nunez
Media Lab: Personal Robots Group



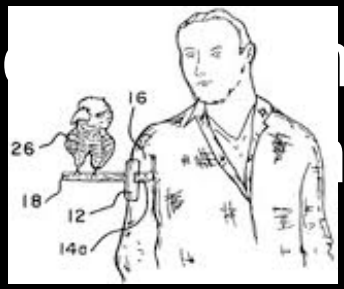
www.davidnunez.com
dnunez@media.mit.edu

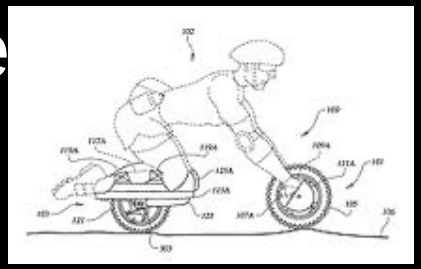
Things I Want to Make:

- Tool for designing Emotive, Parametric Animation of Mechanisms



- “Automatonimator” - Design Tool for Automaton / Toy Cams & Linkages
- Inventions via Algorithmic combination of bas e culled from patent i s





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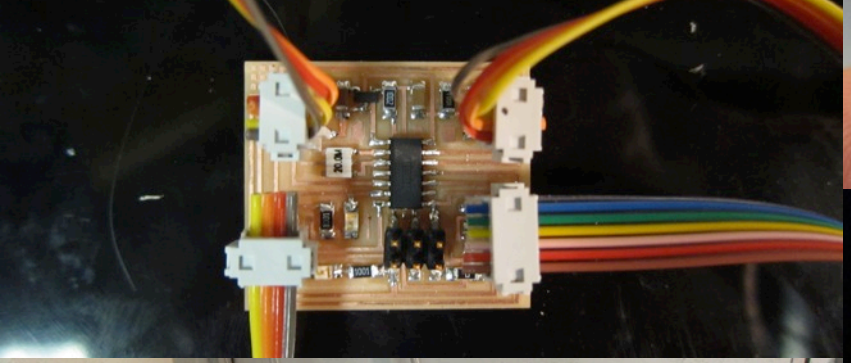
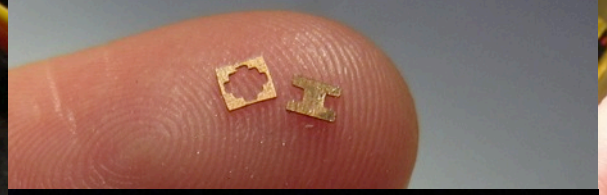
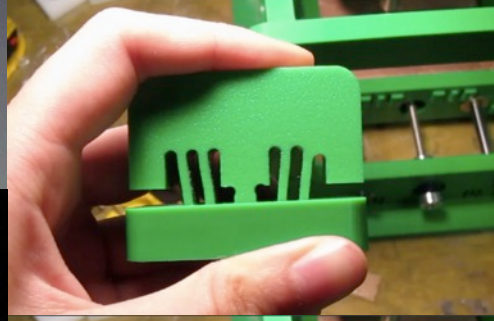
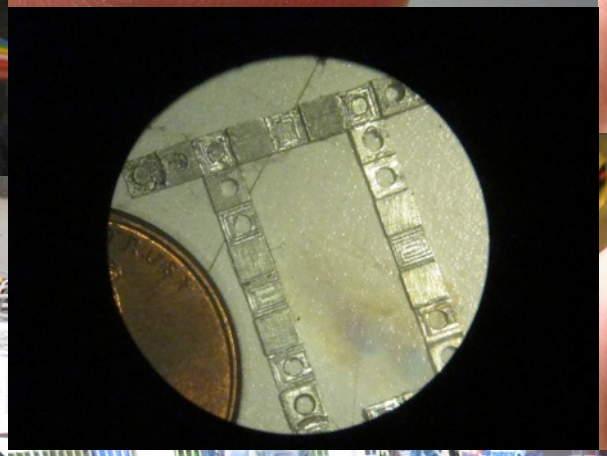
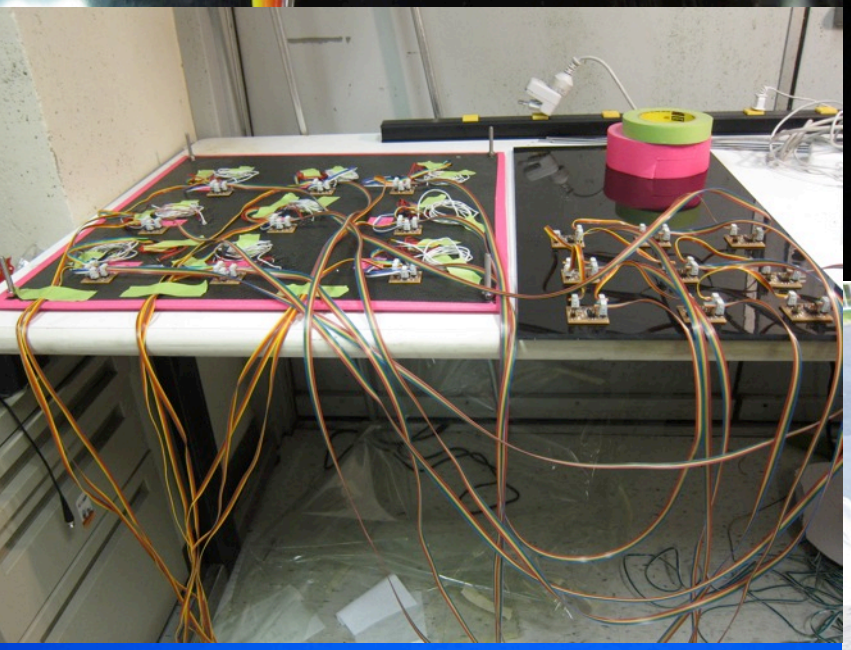
Nadya Peek
peek@mit.edu

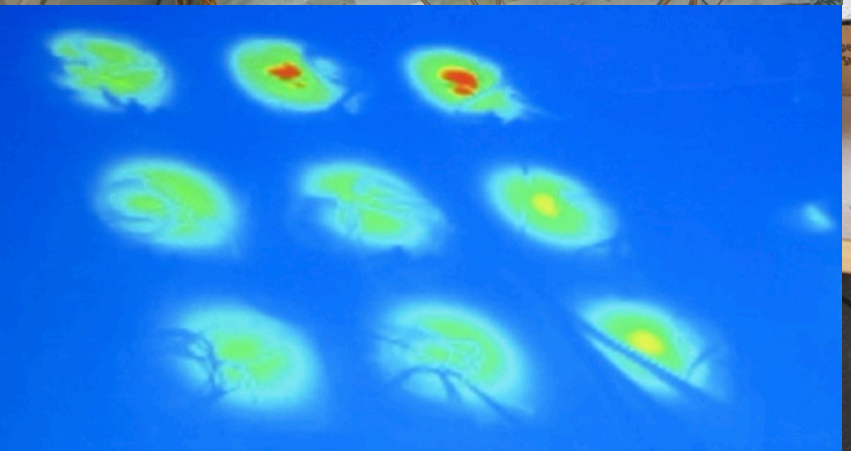




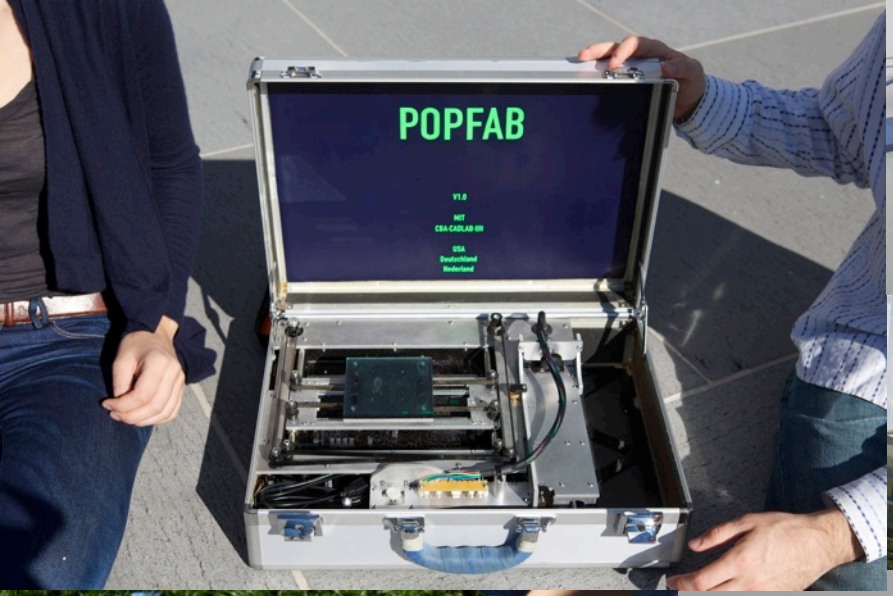


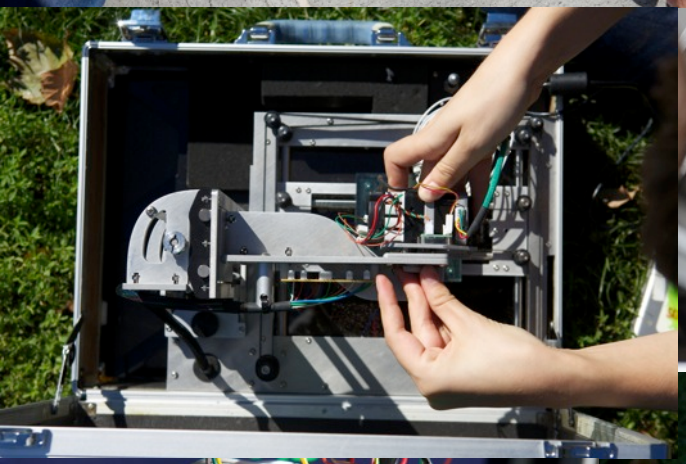


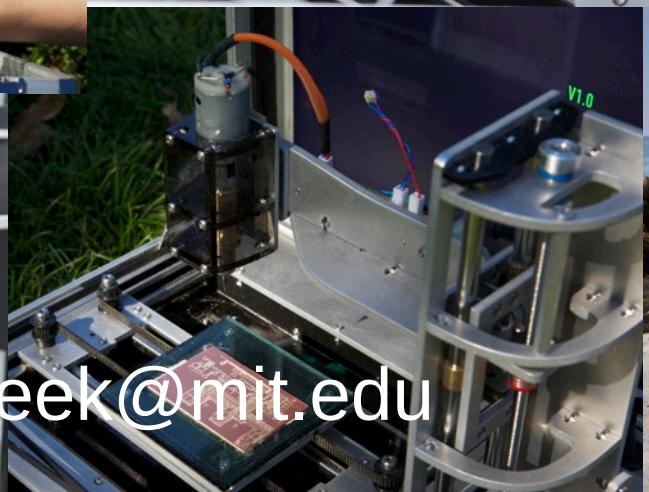




Nadya Peek – peek@mit.e







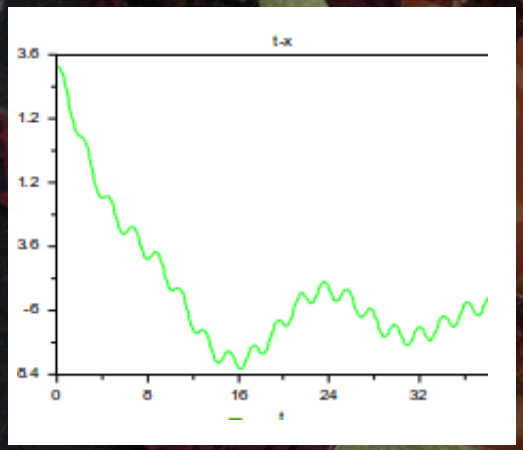
Nadya Peek – peek@mit.edu

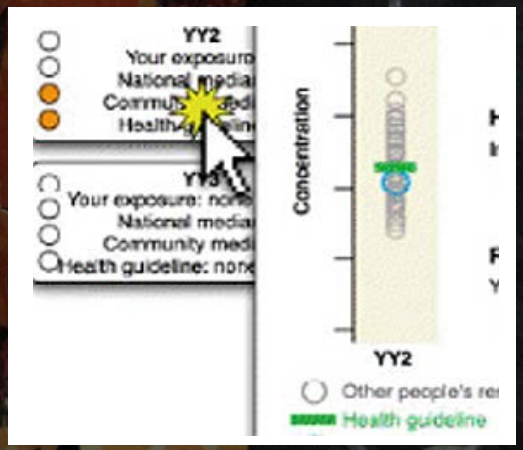
Laura Perovich
perovich@mit.edu

Laura Perovich

MIT Media Lab

Object Based Media





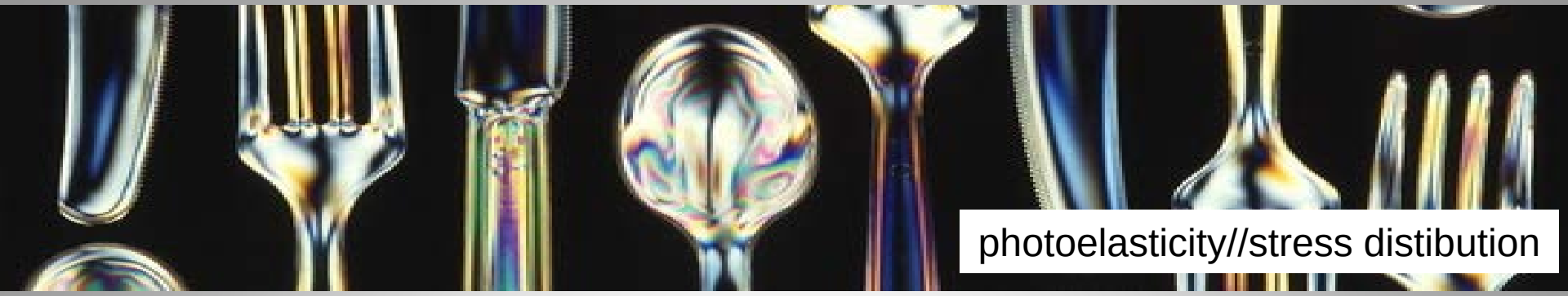

Textiles
soft shapes
swarm of size changing objects

Edwina Portocarrero
edwina@media.mit.edu


robert lepage


pina bausch

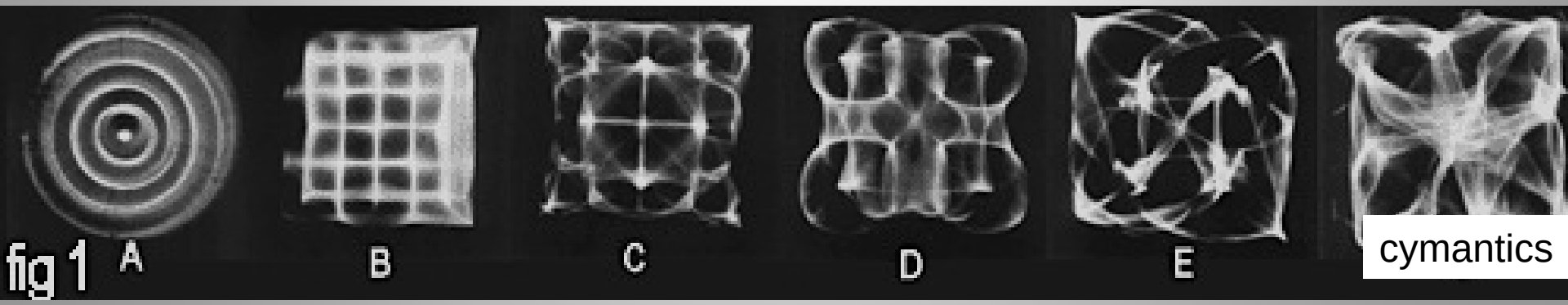

frank gehry



photoelasticity//stress distibution

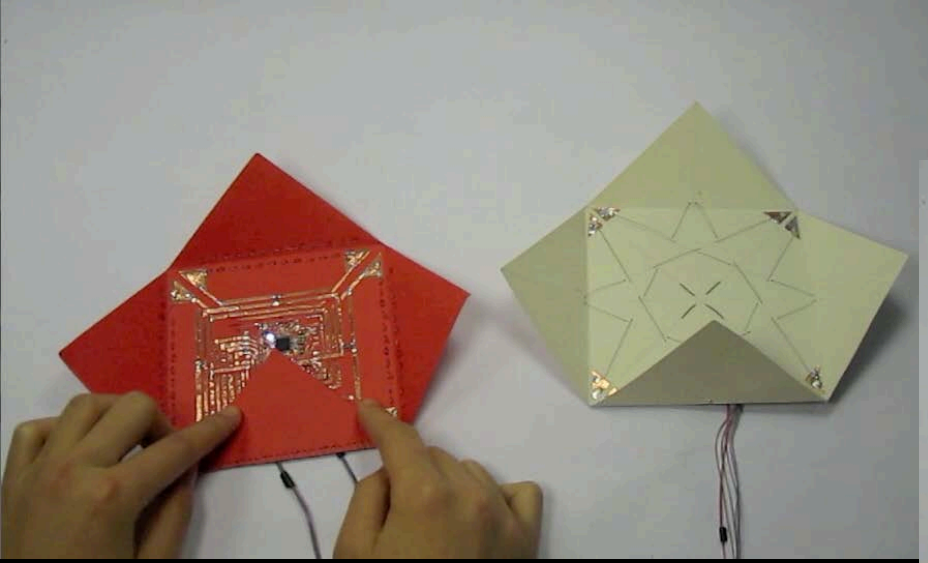
edwina@media.mit.edu

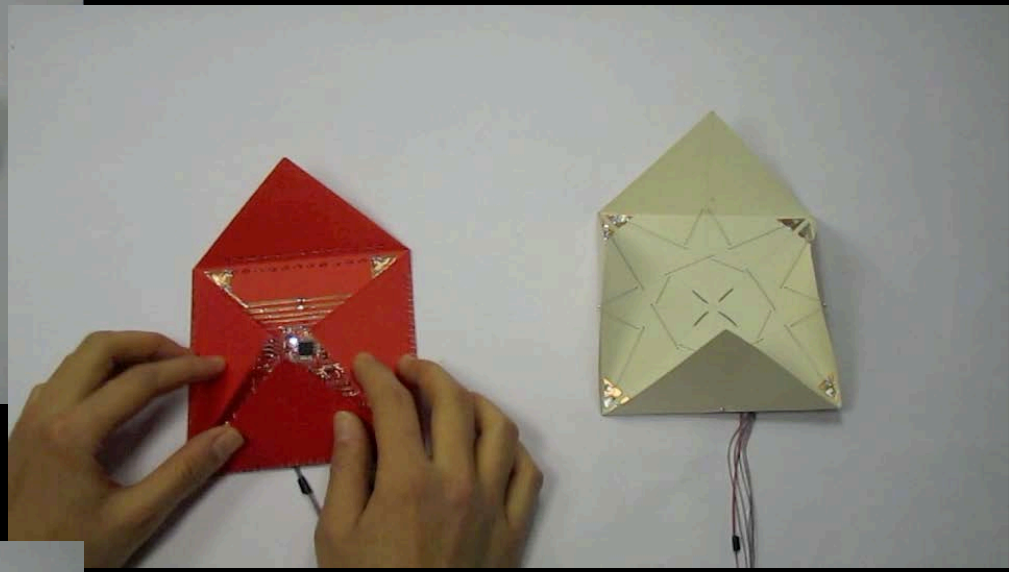
glenn canyon, utah

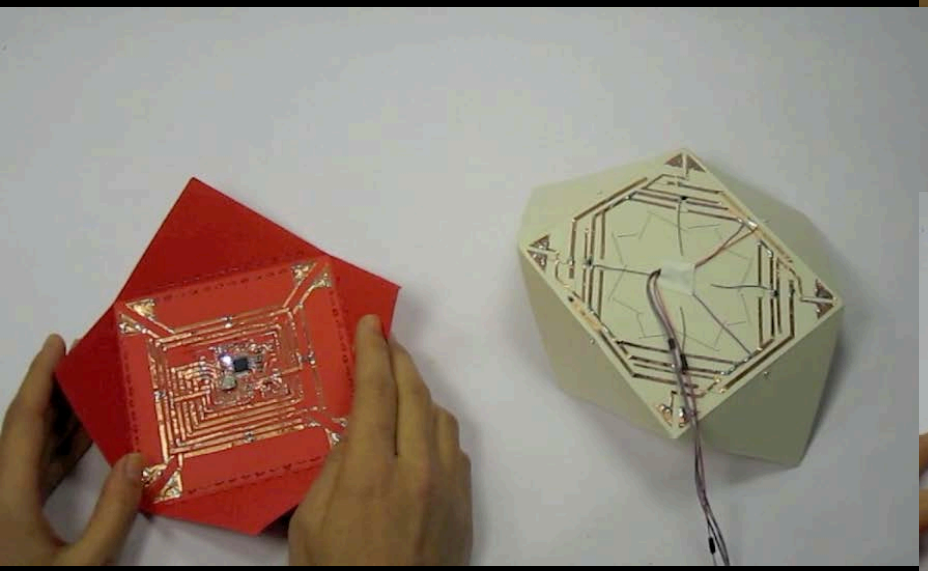


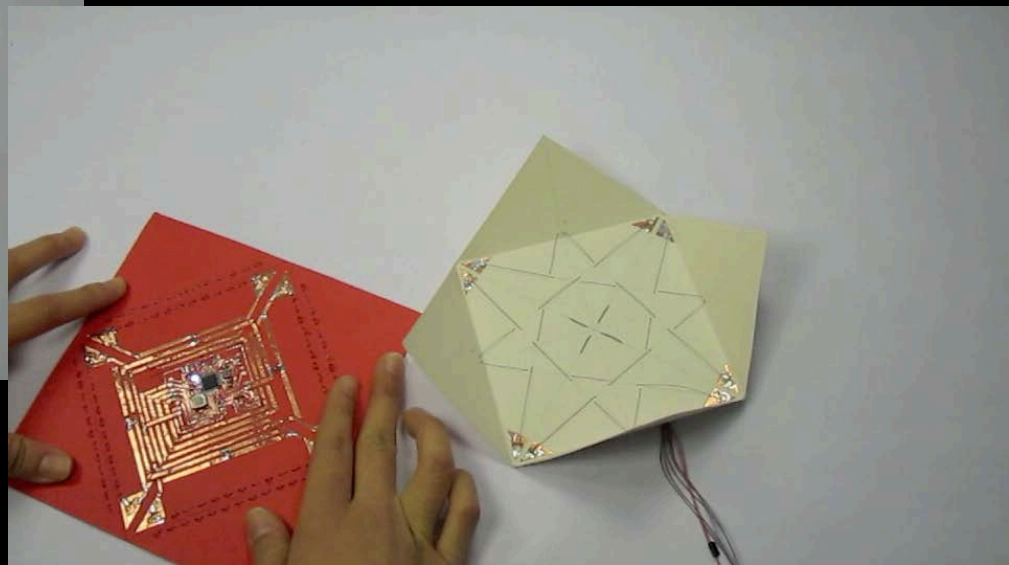
cymantics

Jie Qi
jieqi@mit.edu





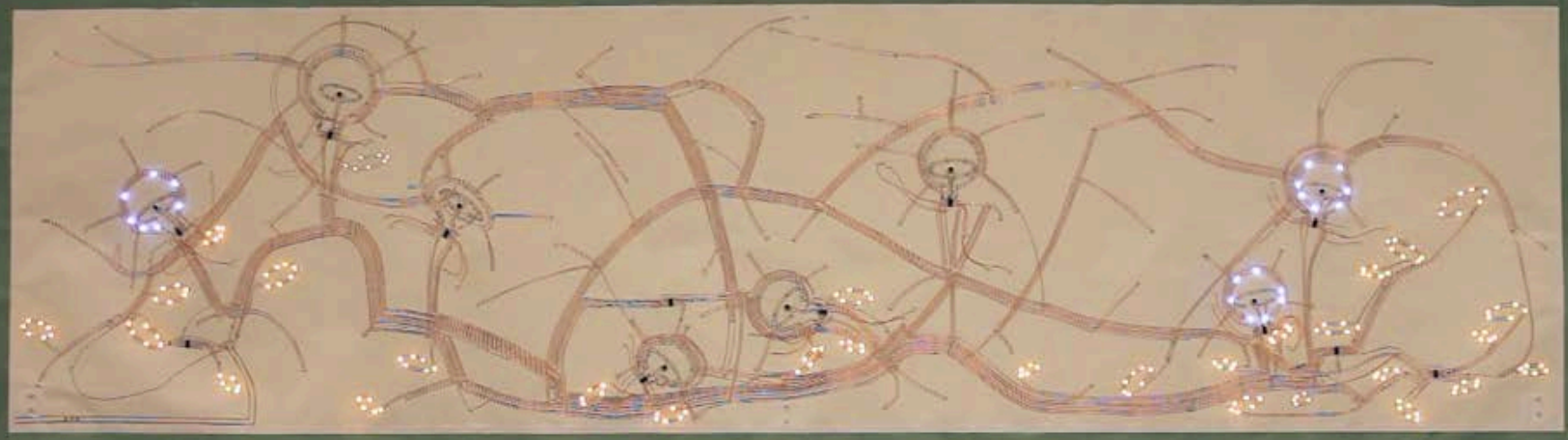





蒲公英图


蒲公英图


蒲公英图

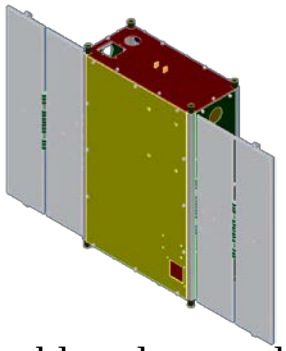


Michelle Rosen
mrosen@seas.harvard.edu

Michelle Rosen

- First year PhD student in Mechanical Engineering at Harvard
- BS in Mechanical Engineering from University of Maryland
- Microrobotics Lab - intermittent (flapping and gliding) flight
- Interested in computational modeling, fluid dynamics, small mechanisms

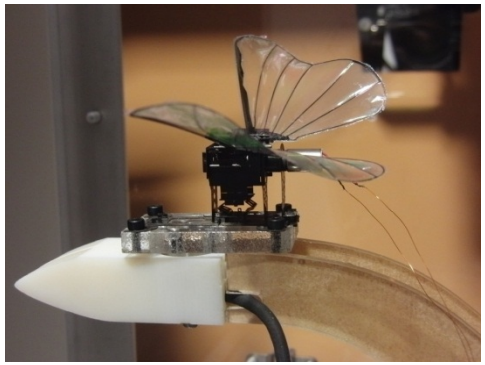
- Past and current projects



Deployable solar panels for Small Satellite (NASA Internship)

"Pop up" jumping and gliding microrobot

Mobile intestinal imaging robot



Current Project – Meso-scale intermittent flight robot

- Background in mechanical engineering, including design, prototyping, and modeling

George Samartzopoulos
gsamar@mit.edu

George Samartzopoulos

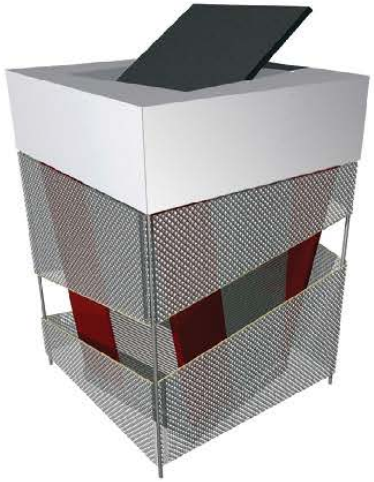
SMArchS Candidate 2014

Multiple uses – Urban Box can adapt to various programmatic scenarios. It becomes a product selling and information center. It can adapt to any type of urban space and withstand all climate conditions.
Multiple different intermediary spaces are formulated through the transformative nature of the Box. Many qualities of "in" and "out" spaces. Information thus is approached in multiple ways.

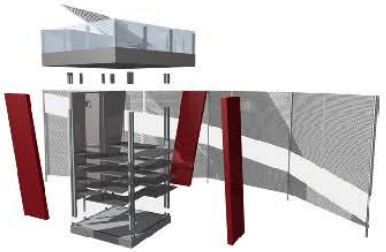
Here, function shapes form. In-out possesses a profusely protean nature, reinforcing the social consistency of Meaditerranean societies.

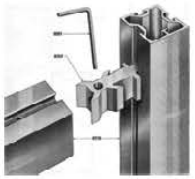
Indefinite and socially vibrant spaces are generated. A multiform, fragile, plural and ephemeral space.

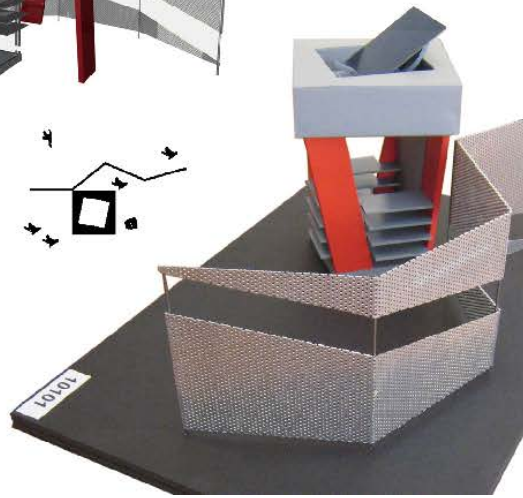
The folding sheath can acquire multiple forms and accommodate different uses; it becomes an organization element of the urban space.



The double shell of the construction generates satisfactory variable spaces between the sleeve and the inside core.
The distorted yet rational form of the inside construction allows access from all sides. The metal perforated surface can sustain interventions when placed in the urban environment, without dissolving the construction's overall aesthetic quality.
The mobile sheath of the construction can be used for suspending posters, products and even vegetation. Advertisements can be placed on the top of the construction.







URBAN BOX

The "Urban Box" in two different forms.

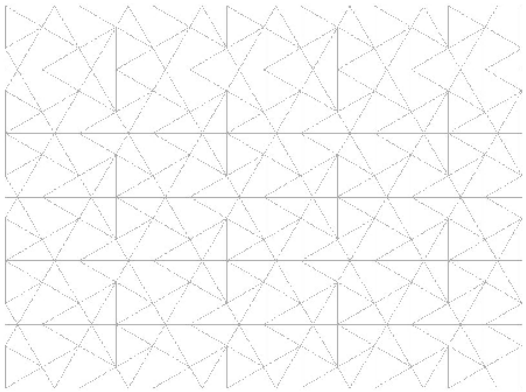
Exhibition of the Greek National Student Architectural Competition "Urban Box", in which I have obtained the 1rst Prize, at the "Benaki Museum", in Athens. The construction that I designed was realized and is presented at the atrium of the museum.
The competition was organized by the Hellenic Institute of Architecture and the sponsor of the construction was the Aluminium Association of Greece.

Adaptable foldable structures for temporary uses in Athens

George Samartzopoulos - Nora Granitsiwti
professor: Laskaris Nikolaos

Creation of a flexible structure, which can be formed according to the dimensions of each plot and the function it will accommodate.

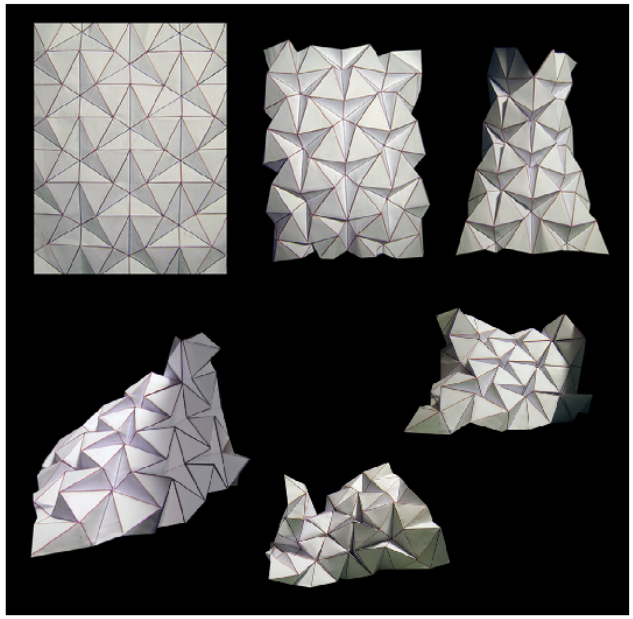
The construction can bear big weight, even though it is light in its composure. The unit acquires its form in space according to the way the forces are applied on the four sides.

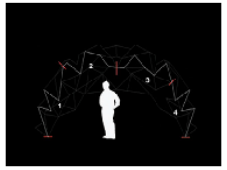


The origami technique allows a surface to acquire multiple forms.

The overall structure is formed from the multiplication of the basic unit. The material used is mainly cardboard and pvc.

Creating a surface with such parameters makes it possible to achieve strong structural qualities with less material, weight and also to achieve spatial configurations which can change according to the way forces are applied to the surface.





Henry G. Skupniewicz
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Henry Skupniewicz

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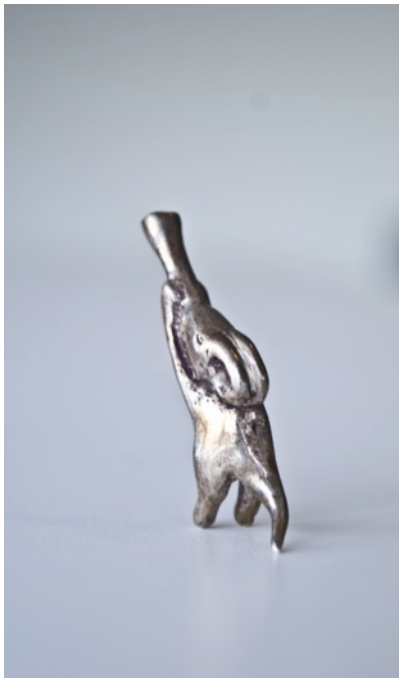
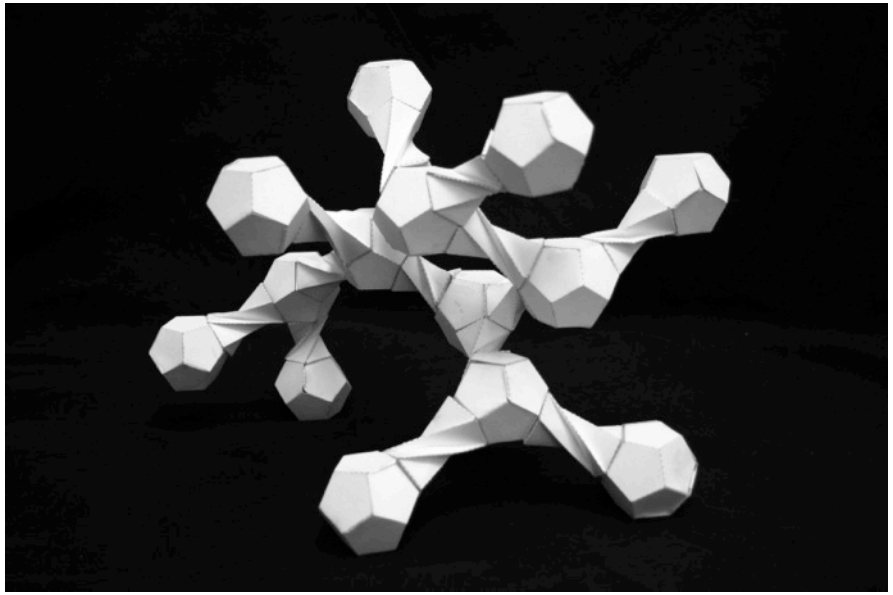
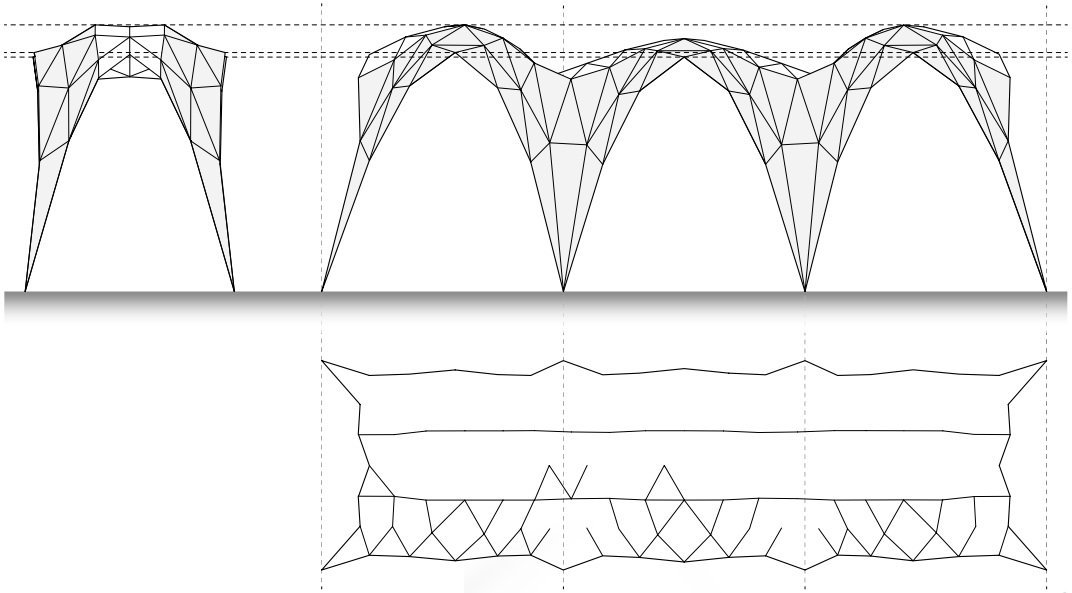
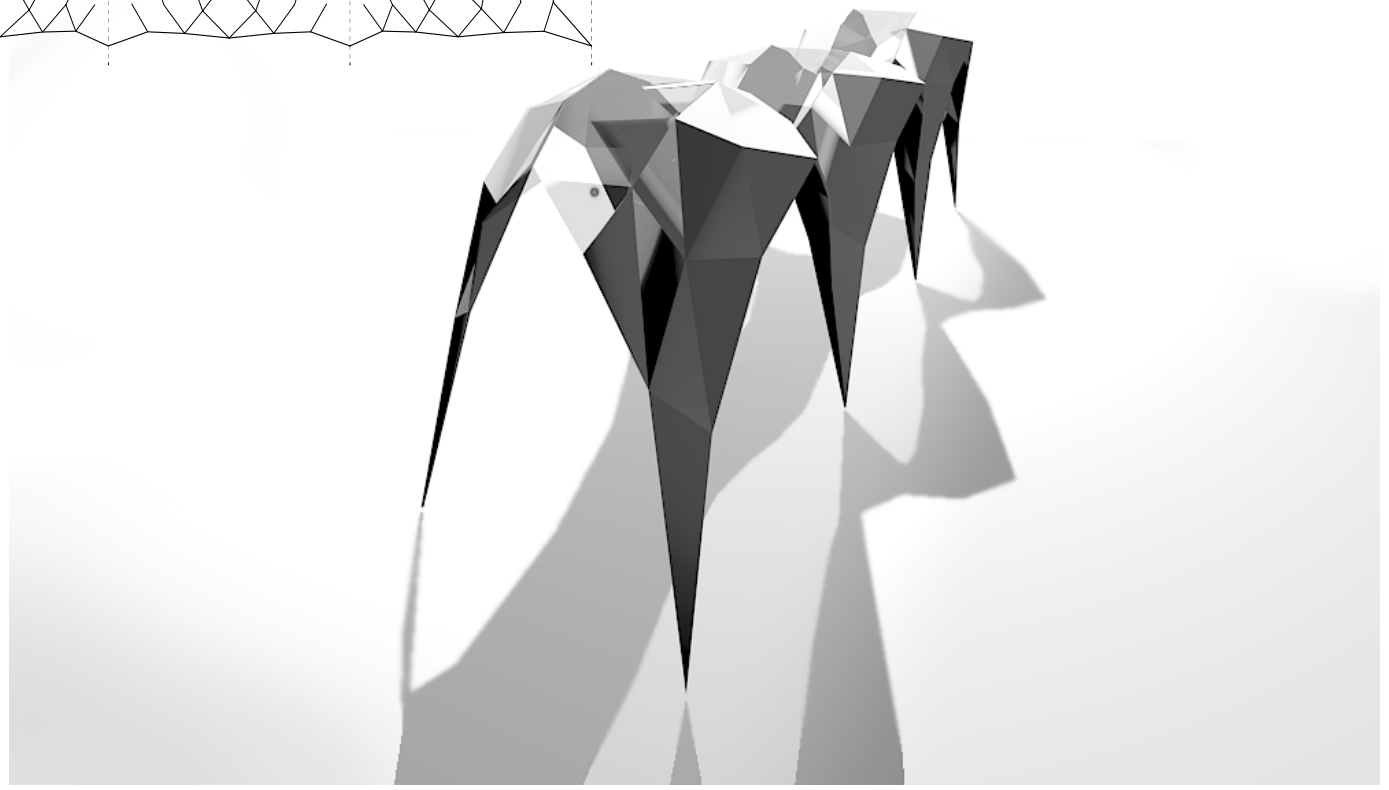
Department of Architecture
Design & Computation Group (MIT 2013)



- Interested in the intersection of design, computer sci., mathematics, and engineering.
- Loves graphic design and anything with “graphic” elements
- Big fan of toys and manipulatables
- Backgrounds in craft and fabrication in addition to CAD and related applications

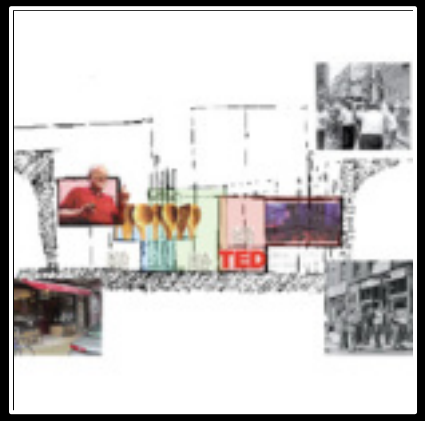


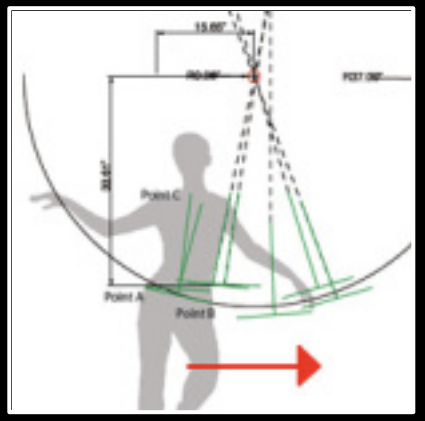




Sarah Southerland
sjensen@mit.edu

Sarah Southerland

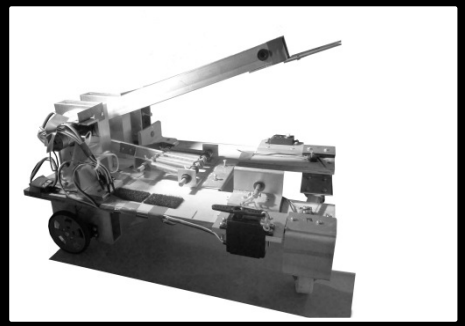




Relevant Projects

Robotics

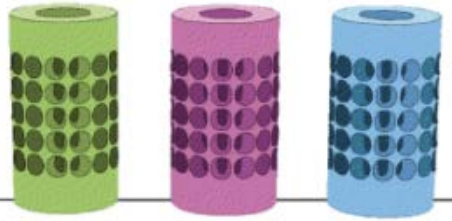
Botball®
STANDARDS-BASED EDUCATIONAL ROBOTICS PROGRAM

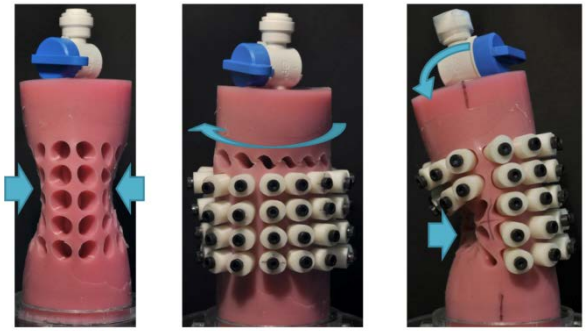


Buckigami

GAM

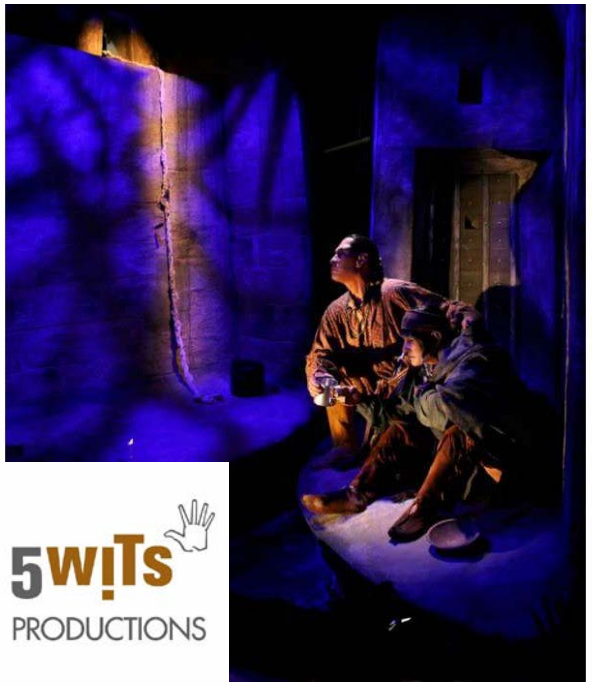
Geometric Artificial Muscle Project





Tiffany Tseng
ttseng@mit.edu

Luidia



5WITS PRODUCTIONS

IDEO

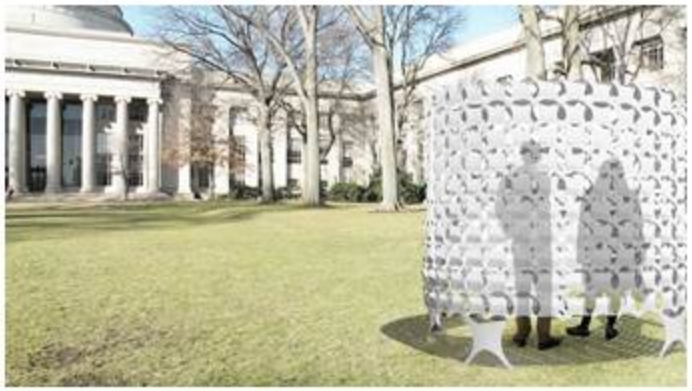
insight

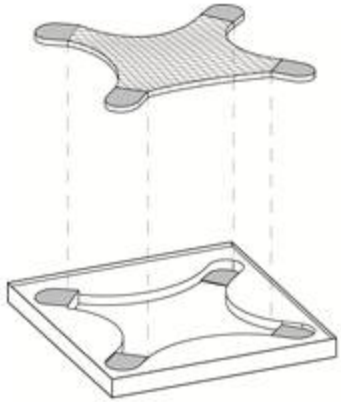
Tiffany Tseng

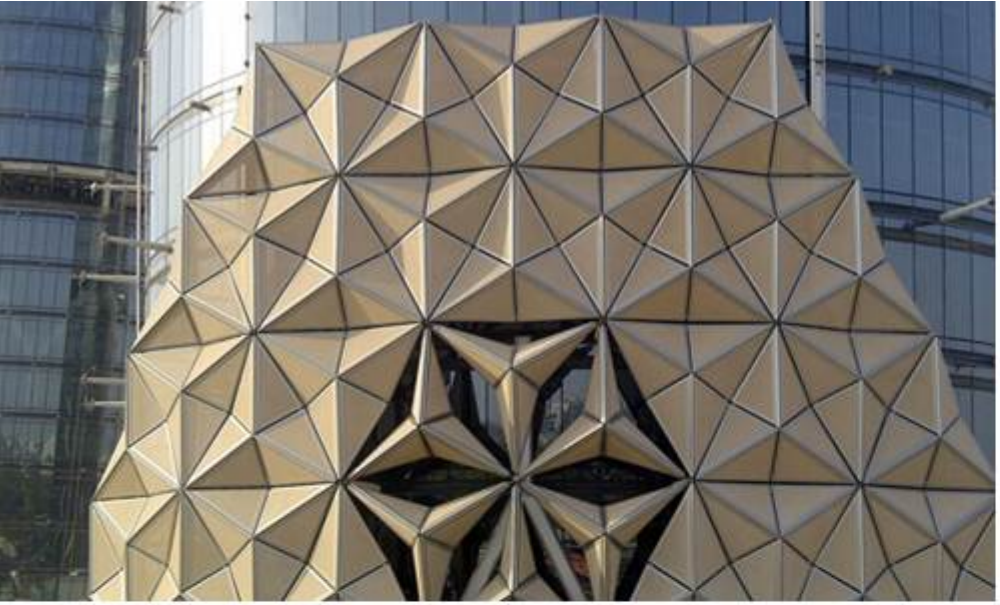
Lifelong Kindergarten
MIT Media Lab

Fisher-Price

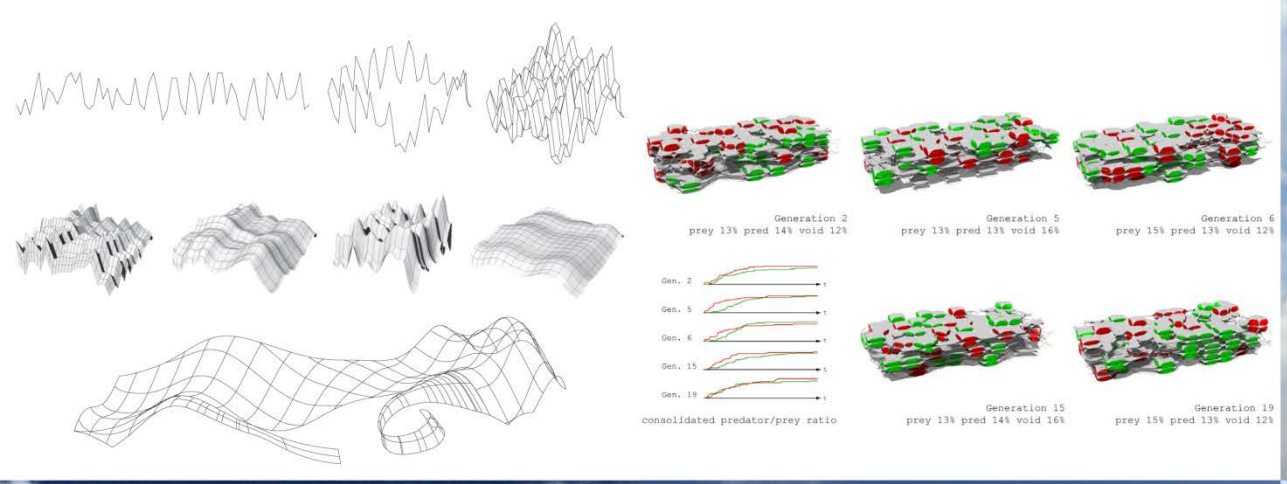
Shiyu Wei
shiyuwei@mit.edu

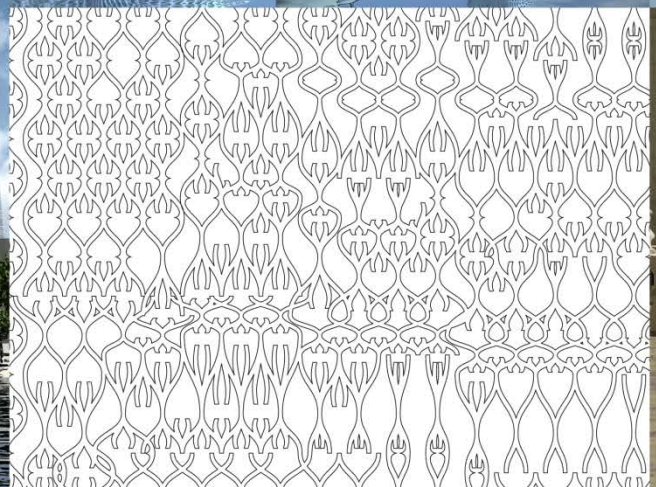






Thomas Wortmann
wortmann@mit.edu


Generation 2
prey 13% pred 14% void 12%
Generation 5
prey 13% pred 13% void 16%
Generation 6
prey 15% pred 13% void 12%
Gen. 2
Gen. 5
Gen. 6
Gen. 15
Gen. 19
t
consolidated predator/prey ratio
Generation 15
prey 13% pred 14% void 16%
Generation 19
prey 15% pred 13% void 12%



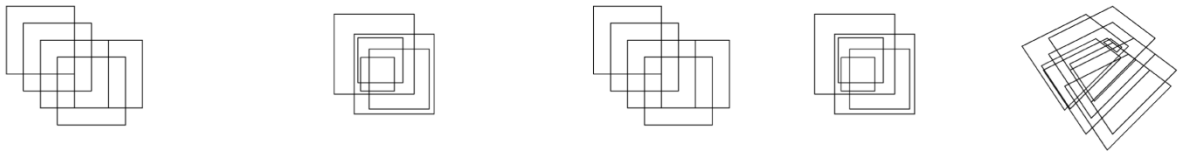
RECURSION

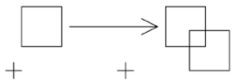
EMBEDDING

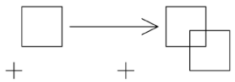
BASIC SG

REGULAR SG

PARAMETRIC SG





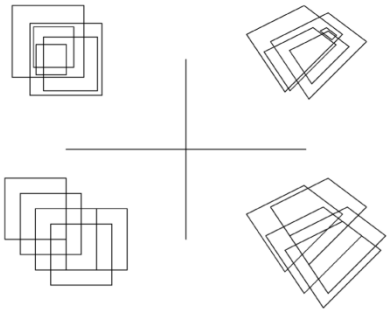


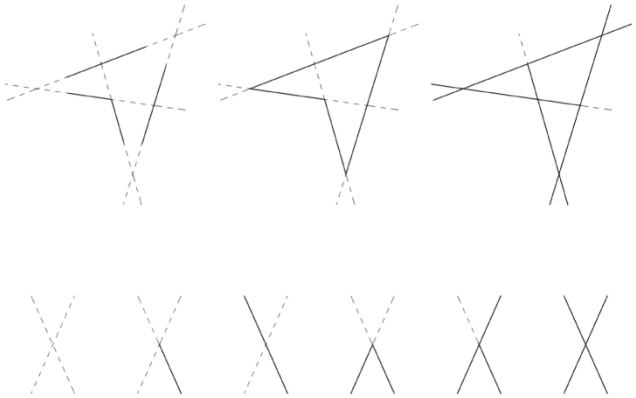
NON-PARAMETRIC
(without open terms)

PARAMETRIC
(with open terms)

EMBEDDING
(i >= 0)

IDENTITY
(i = 0)





VISUAL

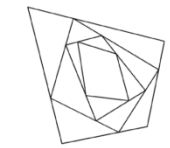
EXPLICIT
METHODOLOGIES

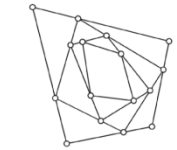
DESIGN
FREEDOM

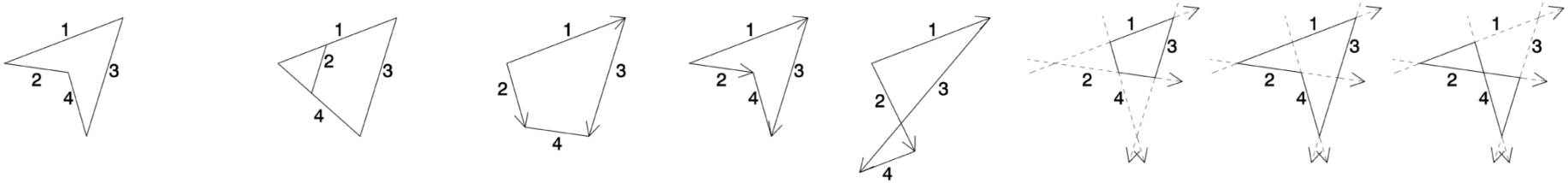
CALCULATING

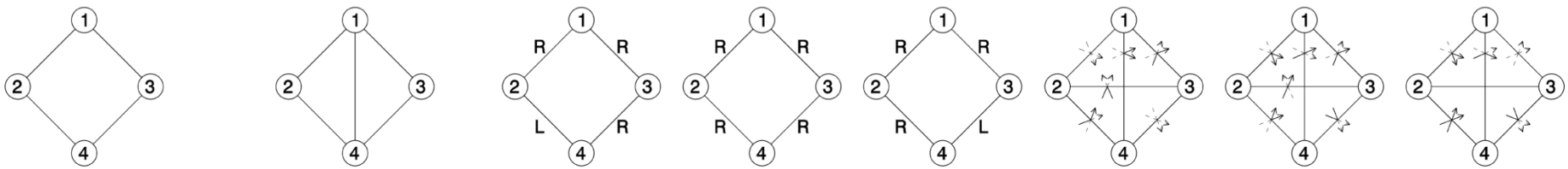
SHAPE

GRAPH

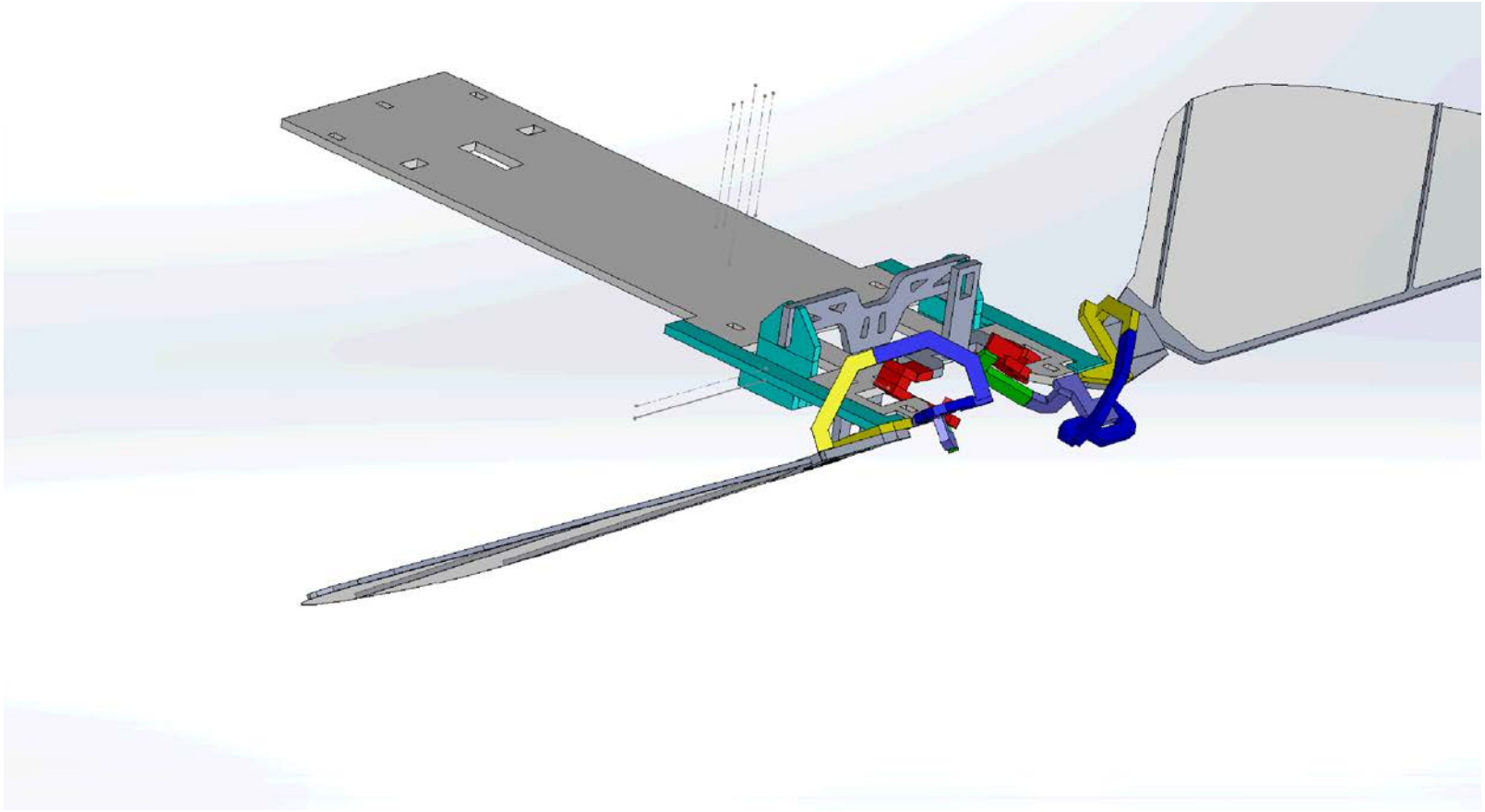




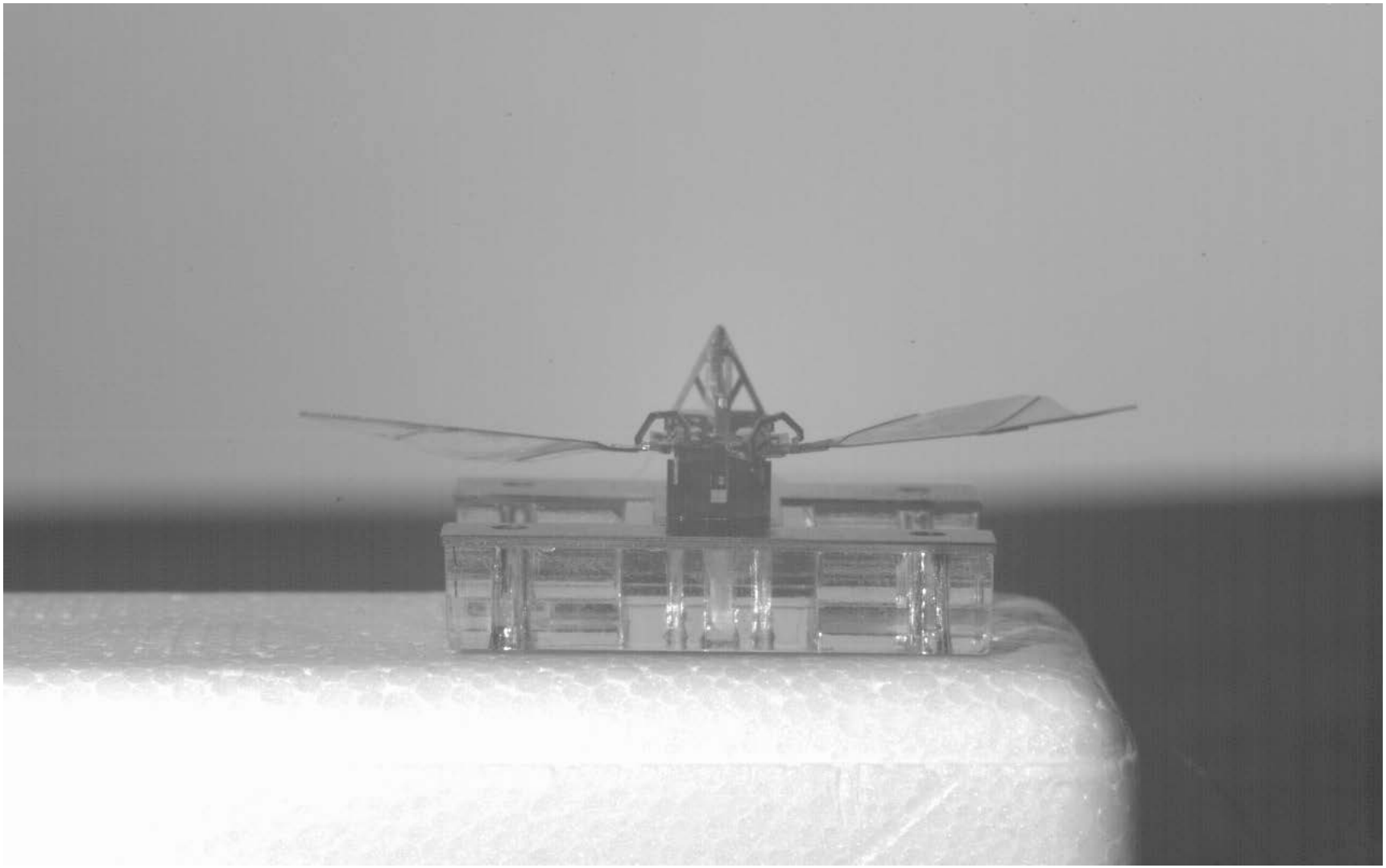




Zhi Ern Teoh
zhiernteoh@seas.harvard.edu



(Power and control actuator driven at 1 hz but 90 deg out of phase)



Xiaoyue Zhang
xiaoyue@mit.edu

Xiaoyue Zhang

Senior in EECS, Math

Experience in

- Coding
- Building basic things
  - Furniture, ice slide, pulley system...
  - Maslab

Interests

- Making pretty things
  - Flower bouquet
  - Bike wheel POV

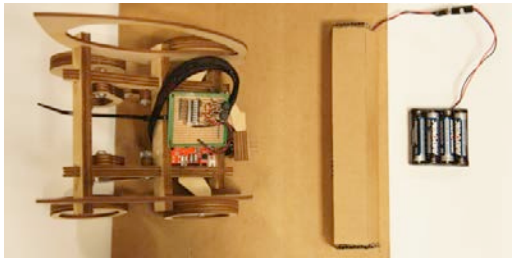
- How to design origami and linkages that do what I want them to do

Jason Gao
jasongao@mit.edu

Jason Gao

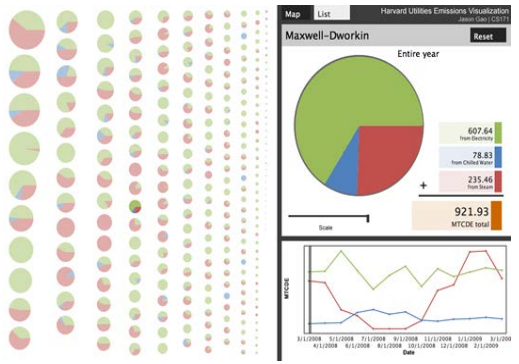
Context-sensitive UI

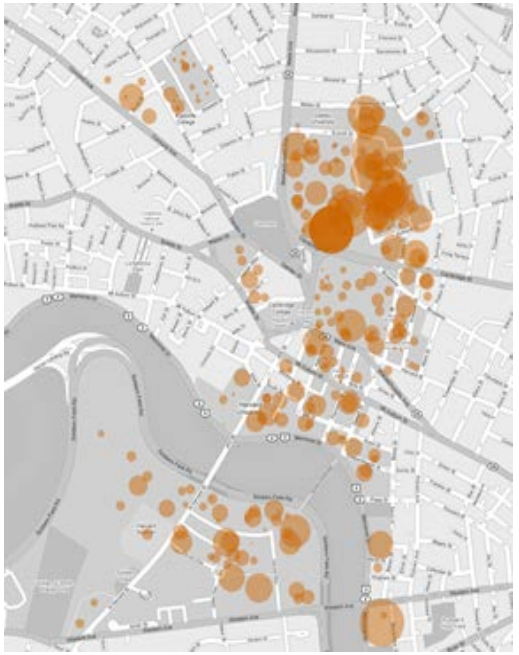
Nokia Research



Free-alignment EV Charger

4.557J Living Labs

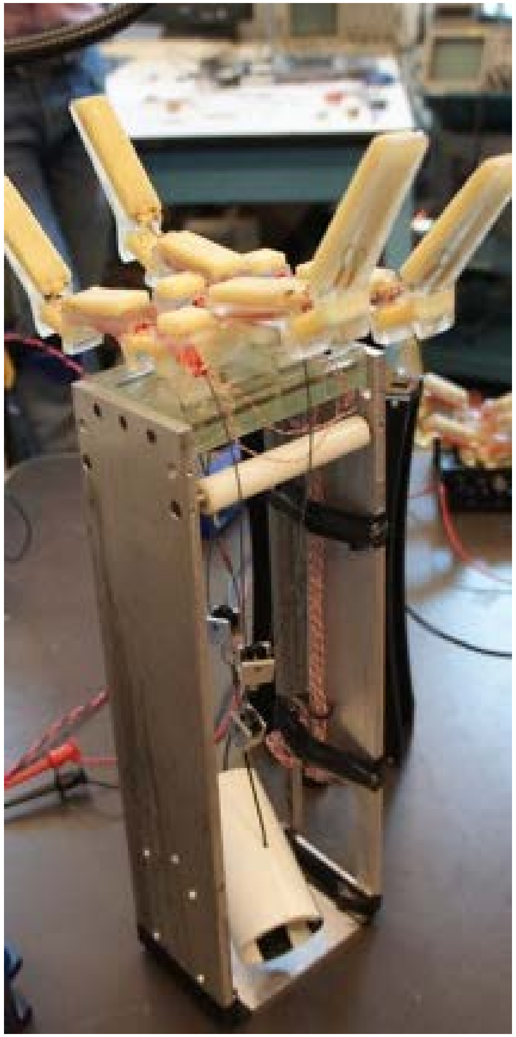




Emissions Visualization

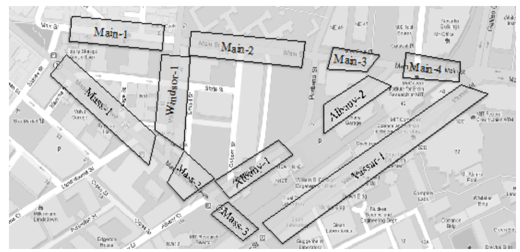
CS 171

Jason Gao



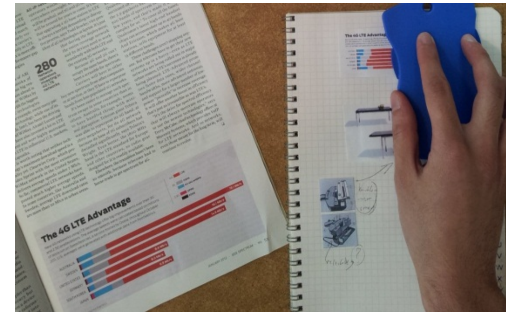
Under-actuated Systems

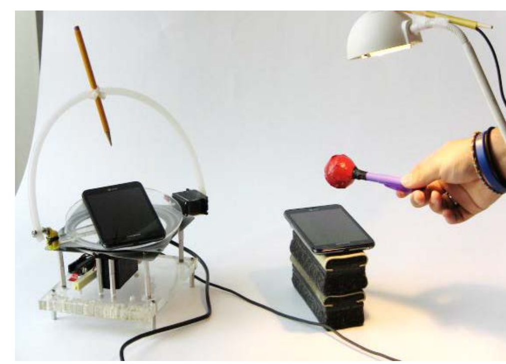
Harvard Biorobotics Lab



Distributed Systems

Li-Shiuan Peh Group





Tangible User Interfaces

MAS.834