

Studio 401 NOTE

This studio supports alternate modes of media, thinking, and curiosity, and is ***designed to inspire the imagination***. As Ken Robinson notes, 'creativity is as important as literacy,' and in this spirit we will open new conversations for idea development and create a climate of possibility.

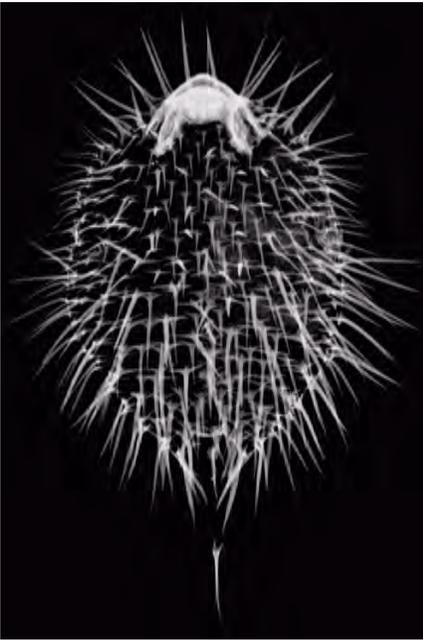
We all have creative sensibilities, though our educational system has often made us fearful of making mistakes. Once fearful, the prospect to make discoveries is diminished.

In this studio, we will strive to remain playfully experimental and socially relevant.



'creativity is as important as literacy'

Ken Robinson



Projects occur at the intersection of architecture and ecology

Studio: How it works

Creativity

Collaboration

Alternative modes of media

Studio 401

As a studio, we develop 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.

About. The studio supports thought-provoking and **open-ended architectural research**. Structured as a collaborative design laboratory, the studio draws from the strengths of each student to make positive change through individual creativity and collaborative skill-building. We explore ideas through a range of media, from storytelling, hand drawing, computational techniques, and a wide range of modeling.

Projects topics are broad and may be developed individually or collectively, in either case, the studio will act as a **design collaborative that supports the free exchange of ideas**. Topics range from nature/technology, issues of the biodiversity of oceans and other ecosystems, material studies, creative ways to minimize the waste stream, pollution absorbing systems, study of the effects of color and space on the human psyche – to many other topics of interest. Projects range from small-scale material studies, to 1:1 built ideas, to large-scale urban infrastructure.

Projects are linked by the idea that buildings (and the profession of architecture) are no longer static entities, they are responsive and resilient networks that **interface with the local environment, natural or urban**.

Our studio is a human-centered maker-thinker space built upon curiosity, wonder and play. As a studio, we are interested in making a difference through the creative and social enterprise of design. The term 'Responsive' or 'Adaptive' applies to our work and signifies that **architecture can better adjust to human needs and environmental change**. This topic is quite open and suggests that we conceive of buildings as interconnected and resilient systems and that the built and natural environments can be more interwoven.

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, Allied Works and others that look closely at the opportunities afforded by design, materials, construction techniques and knowledge exchange. As a studio 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, individuals consult with others to advance their own work.

Often students in this studio find ways to **get their ideas out into the world** and many have placed or won national and international competitions, collected stories from undeserved communities, became entrepreneurs, questioned privilege and poverty, attended grad school, and contribute to high quality architecture firms.

They have found ways to make a difference through design.

Key Course Points

CURIOSITY. Instructors bring to thesis an interest in creativity drawn from their experiences from working with diverse disciplines that include the arts, biology, industrial design, and computer science. In 401 there is a strong interest in **design experimentation** at 1:1 scale and developing ideas through playful making and testing. The course encourages curiosity, learning, and innovation. The studio is interested in bringing thoughtful and socially relevant architectural experiments into the world.

DESIGN MATTERS. During thesis, we will apply your thoughts and skills to positively effect people's lives through design. 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. Small things make big differences and that great things start from the bottom up. So, I look forward to what we will achieve together.

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



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.

You will be challenged to think differently:

**about design;
about your contribution;
about yourself**



R. Johnson Thesis 2018_ Adding value to materials reclaimed from the waste stream.

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.**

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.

On creativity and the culture of open source exchange

Creativity (as outlined by the MacArthur Foundation) is regarded 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.

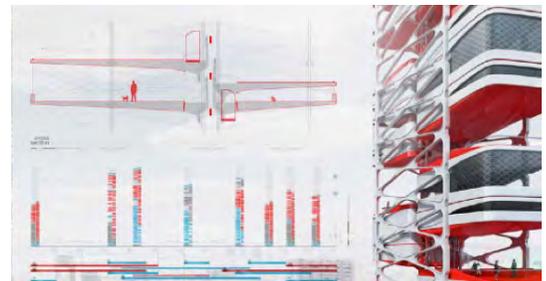
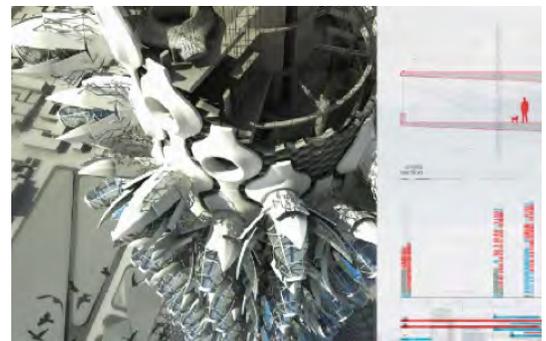
These thoughts are structured on professional models I have experienced in multidisciplinary practice, specifically Molecular Geodesics (biotech) and IDEO (industrial design). These companies that supported design-thinking skills in open-source, non-hierarchical working environments, effectively giving 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 control of nature has been a fundamental underpinning for architecture and engineering- **Got a better idea?**

he does



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. THESIS 2018



The large - Images from recent Evolo competitions that propose **adaptive approaches to tall buildings.**



FAQ

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

Why do you teach? I believe I can use my inclinations and experience to *help others develop their creative voice*. Accordingly, I have high standards and expectations such that I can help students to realize their potential.

Some things common to great teachers that I have had:

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

How is responsive architecture defined in this course?

Responsive architecture is adaptive to humans, animals, environmental stimuli, or other triggers. This definition is inclusive of both high and low tech studies, of both static and dynamic solutions, and inclusive of ephemeral and more durable speculations.

Can I construct my project at full-scale?

Yes

I have recently started a DesignBuild course that may be taken in parallel to Thesis.

Do I have to construct my project at full-scale?

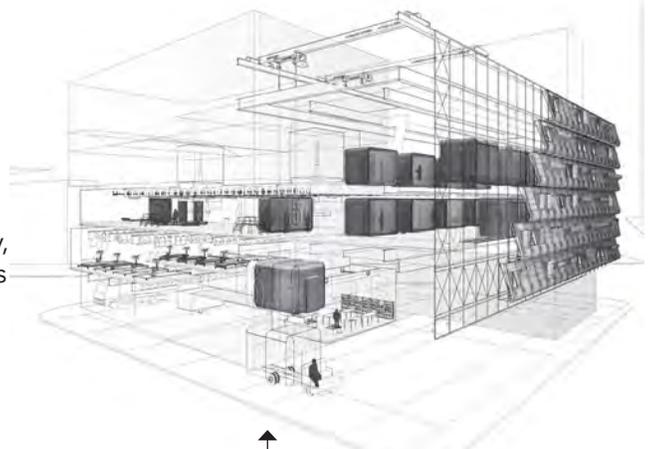
No, though I do ask that you learn from your models and that they 'work' in some way, meaning that you gain feedback from them.

What's making got to do with it?

I believe that creativity often stems from immersion in a problem and from the equitable engagement of hand and mind. I believe that ideas are often generated from physical interaction – 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.

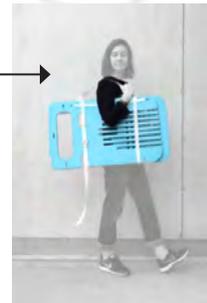
I want to make a difference. Can I apply my interests to the real world?

Yes. You may apply your work to current socially relevant issues. I only ask that your process is creative and rigorous. For instance, one might partner with a graduate student in the field of rural water policy and develop an innovative strategy architectural solution that engages the problem of water harvesting, storage, and distribution – all while consider the local technological and social context.



K. BROMLEY
Thesis 2018

Skills Developed
-community activism
-rhino/grasshopper
-graphic presentation
-analogue and digital shop tools



Deployable Chair : INDIVIDUAL SCALE INVESTIGATION IN TEMPORARY PLACE MAKING

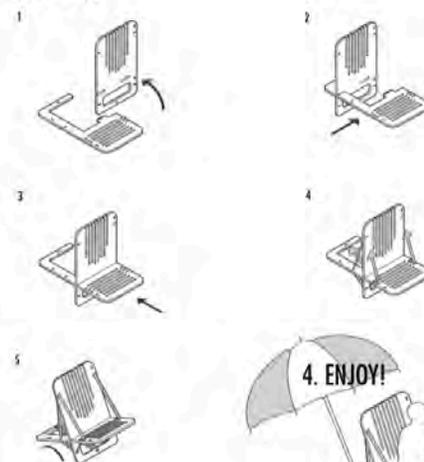
1. MAKE



2. TRAVEL

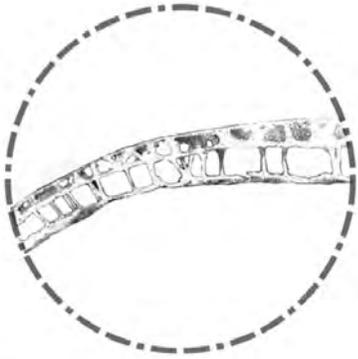


3. DEPLOY



4. ENJOY!



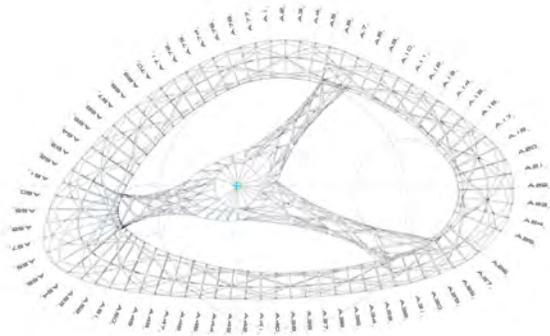


Properties



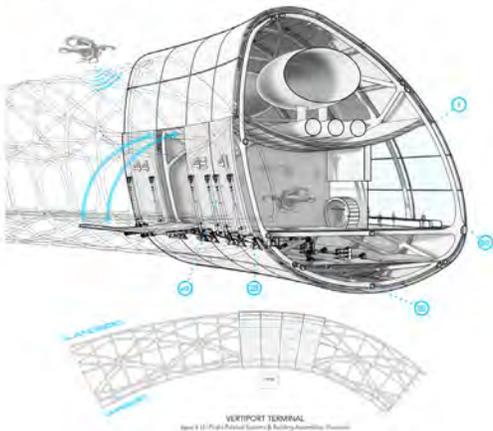
Nature studies

+ 004 Thesis Project
Building Technologies



Vertiport_ Urban Infrastructure

+ 004 Thesis Project
Building Technologies



Wayon Ng
Thesis 2018

FAQ continued

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!

That's up to us. In previous thesis courses, students have assembled committees that include experts from architecture and other fields. If interested, I will help form committees that increase the depth and quality of your current work and potentially lead to future collaborations.

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. In a project in the last lab I directed, 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). This type of project could imaginatively lead to architectural application.

Will this course set me up to enter practice? Yes.

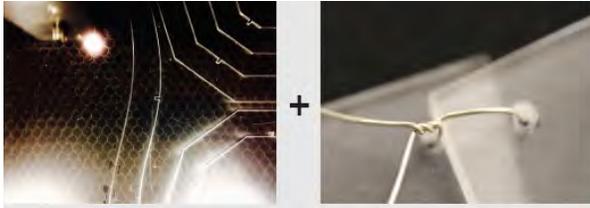
Exceptional design firms have been impressed with the high quality, thoughtful and socially relevant work that we produce. They also are interested in the ethic of teamwork and skill swapping found in this studio.

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. Previous students have been accepted to MIT, Columbia, Harvard, and lots of other places.

Is this class 'tech-heavy?' No. 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 be a lot of fun? Yes. The course is built on playful design experimentation, taking risks, and intellectual, emotive, and design growth.



The idea of flexibility created from rigid parts and a repetitive process of detailed hand work is manifested in the EXOFlex Light, created solely from mechanical and friction-fit connections visible in the interior skeleton and exterior flexible panels

Material Studies_ Vellum



Kristen Fauske
Thesis 2018

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 either 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 spectrum in thesis studio is broad and may include traditional means of adaptation (operable components such as doors, windows, roofs and walls) or more radical and speculative means of adaptation (emergent materials and technology transfer from other fields). It is likely that your project will engage design at a range of scales: component, building systems, urban systems, and ecological systems – and at some point in the design process, we will resolve projects to a high level of detail. The studio will draw from the arts and the sciences, and from the topical areas below.

Social relevancy

From administrative policy to small changes that make a big difference in people's lives through design. The studio is concerned with making change.

Materials research

Rethinking traditional materials of the study of emergent materials that give architecture the prospect to exist in varied conditions. For instance, previous projects have studied methane capture for construction on disrupted biotopes such as landfills. Karli Montick's thesis proposes design solutions to the proliferation of micro-plastics in the oceans.

Construction technology

In-depth study of methods of assembly. These may include study of traditional framing systems (Ghost Studio) or the craft of wooden boat building - or more advanced and speculative methods of construction including technology transfer from the automotive industry, aeronautics, or composite Americas Cup sailing technology. The field is open. The projects to the right by Sarah Chong and Havel Weidner respectively look to water collection in extreme environments and the architectural potentials of wood bending.

Systems thinking | Learning from nature

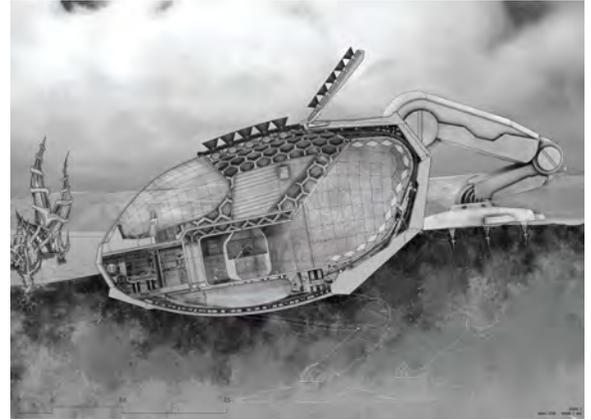
This area is of interest to better understand the porous boundaries between living and non-living systems and to view nature as a model network of interactive systems, and to observe that animals and plants have evolved a large variety of reliable and relatively simple mechanisms to adapt to environmental fluctuation.

The overlap of disciplines

Study of a field that may bring new prospects to architecture. The field is up to you and could vary from bicycle mechanics to biology to the arts.

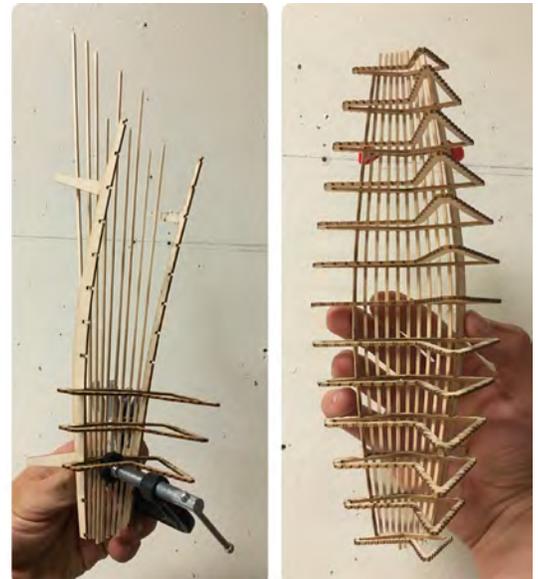
Schedule

Fall	Research Design Experiments Creativity Workshops Schematic Design [Abstract Show] [Velum]
Winter	Design Development Creativity Workshops Book Show Installation [Section Show] [Qualifying Review]
Spring	Design Refinement [Detail Show] [Studio Show] [Chumash Show]



Sarah Chong
Thesis 2019

Uncharted



Havel Weidner
Vellum 2018



492 Seminar Description_ Fall

During the seminar, thoughts are both informed and improvisational. The conversation is exploratory and connections are made often leading to new insight. Through listening, making meaning, and finding common ground we will work toward shared understanding rather than trying to prove a particular argument. The focus of the seminar is to develop a shared understanding of a text.

This is helpful!

The thesis is distinct from the thesis project, which will be developed in studio. The thesis is a body of research that you will likely work on for many years. The thesis project is a design test case of the thesis. Don't worry, the thesis will (and should) change as the project is being developed. In many cases, the thesis emerges from the project. More to come on this, but remember, often the best ideas begin simply, then are developed through design work in the studio. So complexity arises from simple beginnings.

During the seminar, we will identify thesis topics, their historic underpinnings, and their currency in the field of architecture. We will identify core knowledge within our own field and look to advancements in adjacent fields (the arts, music, engineering, botany, materials science, . . .).

Seminar is dedicated to:

- 1) developing flexible, self-directed curricula for the thesis year;
- 2) identifying interests and **developing a body of research**; and
- 3) writing of the thesis proposal.

Seminar meets for discussion once a week with students leading the discussion. In-class time is dedicated to discussions and the development of ideas. Out of class time will largely dedicated to reading, writing, and preparing for student led discussions.

“There are no passengers on spaceship earth. We are all crew.”

Marshall McLuhan

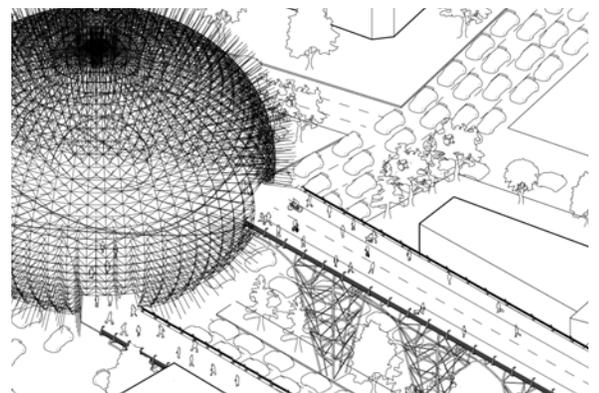


Eric Yaroush

Thesis 2018



Is that hot glue?



Saul Flores_ Pollutant Collection Infrastructure in Mexico City

Thesis 2018

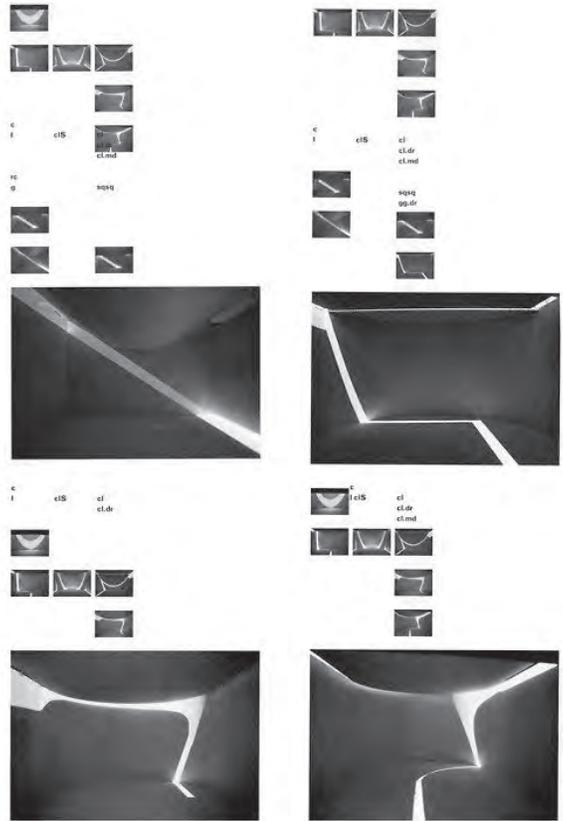
Meet the team

DALE CLIFFORD will be teaching Winter/Spring terms. I came to architecture through commercial fishing and ships carpentry (working on wooden sailboats). 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 we understand this relationship prior to forming rational thought. This observation has led me to value the intuitive and emotive processes of design in tandem with more rational methods.

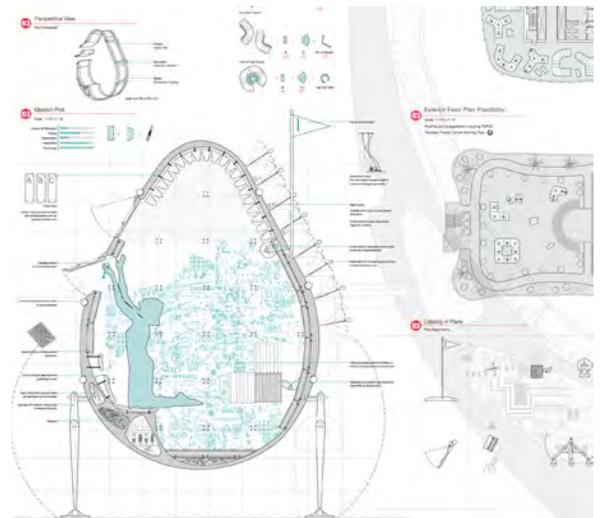
On the academic side I studied installation art, industrial design and architecture at Pratt Institute in Brooklyn. At Pratt, I learned to value the visual arts and diversity of thought. These studies led me to graduate work at MIT where I studied design thinking and learned to value the humanity of 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.

KELLE BROOKS will be collaborating to team teach (yay!) this course and will be teaching in the Fall term. My views that the natural and built environments can be better integrated, have been shaped by my study of the sensorial aspects of painting, installation art, and architecture. My professional practice integrates scales and disciplines (small: materials and finishes, human scale experiences large: buildings, landscape architecture and planning.) Currently I am researching the influence of the natural environment on the human psyche, specifically on the design of learning environments for K-12 schools.

Interested? Contact Dale or stop by the studio.
dtcliffo@calpoly.edu



Light study by Stephen Holl showing the sensorial feedback gained from testing physical models. This process is recursive and may be done physically, digitally, or by hybrid techniques. **This is a form of design research!**



Erin Morrato, The Rise of the [Semi] Nomadic Worker Thesis 2019

Application of design research.