My uncle ordered popovers

from the restaurant's bill of fare.
And, when they were served,
he regarded them
with a penetrating stare

Then he spoke great Words of Wisdom
as he sat there on that chair:
"To eat these things," said my uncle,
"you must exercise great care.

You may swallow down what's solid
BUT
you must spit out the air!"

And
as you partake of the world's bill of fare,
that's darned good advice to follow.

Do a lot of spitting out the hot air.
And be careful what you swallow.

Dr. Suess to the children of the world

'I smell it every day, I live it every day.'
Vicki Dobbins, 76, River Rouge, MI
lives in close proximity to an oil refinery, a steel mill, two coal-fired power plants,
and a sewerage treatment plant. More on her persistent health issues later.

'I have a dream.'
MLK
A dream not been fully realized.

'It's going to take more than green washing.'
Cal Poly thesis student on the state of architectural design.
That's for sure.

Want to make a difference? Here's how – give more than people expect of you.
OK, I wrote that.

Studio 401_design matters

We make things better

See https://calpolythesis.weebly.com/ for more info. Write me if you have questions.

Key words: decentralizing, bundling, networking, social equity, testing, shaping, sounding-out, ecology, materials, technology, discovery, creativity, making a difference, tactical urbanism, imagination

Provocation, unlearning, and challenging our accepted notions of reality have long been part of this studio, and the references below may provoke your thinking. I do not endorse everything in each reference, nor should you, as we must heed Dr Seuss's advice and be careful what we swallow. That said, there are points made that may be influential as we apply our design skills to society. We as designers can do so much, we can use architecture to promote community; we can help people tell and build their story. Have a look at the mostly video references below. Should take about an hour. These references hint at the thesis seminar, which is geared to awaken, in ourselves and others, the need to broaden our frame of reference.

Education + Social Justice
Ken Robinson on creating an education system that nurtures (rather than undermines) creativity.
https://www.ted.com/talks/sir_ken_robinson_do_schools_kill_creativity?language=en

Guerilla gardening with Ron Finley in South Central
https://www.ted.com/talks/ron_finley_a_guerrilla_gardener_in_south_central_la

Environment
Suzanne Simard_ How trees talk and cooperate through biological pathways
https://www.ted.com/talks/suzanne_simard_how_trees_talk_to_each_other

Interview with Environmental justice pioneer Dr. Robert Bullard
https://archleague.org/article/climate-justice/?fbclid=IwAR3yJM-n7s_c18kL1UWRDD8KcTyuK4GjdMw6D-NRvXiwPjIQ9etVcagVpnA

Systemic Racism
Meant for kids – short and to the point
https://www.youtube.com/watch?v=YrHIQIO_bdQ

Architecture Criticism
Kate Wagner on the state of architecture
https://archpaper.com/2020/06/opinion-no-pr-chitecture-wont-save-us-from-the-pandemic/?trk_msg=EV4MPRFSQ7CK507NPSR8HGIIE8&trk_contact=NLVJBT8TU2DTKQONRVSL3JUJ5C&trk_sid=C43H9GU5DFPO9FDV2SFVQRANI8&utm_source=listrak&utm_medium=email&utm_term=Andr%C3%A9s+Jaque+reveals+theme%2c+team+for+the+2020+Shanghai+Biennale&utm_campaign=Late+Edition%3a+No%2c+%E2%80%98PR-chitecture%E2%80%99+won%E2%80%99t+save+us+from+the+pandemic%2c+Atlantic+City%E2%80%99s+Trump+Plaza+slate

Capitalism
George Monbiot Debunks Michael Moore's Planet of the Humans
https://www.youtube.com/watch?v=__UJ09PZFoI&feature=emb_rel_end

George Monbiot: From coronavirus to public luxury
https://theecologist.org/2020/jun/11/george-monbiot-coronavirus-public-luxury

Prospectus

The Covid Pandemic and the Black Lives Matter Movement are inflection points in American history and has laid bare our obligation to act and design a more just and equitable world. Design and action are key words. The studio acknowledges the importance of identity and experience that shape our perceptions, but we look collectively outward and are careful not to gaze to deeply into our own navels. If you want to build community, increase your design skills, develop creativity, work as a collective, and make a difference, then this class is for you. We address a broad range of difficult topics, work across a spectrum of media, work digitally but also work with our hands, in an effort to make a difference through design.

This studio supports *alternate modes of thinking and curiosity, and is designed to inspire the imagination*. As Ken Robinson notes, '*creativity is as important as literacy*,' and we will open new conversations for idea development and create a climate of possibility. We all have creative sensibilities, though our standardized educational system has made us fearful of making mistakes. Once fearful, the prospect to make discoveries is diminished. The prospect to make a difference is diminished.

Our studio is a human-centered maker-thinker space built upon curiosity, wonder and play. As a collaborative we draw from the strengths of each student to make positive change through individual creativity and collaborative skill-building. We are interested in making a difference through the creative and social enterprise of design. We remain playfully experimental and socially relevant. In our studio there is the opportunity to work individually or collectively. Projects range from algae bioreactors, issues of nature and technology, tactical urbanism interventions, identifying creative ways to minimize the waste stream, biofabrication, making pollution absorbing systems, to exploration of materials and construction through design-build projects. We dig deep into our topics and therefore we are a research/design/application studio. Again, the point is to build knowledge and skills so we can make a difference.

If architecture can do anything, it can build community.
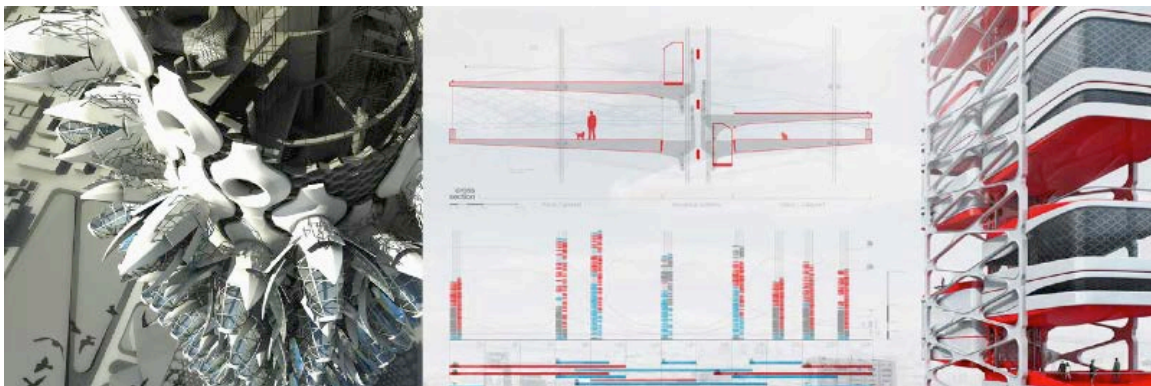
The large - Images from recent Evolo competition entries that propose adaptive approaches to tall buildings.

The term 'Responsive' or 'Adaptive' applies to our work and signifies that architecture can more equitably adjust to human needs and environmental change. This strategy suggests that we conceive of buildings as interconnected and resilient systems. It suggests that the built and natural environments can be more interwoven. *We need ecological thinking.* This 'systems thinking' is foundational to the studio and means that we look at architecture as an integrated social, political, and environmental network rather than a singular entity.

As a yearlong endeavor, we have the prospect to engage others in the thesis. I suggest a number of companion courses to add depth and breadth to your thesis studies. There are many, but I have a list of courses from the school of Liberal Arts, Women and Gender Studies, Engineering, and others depending on the skills needed to address the thesis topic.

It's a loose fit

The structure of the studio is a 'loose-fit' model to enable skill building and design exploration. The studio method takes from firms such as IDEO, Snohetta, and others that look closely at the opportunities afforded by design, materials, construction techniques and knowledge exchange. We support creative thinking and skill development by operating as a collective, continually drawing from the experiences and abilities of those in the studio. In this studio culture, an individual consults with others to advance their own work. I believe I can use my inclinations and experience to help others develop their creative voice, and that nothing can stop and open mind, and in this way, we expand the limits of the possible. Some things common to great teachers that I have had:

- They elevate your expectations of yourself, teach through demonstration, and encourage you to find alternate paths, counter narratives, disruptive technologies, and ideas that are not bound by the status quo.
- They leave us with our own ideas and the provocation to experiment and the desire to learn more – to make a difference.
- They profess that we are not confined by our discipline, but empowered to exchange knowledge across disciplinary boundaries.

These thoughts guide my approach.

We are a collective

Often students in our studio find ways to get their ideas out into the world. Many have placed or won national and international competitions. Some have recorded stories from underserved communities, and questioned privilege and poverty. Some have become entrepreneurs, attended grad school, and contribute to architecture firms that make a difference. All have found ways to make a difference through design.

DESIGN MATTERS. We will explore the artistic, poetic, and pragmatic aspects of our field, and with this spirit, we will develop highly imaginative propositions that impact current societal issues through the medium of architecture.

BUTTERFLY EFFECT. I believe that small things make big differences, that one small incident can have a substantial impact on the future, and that great things start from the bottom up.

So, I look forward to what we will achieve together.

Here's a short story to help you decide if this studio is a good, loose fit.

I came to architecture through commercial fishing and ships carpentry (rebuilding wooden sailboats). From commercial fishing, I learned the benefits of teamwork, especially in adverse weather conditions. From ships carpentry I learned a respect for materials and craft. From sailing and study of nature, I realized there is often a correlation of form and performance that we intuitively recognize, and that everything is connected. These experiences have led me to value the intuitive and emotive processes of design in tandem with more rational methods of thinking.

On the academic side I did very poorly in high school because the subject matter seemed irrelevant. After five years of fishing and carpentry, I studied installation art, industrial design and architecture at Pratt Institute in Brooklyn. At Pratt, I learned to value the visual arts and diversity of thought. These studies led me to graduate work at MIT where I studied design thinking and learned to value the humanity of technology. Most recently, I have directed the CoDe Lab at Carnegie Mellon University where I worked with architects, artists, and computer scientists to explore the poetic, tangible, and social implications of design and technology.

I bring to thesis an interest in creativity drawn from my experiences from working with various disciplines that include the arts, biology, industrial design, and computer science. I also bring a strong interest in design experimentation at 1:1 scale and developing ideas through playful making and testing. As a teacher, I am interested in encouraging curiosity, learning, and innovation. As an architect, I am interested in bringing thoughtful and socially relevant architectural experiments into the world.
If you are interested in this approach to thesis, contact me and/or come visit the studio. dtcliffo@calpoly.edu

S

The small - Ryan Daley on the deck of Bldg 5 with his model for a mobile lab to increase soil health in areas depleted by pesticides.

Why make things interactive and responsive?

American author, marine biologist and conservationist, Rachel Carson stated "the control of nature is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy, when it was supposed that nature exists for the convenience of man." Carson went further and identified the complex, interactive and interdependent network of life and made clear that human action disproportionately impacts the network. The control of nature has been a fundamental underpinning for architecture and engineering and they might well be added to the disciplines in Carson's list. We are now entering a more responsive age of architecture, biology, and computation where the boundaries of our discipline are being redefined.

Advances in computation, technology, and philosophy (among other disciplines) have enabled designers to conceive of a built environment that is in continuous exchange with the local environment. Currently, there is a shift in building design toward systems that adapt to environmental variations such as in humidity, temperature, light, and pollution. Adaptive architectural design varies in its underlying strategies, from the computational and electronic to more passive material-based systems that are reactive to environmental stimuli. An equally important aspect of adaptive architecture is to engage the senses and appeal to the imagination.
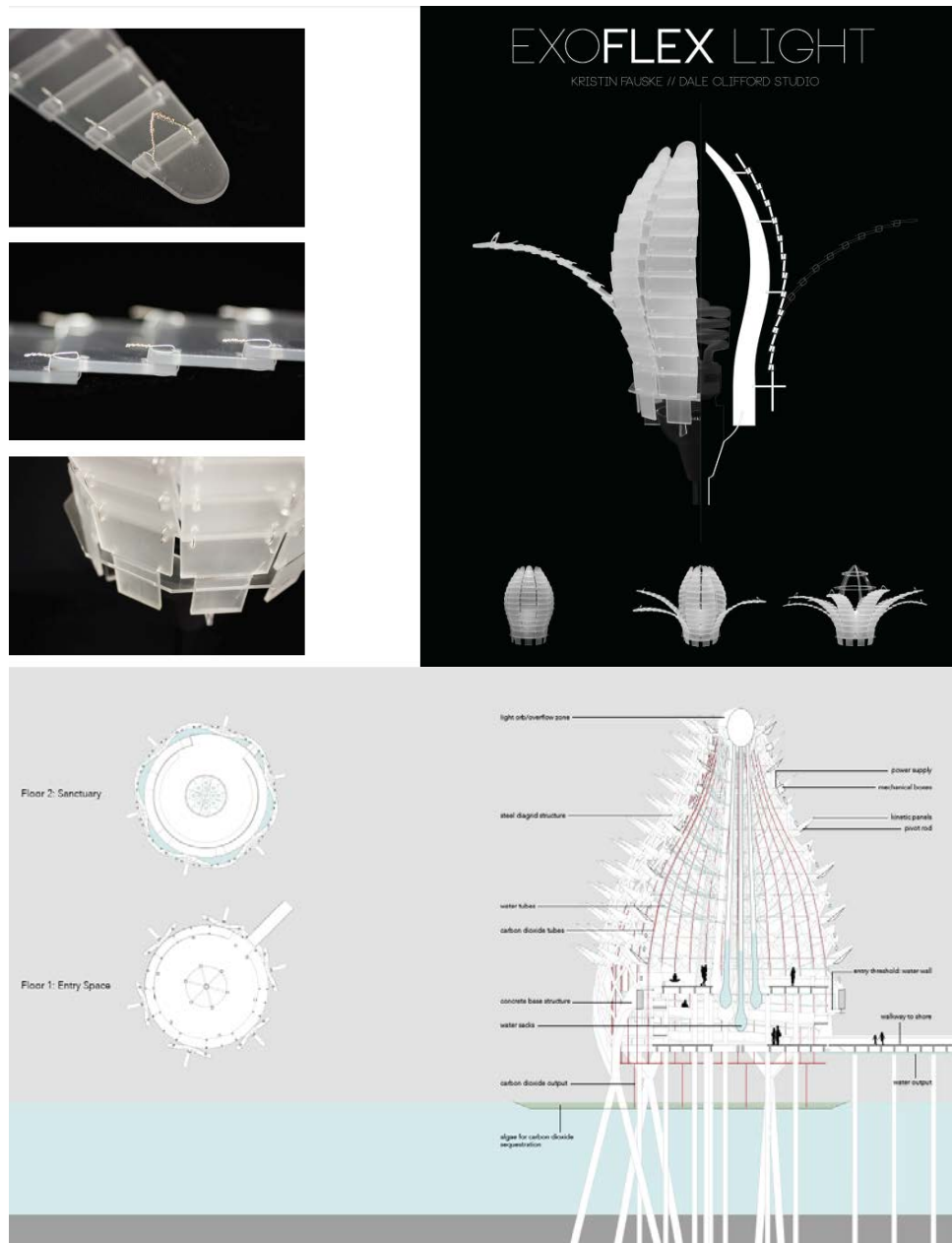
Velum entry that led to design for a water treatment facility, Kristen Fauske, Cal Poly '17. Project began with the study of the strategies succulents use to store water. Work from her thesis was the winning student entry in the Biomimicry Design Challenge. Her team is now competing for the second stage $100,000 prize.

What can nature teach us?

Systems in nature have long been inspiration to architects, designers and artists. Imagine a built environment that disrupts conventional wasteful approaches to design and construction. Imagine a better way to design, a better way to build, and a better way to live. Students in this studio often identify problems implicit in the world, then look to the resiliency of natural systems to guide their work. I am open and supportive of this approach with background experience working with bio-inspired products. Recent students have won both the student prize and the $100,000 business incubator prize from the Biomimicry Global Design Challenge.

(Evolo competition) and Strandbeast by Theo Jenson. Jenson's project illustrated a low-tech approach to a project that interacts with wind. The system harvests and stores wind energy, then moving when the energy is released.

On creativity and the culture of open source exchange

Creativity, as outlined by the MacArthur Foundation, is regarded as the human endeavor where individuals and teams gain new insight by connecting the seemingly unconnected in significant ways. Creativity is built upon risk-taking and a playful and experimental attitude - which requires confidence and trust. As in the most creative and effectual design practices, our studio will construct a culture of experimentation and knowledge exchange. The studio is considered open-source, where ideas are freely exchanged and the momentum of the group benefits the individual.

These thoughts are structured on professional models I have experienced in multidisciplinary practice, specifically Molecular Geodesics (biotech) and IDEO (industrial design). These companies that supported design-thinking skills in open-source, non-hierarchical working environments, effectively giving voice to young designers while positioning them next to experts. Key to creative development in these companies was working with motivated and knowledgeable people and the free exchange of ideas.

The Fine Print: The teaching method is not prescriptive. This means you are curious and motivated to think for yourselves, to think your way into, and out of, a problem, and to invest time and energy to creatively address your thesis to the best of your ability. This may cause discomfort, as you will be supported but not be told precisely what to do. The teaching | learning method is intended as a 'loose fit' model that is fluid and adaptable to new scenarios as they develop.

FAQ's

The questions below are intended to help you make decisions regarding choice of studio and reflect questions I have received from students.

Who else is involved in this studio?
- That's up to us. In previous thesis courses, students have assembled committees that include experts from architecture and other fields. For instance, you may form a committee that includes a team from architecture, a storyteller, and biologist. If interested, I will help form committees that increase the depth and quality of your work. Often these experiences lead to future collaborations.

How is responsive architecture defined in this course?
- Responsive architecture is adaptive to humans, animals, environmental stimuli, social dynamics and other triggers. This definition is inclusive of both high and low tech studies, it is inclusive of both static and dynamic solutions, and it is inclusive of ephemeral and more durable speculations.

Can I construct my project at full-scale?
- Yes
- I have started a Design|Build course that may be taken in parallel to Thesis.

Do I have to construct my project at full-scale?
- No, though I do ask that you learn from your models and that they 'work' in some way, meaning that you gain useful feedback from them.

What's construction got to do with it?
- I am a strong proponent of developing ideas though making 1:1 scale design experiments. I believe that creativity often stems from immersion in a problem and from the equitable engagement of hand and mind.
- Thinking through the fingertips. I believe that ideas are often generated from physical engagement – in our field, that is the act of making, of constructing, of bringing into existence. Often during this process, possibilities are uncovered and ideas formed.

I want to make a difference. Can I apply my interests to the real world?
- Yes. You may apply your work to current socially relevant issues. I only ask that your process is creative and rigorous.

OK, what about project ideas. What kinds of projects are ok?
- Most any project, as long as it is undertaken with rigor, proceeds experimentally, is compelling, and is responsive in some way.
- So there are lots of possibilities!

I'd rather work with straight lines as opposed to curves. OK?
- Sure is. Some of our best buildings are derived from orthogonal relationships.

I'm into soft robotics. Can I use an arduino? How about grasshopper and maybe some genetic algorithms?
- Yes, but not required. I ask that students explore their ideas rigorously. This may include analogue or digital means, high-tech and/or low-tech explorations. We consider technology broadly, creatively, and intelligently.

Can I design more temporary, ephemeral systems, or does my project need to be more permanent?
- Design contributes to society in many ways. Some projects may last a mere instant while others may be highly durable. I ask that you consider the nature of materials and construction, regardless of permanence. *For example, In the last lab I directed at Carnegie Mellon, a student installed color-coded air pollution sensors on kites and traveled to Beijing and flew them with a crowd of people. Her activist interests put power in the hands of an urban population by publicly demonstrating air quality with a*

traditional activity (kite flying). The citizen readings were at odds with government air quality reports. This type of project could imaginatively lead to architectural application.

Will this course set me up to enter practice?
- Yes. Exceptional design firms have been impressed with the high quality, thoughtful and socially relevant work that we produce. They also are interested in the ethic of teamwork and skill swapping found in this studio.

Will this course set me up for graduate work?
- Yes. The coursework supports an ethic of discovery through design research, qualities that will support a strong graduate school portfolio.

Is this class 'tech-heavy?'
- No, not unless that is your interest. Architecture is highly intertwined with technology and we will explore its creative side - and how it can lead to new ways of thinking, building, or connecting us with nature. We also put emphasis on skill-swapping so students learn from each other and develop interests and expertise. In this way, we get help when we need it and are more likely to playfully experiment and make discoveries.

Will this class require a lot of work?
- Yes. If you want to make a difference, we need to do more than what is expected of us.

Will this class be a lot of fun?
- Yes. The course is built on playful design experimentation, taking risks, and intellectual, emotive, and design growth.

Want to make a difference?

IAAC   *MacKay Lyons Ghost 6*

"In an increasingly globalized world it's nice to reaffirm a way of making architecture about place – its landscape, climate and material culture." MacKay Lyons, Ghost Studio, Experiments in Wood Framing. I find these projects inspiring for their nuanced approach to the tradition of wood framing. The projects challenge one to reconceive the way we use 'off-the-shelf' building products. So, with a given amount of relatively low-cost material, how might you challenge the way we build?

481 Studio Description_ F|W|S

The studio "engages the development and employment of a design project (most often - but not limited to - a building proposal) that demonstrates the findings, proposals, and challenges resulting from the thesis inquiry. In essence, the studio consists of a hypothetical, built demonstration of the thesis inquiry." The above is a concise description from Prof. Jonathon Foote.

481 supports open-ended architectural research and is structured as a collaborative design laboratory. Projects may be developed individually or collectively, in ether case, the studio will act as a design collaborative that supports the free exchange of ideas. As a studio we focus on developing creative thought processes with application to current societal needs. The umbrella topic is 'Responsive Architecture' and posits that a more resilient approach to design will better serve humanity. Under this umbrella, we develop thoughtful and radical interventions in environmental contexts, be they densely urban conditions, post industrial cities, or other areas that could benefit from exploratory design thinking.

At the intersection of architecture, ecology and related disciplines, the coursework draws from the creative application of vernacular and emergent building approaches. Site, environment, infrastructure, culture, morphology, materials and fabrication process are key drivers for project development.

The images above are examples of common materials used in uncommon ways. To me, these are both creative research projects based in an interest in materials research construction technology.