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In addition to the well-known Central Library building designed by Bertram Goodhue in the 1920s in downtown Los Angeles, the Los Angeles Public Library system has also constructed some 100 branch libraries between 1912 and the present. Thirty-nine of these were constructed between 1912 and 1930. Due to the Depression and World War II, only seven new branch buildings were constructed during the following three decades. While many of these have been demolished, a good number of them have recently been rehabilitated and expanded. A $6.4 million bond measure in 1957 made possible the construction of 28 additional branches over the following decade, and three subsequent bond issues, in 1989, 1998, and 2011, paved the way for one of the most ambitious library construction programs undertaken in this country. As a result the Los Angeles Public Library now operates 73 branch libraries around the city. I have just completed a book on the central building and I would now like to extend my research to the branch building system. I have completed research on the pre-WWII buildings, but would like assistance researching and documenting the post WWII structures. This project will include internet and archival research, and also require visits to and the documentation of many of these structures. This research will result in a book or extended article.

A list of buildings and thumbnail images can be found at http://www.lapl.org/branches
2017 Graduate Research Scholar Abstract

Faculty: Maria Esnaola. esnaola@usc.edu
Co-founder/partner, KnitKnot Architecture: www.knitknotarchitecture.com

Title: From prototype to type: a building-manual for collaborative design

1. Background to the project

Leon Battista Alberti introduced the separation between builder and architect in 1452, thereby effectively severing the process of production or making from the intellectual process. In recent years, however, the proliferation of the “design collective” as a format for architectural association and practice has challenged the notion of the architect as “a thinker” and brought it closer to that of “a maker”. Groups of younger architects have coalesced, often triggered by a context of deep economic and social crisis, to create a more open, inclusive, and flexible city, based on architectural projects that are ad hoc, handmade, built (and even financed) by users/volunteers, and fundamentally based in participatory design processes. Moving away from architecture's traditional focus on the look and construction of “capital A” architecture, the project will explore ways to redress the balance of power between the architect and the user in the making of performative spaces.

The proposed research will be a continuation to a two-year project started by the collaboration between KnitKnot architecture, the community of El Jicarito in Nicaragua and the NGO Seeds of Learning, which has materialized in the design of a school, currently undergoing construction. The project in el Jicarito proposed a shift from a passive learning experience to an active and creative learning process, through the idea of LEARNING FROM – BY MAKING. This meant involving the community in the learning of different constructive techniques and building processes by actively engaging with the activity of building their own school via collaborative work. By working with otherwise valueless materials (earth, agriculture bags, demolition waste) and engaging the community in all stages of design (program, site, decision making, construction) we aim to create a performative space. This is a design approach that is less about creating a finished object than it is about the series of actions by which a space is designed, built and inhabited.

In conclusion, Learning from – by making is understood as a way to empower people to self-initiate and implement their own projects in the future, by applying the knowledge they have acquired during the construction of the school. The research title ‘From prototype to type’ encapsulates this idea. The project will find new potentials in the subversive translation from Prototype to type. Type, understood as “a representation of an element which ought to serve as a rule for the model ‘ (3) should precede the materialization of the prototype. However, the present scope of the project is, instead, based on looking at the model (the prototype: the earthbag) in order to derive new types (prosthesis for facades and homes, backyards, roofs, public spaces).

To sum up, the research will propose ways to engage the community in the future planning and construction of new urban types to be built and eventually, replicated by the users, taking the school prototype as a departure point.

2. Research Objectives

a. To understand some of the mechanism, strategies and tools underpinning current practices of participatory design. As a way to approach this issue, a series of case studies of architectural collectives working in different countries will be selected, categorized, examined and documented. Examples of these collectives include Assemble (UK), Paisaje Transversal, Lacol, Recetas Urbanas (Spain), etc. Furthermore, the student will have the opportunity to actively engage with some of the collaborative projects currently developed by knitknot architecture, namely ‘El Jicarito school’ and Governors Island Pavilion in NY(1)

b. To create a graphic catalogue of potential urban interventions for the community of el Jicarito in Nicaragua. Understand how a ‘built prototype’ (i.e. El Jicarito school) could trigger the creation of innovative types (i.e. housing, kitchen, storage, etc.) by pushing the boundaries of the knowledge of a specific material and techniques involved in the production process (i.e. earth-bags). This will be addressed through collaborative design process, workshops, consultations and incremental plans for urban development. The catalogue will be formulated under the following principles:
- Learning from by making: self-build as a form of participatory design as well as pedagogical technique.
- From prototype to type as a move towards flexible layouts that could adapt to users needs, including methods to involve future users in the design process, using workshops, consultations and through growth plans: urban/typological.

c. **To request the inclusion of the earthbag technique in the NTON (Norma Técnica Obligatoria Nicaraguense)**, Nicaragua’s housing laws and building code that sets of regulations governing the design, construction, alteration and maintenance of structures in the region.

3. **Relevance to the school**

Conceived at the moment when thinking and doing are often disastrously divorced, the present research project may well contain a hint for their new reconciliation. Looking back a Semper’s ideals of unification and in an attempt to convey that, in the very origins, the invention of spatial organizations are intimately connected with technique, and that this unity is achieved first in the making (advocating a return to the situation existing at the time of the Greeks when *techne* and *episteme*, making and thinking, had not been yet separated).

4. **Mentoring and opportunity**

a. Getting your “hands dirty”: The study of the earthbag system will oscillate between the physical prototyping and the representation of the constructive technique. The student will be encouraged to physically participate in the construction of the above-mentioned projects (El Jicarito School and Governors Island Pavilion) to better understand the materiality and opportunities of the technique.

b. Learning collaborative methods of production: Technical (working with engineers), economical (getting involved in crowd-funding campaigns), communal (working in close proximity with the people in the community of El Jicarito), institutional (planning with the NGO, Seeds of Learning), and design-oriented (working not only with your main advisor, Maria Esnaola, weekly; but also with the larger team of architects, researchers and academics that comprise KnitKnot).

c. Making things happen: The result of the research will be a plan for the collaborative growth of a real community in Nicaragua, el Jicarito. The project will find continuity in designing, financing and ultimately, building some of the proposed typologies. The project poses an opportunity to engage the field from a more active and participatory perspective.

d. Inventing means of translation between architect-user: The student will be exposed to innovative ways of thinking about representation and it’s capacity to engage diverse audiences. We will test our abilities to challenge what we do best, drawing, and use it as a tool for communication with the community.

5. **Deliverables and Funding Sources**

**Deliverables**

*Spring 2017*

a. **Construction Manual for the earthbag technique.** The student will be involved in the construction of the Jicarito School and the pavilion in Governors Island in order to get acquainted with the techniques and the formal capacities of the earthbag. The study will materialize in a visual catalogue to propose new formal and organizational layouts with the technique as well as the development of a visual vocabulary to engage users not familiarized with the architectural language.

*Consultants: Calearth Institute. CA/ Precision Structural Engineering. OR/ Seeds of Learning, Nicaragua*
b. **Case study and research of participatory projects.** This will be a support document and archive for the latter manual.

*Case studies:* Assemble Studio. UK/ Ant Farm. USA/ Ecosistema Urbano. Spain/ Metxea. Spain/ Fake Industries. Australia/ lacol. Spain/ Office for Political Innovation. USA/ Recetas Urbanas. Spain [the present list will be expanded/refined during research].

*Fall 2017*

c. **Building-manual for urban renewal in El Jicarito.** A graphic catalog for potential new typologies in the community. The catalog will serve as a guideline for incremental plans for urban developments in the region.

**Funding sources:**

The school in el Jicarito was successfully funded by a crowd funding campaign that raised USD 22,200 (2) and the economic support of Seed of Learning. In future projects and implementations of the proposed urban interventions, the project will follow the same systems for fundraising and partnerships.

**Skills required:**

Strong graphic and visual skills (3D modeling software: Rhino, Autocad, Revit (preferably) / Adobe Creative Suite); energy and self- initiative to get involve in the decision making and generation of ideas as one more member of a collective; compromise and engagement with the architectural practice understood as an agent for social change.

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(1) KnitKnot’s proposal for the AIANY FIGMENT/ENYA/SEAoNY City of Dreams Pavilion Competition has been shortlisted for resubmission. If won, the pavilion will be built during the Sumer of 2017 and will serve as a stage for citizen intervention and participation, as well as a further experimentation with the proposed construction technique to be explored in the present research

(2) [https://www.indiegogo.com/projects/el-jicarito-school-community-architecture#/] (3) Quatremere de Quincy (Dictionnaire d'architecture, 1825)
Designing the Landscape of Sociocultural Action: Ritual, Performance, Practice

Alison B. Hirsch, MLA, PhD
Assistant Professor in Landscape Architecture + Urbanism: http://arch.usc.edu/faculty/hirsch
Co-founder+Partner, foreground design agency: www.foreground-da.com

Role: Hirsch, Principal Investigator; GRS, Research Assistant

Description:
The GRS will contribute to a forthcoming book on landscape architectural theory and design methods. The book emphasizes existing sociocultural dynamics as a catalyst for physical design, challenging common conceptions that participatory or socially-oriented design processes must sacrifice the spatial, material and formal qualities of the (landscape) architectural project. Landscape is a durational and dynamic medium, thus landscape architects are uniquely trained to work productively with action and change – ecological and social, yet the field has long prioritized the former. This book begins to flesh out the latter in disciplinary discourse – enriching the field’s scope and challenging some of its accepted canons. The book provides both critical reflection on recent landscape architectural projects and proposes new design methods through a series of hypothetical proposals.

Project Product:
This research will contribute to the development and production of the book, Designing the Landscape of Sociocultural Action. Proper credit will be granted the GRS within the publication.

Expected GRS Deliverables:
GRS duties will involve (1) identifying sites that are host to particular cultural practices and sociospatial conflicts in Los Angeles via media coverage and on-the-ground investigation and documentation (photography and mapping); (2) generating a case study index/bibliography of techniques, methodologies, designed sites and writings that deal with visual ethnography and design; (3) generating an annotated index of international design projects and practices that integrate creative participatory or ethnographic design techniques; (4) possibly generating or refining drawings/mappings for book figures.

Skills Needed:
Strong investigative research skills, an understanding of responsible and thorough scholarship (generating bibliographies and proper citations), strong representation skills (Adobe Creative Suite; GIS preferable); and an interest in cultural landscapes and the public realm.

Additional Funding:
$21,200 James H. Zumberge Research and Innovation Fund grant awarded the project for book development and production.
Introduction to the Big Picture
One of the potentially most promising areas for research in architecture is the examination of healthcare related themes. USC has committed to this (especially under the issue of “aging”) as one of provost's five "wicked problem" themes. In doing so, USC is encouraging multidisciplinary teams to be assembled that can dissect the issue and suggest multi-school approaches that address these complex problems. By establishing working relationships between disciplines of architecture, civil and environmental engineering, health science, spatial sciences, public policy, social work, and computation engineering, one could link knowledge and expertise systematically among disciplines to effectively research and addresses the complex relationships between buildings, technical systems, infrastructure, resource consumption, and end-user outcomes to better-inform decision making. These different world-views, when focused on human health outcomes, can lead to innovative solutions that affect well-being, and work productivity.

At the same time, the ACSA has announced an initiative that seeks to encourage more of its member schools to consider healthcare architecture as a research theme. Recently, a joint-program framework emerged to create “a peer network of leading researchers and foster the concurrent use of vocabularies from health and design to catalyze demand for healthy places and, ultimately, to transform communities”. This Design & Health Research Consortium unites the Architect’s Foundation, the AIA, and the ACSA in this endeavor. This proposal could also help assess the viability, desire, and impact of the School of Architecture joining this consortium.

There is also currently a move underway to increase the number of healthcare related programs in north American Schools of Architecture from less than ten to as many as 20 programs. Many of the existing programs are from smaller universities that operate without the benefit of a medical school, preventive (public) health program or health policy sciences school. USC has all three of these resources in addition to strengths in clinical research, bio-medical, and artificial intelligence.

Project Possibilities and Objectives
There is great potential for Architecture to partner in these research efforts, but first we must discover the overlaps of ideas and methods for collaborative projects. Schools such as Keck, Price, Verterbi, Social Work, Gerontology, and Dornsife can benefit from our ability to imagine neighborhood settings, office buildings, laboratories, residential dwellings, and hospitals that enlist the strengths and problem solving capabilities of architecture. For example, landscape and architecture design can promote more active choices for youth. This could tie in with research by Keck and Virterbi professors monitoring individual activity to prevent obesity (see https://news.usc.edu/13569/usc-researchers-to-present-new-strategies-to-prevent-childhood-obesity/). Through lack of knowledge, USC Architecture is unaware of opportunities to be involved in collaborative research.

This proposed project (“Healthcare Design: the Identification, Prioritization, and Analysis of Potential Research Topics”) has five components: a literature review and interviews, identification of USC partners, interviewing key professional partners, research organizations, and assessment of current programs across the US.

1) Literature review
The project will start with a thorough analysis of the most promising possible research possibilities. This review will seek to derive from a varied literature search some of the most likely areas for research investigation. Review articles and books that outline the emerging and traditional topics and research questions will be identified and a narrative will be written to describe the possibilities that exist for the development of a research program.
A very cursory (two minutes) literature review uncovered healthcare research topics that are well within the expertise of our own faculty:


2) Practicing professionals and research organizations in Southern California
There are dozens of architectural practices in southern California that have an interest in healthcare facility design, as well as research think tanks like RAND. Many of these have their own 501C3 research centers that conduct research projects initiated by clients or by the firms/organizations themselves. Several are frequent contributors to research journals. Even competing campuses like UCLA and UC Irvine could be potential collaborators with USC Architecture because they have few willing collaboration partners on their own campus. Interviewing individuals and assessing organizational capabilities could also identify potential collaborators. Ten+ interviews are expected to be conducted with architecture professionals in leading firms that have an emphasis in healthcare design.

3) Identification and inventorying of USC Partners
Much discussion has taken place about how healthcare can be more broadly examined on the campus through the lens of each professional/academic program. Clearly content-rich interviews with representatives from Price (Health Sciences), Verterbi, Gerontology, Social Work, Occupational Therapy, and Preventive Medicine will begin to plot the territory and topics, which have been incubated in selected academic programs. A top down approach will seek to first outline themes and later particular faculty with shared interests. In addition, there are groups on campus that should be explored in more depth such as the USC Institute for Integrative Health (http://integrativehealth.usc.edu/research-funding.html)

4) Programs of competing schools of architecture in North America
Knowing what other schools have done in this domain is of particular interest. It can help to identify promising research areas as well as suggest collaborative possibilities. Many programs appear to be quite diverse (UTA, Texas A+M, Clemson, University of Illinois – Chicago, University of Kansas, Arizona State University, a new program at University of Washington, and Wisconsin – Milwaukee where design for dementia is a specialty). Some have research programs that have existed for decades while others are relative newcomers. The topics, the collaborative partners, government funding sources, and foundations that support research are all of interest.
USC Architecture Faculty
There are core groups of faculty who have an interest in this topic or have on-going research projects that can fit within this domain. They include Joon Ho Choi, Karen Kensek, Lauren Matchison, Kyle Konis, Travis Longcore, and Victor Regnier. Other faculty have also expressed an interest in being involved if a healthcare research group is initiated. Student research through the MBS program has often touched on health care themes. Although not exclusive, the MBS area might be a potentially good place for a center to be housed especially in the start-up phase.

Research objectives of this specific proposal
The major research objective is to take the next step in establishing the School of Architecture as a leader at the intersection of architecture and health through the development of new research agendas within the School. A secondary spin-off would be studying the feasibility of a new interdisciplinary minor and a new certificate program in architecture, health, and wellbeing that can link to the research.

Funding Sources
Currently the project has no direct funding as it is a new initiative. The proposal intends to jumpstart a grant at the university for new collaborations (USC Research Collaboration Fund award) and then encourage active funded collaborations with major design firms with expertise in this area.

Deliverables
The final deliverable will be a report that explores initiatives that the School of Architecture can take to become a leader in the field.

Request
Given the scope of this proposal, we would like to request consideration for more than one Graduate Research Scholar.

End Notes
LEFT: “When the terms ‘wellness,’ ‘LEED,’ and ‘sustainability’ are all added to a Google Trend graph, “wellness” is googled far more often than both ‘LEED’ and ‘sustainability.’ The is no doubt that the concern for healthy environments and research related to them will continue to grow.

https://www.google.com/search?q=wellness+leed&espv=2&biw=1363&bih=666&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiR-cnNzpTQAhVnzFQKHXOEDIQQQ_AUIBygC#imgrc=I0UmU6Vp2xN6BM%

RIGHT: “The WELL Building Standard™ is an evidence-based system for measuring, certifying and monitoring the performance of building features that impact health and well-being.” As LEED has made sustainable design much more visible to the public and clients, the WELL Building Standard (nearly released) might do the same for “healthy” buildings.

https://www.wellcertified.com/sites/default/files/resource-images/standard-thumb1_0.jpg
https://www.wellcertified.com/
Investigation of Architectural Glass Characteristics
Karen Kensek and Douglas Noble

Project Description
Look towards the skylines of the major cities at the increasing use of “transparent” facades, delve into the role of specialized glass for energy savings, marvel at the innovative use of special glass types including electrochromic – glass is deeply effecting design decisions. This proposal includes two parts: 1) electrochromic glass research and 2) prototype development of class materials about architectural glass. Part 1 is already in an introductory stage as two MBS students are getting hands-on experience at working with and setting the controls for electrochromic glass as part of their thesis topics. The proposed research would go beyond their studies. Part 2, the investigation of glass characteristics for the development of teaching material, has not yet been started. We have been approached by a company in the architectural glass field to develop strategies for integrating glass education into the traditional materials and methods courses that are typically associated with a professional architecture curriculum. This will include the preparation of a set of materials that can be adopted and modified by architecture faculty across the country. Students need a better understanding of this material. Most faculty do not have time to spend developing more teaching material to do this. We propose to fill that gap.

Research Objectives
Part 1: working with an industry partner, to develop a deeper understanding of the characteristics of electrochromic glass especially in terms on potential energy reductions and comfort.

Part 2: to create a framework for teaching the contemporary use of architecture glass as the initial step in pursuing further funding.

Funding Sources
We are actively pursuing funding for both topic areas. For the first area, we have already received an in-kind donation of electrochromic glass. For project 2, it is likely that we will be able to receive funding, but the company (who wishes to remain anonymous at this point) would like to see a preliminary study and a proposal completed first. A Façade Tectonics member will match the hours provided by the GRS program for the student.

Deliverables
Two deliverables: a study of the characteristics of electrochromic glass and a sample mini-syllabus for a section of a course to teach the fundamentals of glass as an architecture material to 2nd or 3rd year students and graduate students who have little to no previous background which might also include outlines for potential homework assignments.

Student applicants should be willing to research what other universities are doing, become reasonably knowledgeable about the topic of architectural applications of glass, and be able to write well (in English)
Glass glossary
Glass examples

Karen notes (not for inclusion in the proposal)

Syllabus
Field trips (glass facades, glass artists)
Sketching
3D detailing
Case study
Readings
Experiments
Performance

http://www.explainthatstuff.com/glass.html

On other sites

• The Corning Museum of Glass: Explore the history of glass and glassmaking in Corning, New York.
• The National Glass Centre: A glass museum at the University of Sunderland, UK.

Books

• Introduction to Glass Science and Technology by J.E. Shelby. Royal Society of Chemistry, 2005. An undergraduate text covering the chemical and materials-science aspects of glass. Covers the various different types of glass and their mechanical, optical, and other properties.

Podcasts

• BBC Radio 4: In Our Time: The Science of Glass by Melvyn Bragg, May 28, 2015. Interviewed guests include physicist Professor Athene Donald. (43-minutes, can be downloaded as an MP3.)

http://ap.buffalo.edu/news-events/alumni-magazine/research-spotlight/Material-investigation.html
https://www.exploratorium.edu/snacks/disappearing-glass-rods
http://physicscentral.com/explore/action/safer-glass.cfm -- have students create videos of glass
To: GRS Program Coordinators

GRS Proposal Abstract

Circadian Lighting Design:
A Circadian Daylighting Metric and Design Assist Tool for Improved Occupant Health and Well-Being

I am requesting one Graduate Research Scholar (GRS) to help me to develop a daylighting metric capable of assessing the circadian potential of architectural space. Indoor lighting is often provided by electrical sources that are adequate for performance of visual tasks but lack the appropriate spectral composition and intensity required to stimulate the circadian system. Disruption of the circadian system can lead to poor sleep, reduced alertness, and increased risk of a range of health problems including diabetes, obesity, cardiovascular disease and cancer (Zelinski et al. 2014). All zones within a building that do not regularly achieve the lighting conditions necessary for effective circadian stimulus can be labeled as biologically dark, and considered as zones where regular occupancy may be problematic for health and well-being. Procedures using annual, climate-based daylight analysis of eye-level light exposures will be developed to map the circadian effectiveness of a given space. The metric and visualization techniques will be implemented in a parametric, simulation-based workflow utilizing publicly available software tools. The workflow can be used to assess and differentiate the performance of various daylighting strategies during the design phases of a project, or to quantify the circadian effectiveness of existing spaces.

Summary of project outcomes
This research will translate available photobiology research into an evidence-based performance metric architects can use to shape the built environment to better-support health and well-being across a range of common building types and uses. A software-based Design Assist Tool will be developed to apply the metric in a design context.

Relevance
This work is directly related to our school’s efforts to build relationships between design and health. Participation would be relevant for student interested in exploring the advanced lighting simulation, tool development, and the challenges of effectively informing design practices with simulation-based data.

Funding
The research has recently received a 2016 National AIA Upjohn Award and will be funded with $20k from the AIA for the period Jan. 2017 to May 2018.
To: GRS Program Coordinators

GRS Proposal Abstract

Evaluating the Daylighting Effectiveness of 8 Dementia Care Facilities in Southern California

I am requesting one Graduate Research Scholar (GRS) to help me survey indoor spaces at eight dementia care facilities in southern California. On-site surveys, combined with physical lighting monitoring will be used to develop calibrated digital lighting models of each space. The daylighting “performance” of each model will then be evaluated using annual climate-based simulation techniques (see my other GRS request). Daylighting outcomes will be compared with health-based measures taken from a target of 160 residents at these facilities to examine potential relationships between daylight access and factors of depression, cognitive ability, and behaviors (i.e. sleep / wake patterns, aggression, falls etc.).

Summary of project outcomes
This research seeks to develop an “asset rating” for dementia care facilities that values a particular property relative to the daylighting performance of regularly occupied spaces. Research findings will be published in a health sciences journal and student will have opportunity to contribute to the manuscript and receive publication credit.

Relevance
This work is directly related to our school’s efforts to build relationships between design and health. Participation would be relevant for student to learn basic skills such as on-site survey techniques, translation of measured data to digital models, simulation of digital models, and more complex skills, such as examination of model fidelity with real world, and impacts of “real world” performance on human health and well-being.

Funding
The research will be supported by a gift of $10k from the National Investment Center for Seniors Housing & Care (NIC).
Project Description and Research Objectives
Robots will change not only the building process by working safely, tirelessly, and in tight or complex situations but they will redefine both design and production by changing the way we think and operate within these cycles. Robots may also change the way the built environment operates. For example, we may use robotics to monitor built façade systems by checking in real time critical data such as energy usage, indoor conditions, thermostats, operable windows and blinds. In short, robotics will change our world in ways we are only just envisioning.

In the very near future, robotics has the potential to override the current digital fabrication model of sending full sets of CNC instructions to complete a 3D process. This process, currently used by milling machines and 3D printers, necessitates that design and fabrication geometry be known and fixed before fabrication begins. By incorporating feedback loops within robotics, a new level of complexity for building may be achieved thus providing new methods for working with bespoke and anexact geometries, a clear trajectory of architectural tectonics.

Drawing from my degree in electrical engineering and twelve years of experience in visual effects and image processing, I want to research the possibilities for the future of robotics in architecture. While architectural design is a creative process, technology has become a core component of our toolset. My unique background in both engineering and architecture enables me to explore architectural possibilities that require cutting edge technical expertise and sophisticated artistic judgment. With this background and a solid track record in design, I feel strongly that I can envision, perhaps better than most, the possibilities for design in architecture through robotics.

This proposal is for researching sensor data collection and manipulation. Specifically the goal is to collect and analyze vital information such as object geometry collected via camera. Simple image processing software can process the collected camera data and, when inserted into a feedback loop, directly impact the fabrication process. Control over this type of feedback loop can open up new production methodologies that can be used both for final fabrication and design process modeling.

The proposed research is highly publishable and follows on from the published paper entitled A Method for Mass Customized Mold Making in Robotic Fabrication in Architecture, Art and Design 2014 by Wes McGee, Monica Ponce de Leon, Aaron Willette, Sigrid Brell-Cokcan, Johannes Braumann. Possible publications for this research include Rob|Arch 2018, the conference and publication for robotics in architecture, art and design. The Acadia Design Agency publication is another strong possibility.

Funding Sources
The Graduate Research Scholar program is the sole funding source at this time but my industry contacts within the field of computer graphics and visual effects may augment this research, yielding access to technology in the form of hardware and/or software, through beta programs and other similar development cycles.

Deliverables
- Research and procure available rgb-d (camera) sensor(s) that can be integrated with USC’s Kuka robots
- Obtain the software and expertise to control the sensor
- Incorporate the sensor data into a feedback loop
- Design and test a geometric fabrication problem as proof of concept of the feedback mechanism
- Final deliverable will be a paper targeted to Acadia or RobArch
Summary:
I am currently working on two book projects – one that is now a full manuscript (which is now being edited and adjusted to send to potential publishers), and one that is just now being researched and outlined to eventually turn into a book proposal. I am looking forward to working with a student on both projects – with the majority of time being spent on the second (newly outlined) book proposal – with the GRS student doing research.

Book Project #1: The working title of this book is Spatial Truths and Temporal Fictions: Cinematic Representations of the American City 1938-1978. This book focuses on two works of cinema—The City (1939) and Killer of Sheep (1977) – both of which together bracket a critical forty-year period in development of the American city. It is during this span of time that a paradoxical conditioned emerged in the United States – where the country became on the whole less segregated on a national scale, yet re-segregated to near-equal levels within each metropolitan region. Film, as a time-based art form, proved to be a particularly apt medium to represent the relationship between physical mobility and social mobility for all Americans during the first half of that century (as discussed relative to The City and Black migration narratives), as well as the consequences of the lack of mobility and opportunity afforded to some Americans based on race in the second half of that century (as discussed relative to Killer of Sheep and other alternative films appearing in the late 1960s and early 1970s). While the two films are antithetical to one another in terms of their narrative structures and temporal organization, the films share a common commitment to engage the medium of film itself as a tool for social persuasion – attempting to bring the far and the forgotten near, canceling out the distance so often created through strategies of segregation, intentionally blurring the line between fiction and documentary modalities, and forcing us to encounter through direct address (via “the voice” in The City and the form of “the look” in Killer of Sheep) what we had hoped to have hidden though physical distance through in the ‘real’ city.

Book Project #2: The working title of this book is Wasted: Cinematic Representation of Children in the Global City. This book studies several works of cinema and looks at the “place” of children and teens within the global city. The potential selections included: Ashley/Morris Engel/Ruth Orkin’s Little Fugitive (1953) to Larry Clark’s Kids (1995), Stanley Kubrick’s Clockwork Orange (1971) to Menhaj Huda’s Kidulthood (2006), François Truffaut’s The 400 Blows (1959) to Mathieu Kassovitz’s La Haine (1995), Suzana Amaral’s Hour of the Star (1985) to Victor Gaviria’s Rodrigo D: No Futuro (1990), Levitt et al’s In the Street (1948) to Martin Bell’s Streetwise (1984), Charlie Chaplin’s The Kid (1921) to Charles Lanes’ Sidewalk Stories (1989), Jennie Livingston’s Paris is Burning (1990) to Gus Van Sant’s My Own Private Idaho, Pedro Costa’s Osso (1997) to Colossal Youth (2006), from Lee Daniel’s Precious (2009) to Dee Rees’ Pariah (2011), Charles Burnett’s Killer of Sheep (1977) to Spike Lee’s Do the Right Thing (1989), Katsuhiko Otomo’s Akira (1988) to Kim Moon-saeng’s Sky Blue (2003) etc... It looks at this population that is so often at odds with their environment, to see what this might tell us about the ideological limits of how we define cities and the allocation of resources (both fiscal and spatial) within them.

The deliverables from the faculty member will be one completed manuscript to be sent to publisher, and one completed summary and outline for future book proposal. I will be writing two grant proposals in relations to the second project during this time period but at this point there is no additional funding in place.

Students who are interested in cinema, architecture and urbanism should apply – particularly those who like doing basic library research, bibliography development, searches with JSTOR, Avery, and other academic databases, diagram development and editing. The relevance to pedagogical and research initiatives is mainly based on the ability for an interested GRS student to learn how to conduct complex cross-disciplinary research relating to the fields of architecture, urbanism, and cinema. Any student involved in the project will be credited for work produced in final publication.
We have been working with the Ranger staff of Joshua Tree National Park for almost five years, and are getting close to the completion of a design guideline publication for review by the National Park Service. There are 59 regular National Parks in the United States, plus a few hundred additional special places that are managed by the National Park Service, such as historic sites like the National Mall in Washington DC. Joshua Tree National Park is a place of extreme natural beauty. It has a long history of human habitation, and they get more than a million visitors each year. Unlike Yosemite, they do not have any good buildings. The National Park Service has partnered with the students and faculty of the USC School of Architecture and spent several years examining the architecture, the human history, and the natural conditions of Joshua Tree National Park. The project involves working with the faculty members, and several chapter contributors, to complete the final stages of the publication and prepare it for submission to the National Park Service by Summer 2016. Though it sees well more than 1,000,000 visitors a year, Joshua Tree National Park is often overlooked and sometimes treated as a “baby brother” park to Yosemite, Yellowstone and the Grand Canyon.

Chapter 1: PURPOSE: Observations, Principles, Recommendations
Chapter 2: PLACE: Observations of the Natural Environment
Chapter 3: PEOPLE: Observations of Human History and the Existing Built Environment
Chapter 4: PARK: Observations about the National Park Service
Chapter 5: PERILS: Observations of Perils to the Future of the Park
Chapter 6: PRINCIPLES: Identifying Desirable Essential Characteristics
Chapter 7: RECOMMENDATIONS FOR ENVIRONMENTAL DESIGN
Chapter 8: RECOMMENDATIONS FOR INFRASTRUCTURE
Chapter 9: RECOMMENDATIONS FOR HERITAGE CONSERVATION
Chapter 10: USC CASE STUDIES: Testing the Recommendations with Hypothetical Design Projects
GLOSSARY
BIBLIOGRAPHY
APPENDIX
CONTRIBUTOR BIOGRAPHIES
A conference hosted at USC will coincide with the publication of the Facade Tectonics Journal: Precast Concrete. This bound, color publication will focus on new information that advances the state of the art in the area of precast concrete use for facades and the building envelope. Top researchers and select industry experts in the precast concrete field have contributed original papers to the Journal. This project is nearly complete, and could be accomplished with the help of one GRS.

ROBOTIC FABRICATION OF ARCHITECTURAL PRECAST PANELS: Contour crafting technology developed at USC eliminates the need for forms

THE LIQUID WALL - A CASE STUDY IN INNOVATION: A novel fiber-reinforced UHPC curtain wall system

TAILORMADE CONCRETE STRUCTURES: Architectural opportunities in robot fabricated concrete formwork

THIN WALL ENERGY EFFICIENT COMPOSITE WALL SYSTEM AND APPLICATIONS: A sandwich wall panel system that is highly efficient both structurally and thermally

ARCHITECTURAL PRECAST CONCRETE PANEL PRODUCTION WITH 3D ADJUSTABLE FORMING: The unique challenges posed by the cladding design for the Salt Lake City Library

GLASS FIBER REINFORCED CONCRETE: The look, performance and durability of concrete at one third the weight

FABRIC-FORMED PRECAST PANELS: Simple, economical formwork for natural forms and structural efficiency

INFRARED SURVEY OF HIGH PERFORMANCE PRECAST PANELS: A case study in Colorado

INNOVATIVE USE OF FRP FOR SUSTAINABLE PRECAST STRUCTURES: Using carbon-fiber-reinforced grids in walls and other components

PLUG AND PLAY - Precast Facade Design and Construction Integration: The Perot Museum of Nature & Science

MODULAR – MACHINE-AGE – MONO-MATERIAL: Reviving Frank Lloyd Wright’s textile block
CASE STUDY HOUSE PROGRAM 2.0
Gary Paige, Associate Professor of Practice

Introduction
Almost seventy-five years have passed since John Entenza, the progressive editor of Arts & Architecture magazine launched “The Case Study House Program.” Running intermittently from 1945 until 1966, 36 experimental houses were designed as prototypes for post-war housing by architects J.R. Davidson, Charles and Ray Eames, Richard Neutra, Rafael Soriano, Craig Ellwood, Pierre Koenig and others. Unparalleled in its scope and ambition, the initial pro forma stipulated that eight houses would be designed and built by eight different architects and serve as models open to the public for a period of six to eight weeks. Six houses were completed by 1948 and visited by more than 350,000 people. In all, 36 projects were designed and 24 built including several of the most significant examples of modern American residential architecture. Arguably, no other modern or contemporary housing program has addressed the issue of domestic architecture in such a comprehensive and innovative manner, as a form of design research and creative speculation.

Fast Forward: 2017
It’s clear that the idea of the house—as a typology and domestic environment—should consider and accommodate alternatives to the traditional nuclear family. Today, the “family unit” is as likely to be a single-parent, multi-generational, same sex, new couple or live-work arrangement than a family with 2.3 children. Yet, in spite of this, there’s a dearth of research and speculation into new or alternative models of urban dwelling, not only in the public and private sector but also, in schools of architecture. Consequently, the research agenda for this project consists of two equivalent parts:

Part 1: Historical Research
Conduct historical research into Entenza’s Case Study House Program by looking critically at the built (and unbuilt) works. Specifically, we’re posing the questions: What did the CSH Program mean back then? What does the CSH Program mean today? In what ways are particular Case Study houses relevant today? And, what are some of the lessons that the program and houses offer?

Part 2: Case Study House 2.0
Part 2 seeks to address the topic in two ways:
A. Reimagine what the Case Study House Program could be today, as an experimental project and/or program;
B. Design a series of speculations—prototypes or “cases”—that reconsider and extend the initial Case Study House pro forma in a way that’s critical and contemporary. The outcome or result will take the form of a series of diagrams and drawings, models, and a publication-ready pamphlet (in the manner of the Pamphlet Architecture series).

Case Study House 2.0 has multiple learning objectives and pedagogical relevance that’s not only intended to reassess the Case Study House Program but more importantly, to reimagine it as a contemporary project of critical significance for the discipline as well as the SoA curriculum. The project is ideal for students with skills and interests in:

• Field research on Case Study houses in Los Angeles;
• Participating in the design and development of alternative house prototypes and models for Case Study 2.0; and,
• Topics of architectural representation and graphic design including: producing diagrams, analytical and design drawings and, InDesign layout work and publication mock-ups.
GRS Proposal/Abstract 2016

Submitted by:
Hadrian Predock, Director of Undergraduate Programs and
Associate Professor of Practice

Abstract

**Learning from Los Angeles**

The USC School of Architecture is the oldest undergraduate architecture program in Los Angeles and as an institution carries the strongest potential to translate institutional and cultural memory into the present construction of the identity of the school. This entails a new “ownership” of Los Angeles as disciplinary focus, which is carefully crafted into the fabric of USC’s curriculum. LA remains inexhaustible as a subject for architecture yet no one school claims this as their turf. New understandings and conceptual relationships to LA will solidify USC as THE school that is working on LA as its primary content – an internal understanding of a rapidly evolving and truly 21st century agglomerate – that can then be externalized and made global in its reach and relationships.

The GRS proposal will set the stage, not only for a consequent seminar and studio during 17-18’, but more ambitiously for the future course and identity of the undergraduate architecture programs. This research phase will set the stage for new and vital understandings of LA. Beyond a collection of scholarship that ranges from modernist emigres to contemporary issues, this work will be projective in nature, collecting and organizing the current cultural landscape of Los Angeles into newly curated categories. Following on the heels of Pacific Standard Time and the vast archive that was disseminated and collected for that project, the GRS research phase will collate this amazing data base into strains of thought that will be worked on through the USC UG curriculum in both studios, and other courses. This initial work promises to affect an ecology of faculty, content, and external audiences. Deliverables will include studio content, seminar work, symposia, lectures, exhibition(s) and publications over the next several years.

Through this initiative, USC will define itself in and around the cultural and physical landscape of Los Angeles for years to come.
GRS Abstract
Jose Sanchez – jomasan@gmail.com

Research project: “Architecture for the commons” publication

Relevance: Research in the topic of ‘the commons’ has become a critical form of design activism that seeks to develop mechanisms for the proliferation of design outside a neoliberal paradigm. By the study of open-source, creative commons licenses and platform co-operativism, this research seeks to contribute to the infrastructure of a sharing economy. The discretization of parts and the development of digital infrastructures like video games allow to consider the proliferation of design in the hands of a much larger public. Far from perpetuating a ‘star-system’ in architecture, the return to the commons suggests that academia and practice takes seriously an architecture for the middle class, one that needs a much larger set of players to participate and engage with the decision making process.

Objectives: Research and documentation surrounding ‘the commons’ for an upcoming publication proposed to Routledge.

Tasks:
- Study of license formats: Creative commons, general purpose license
- Study of forms of organization: Platform co-operativism
- Study of digital infrastructure: Blockchain technology, smart contracts, digital currencies.
- Study of contemporary vernacular: Tiny house movement, Open source architecture
- Study of neoliberal practices in design and possible resistances.

Deliverables: The research has a documentation component and the development of ‘patent drawings’ that can start to identify a new language for architectural and design communication that is at the service of protection from market enclosures and copyright.
GRS Program Proposal for 2017

**Landscape Architecture as Necessity**

Principal Investigators:
Kelly Shannon, Professor + Director of the Graduate Program in Landscape Architecture + Urbanism
Alison B. Hirsch, Assistant Professor in Landscape Architecture + Urbanism

Description:
As climate change rapidly takes its place at the forefront of contemporary global challenges, landscape architecture is becoming an ever more urgent necessity. The aim of this project is to craft a book from the significant contributions to and conclusions drawn from the *Landscape Architecture as Necessity* conference, held at USC on September 22-24, 2016 (http://landscapeasnecessity.uscarch.com) and co-chaired by Kelly and Alison. The GRS will be expected to work closely with Kelly and Alison, the book's editors, on tasks that range from layout, graphic and editorial work to coordination with the publisher to correspondence with the numerous contributors who represent some of the leading names in landscape architecture as well as burgeoning scholars from all over the globe.

While within the design community landscape architecture has come to be seen as a savior of urbanism, the field is still frequently overlooked as a design framework for restructuring environments in the face of impending human-caused challenges, including the increasing incidence of droughts, floods, forest fires, landslides, as well the complex dilemmas of both massive urbanization and cities with shrinking populations. In addition to addressing such pragmatic requirements, landscape architects have the responsibility to sustain the discipline's cultural mandate. This book will therefore be a call-to-action, as well as record of projects that have set this new standard for the field.

The book has both international and regional scope, using Los Angeles as a significant case study to examine the field’s most pressing concerns. The growing ecological crises and intense population pressure of Los Angeles’s coasts, flatlands and foothills are a *pars pro toto*, a microcosm, of the challenges facing state, nation and globe.

Project Product:
The book will be curated over the course of the year for publication by a press regarded for its emphasis on landscape architecture, such as Princeton Architectural Press or Routledge. Proper publication credit will be granted GRS.

Expected GRS Deliverables:
The GRS will be expected to work closely with Kelly and Alison on: layout, graphic and editorial work; acquiring image reproduction/copyright permissions; coordinating with the publisher; corresponding with book contributors; among other tasks.

Required:

Funding:
We will be applying for grants (USC and external) to subsidize the book and image quality.
GRS Program Proposal for 2017

Dams, Reservoirs & Urban Globalization
Principal Investigator:
Kelly Shannon, Professor + Director of the Graduate Program in Landscape Architecture + Urbanism

Description:
I have a signed contract (September 2015) of 450 pages with Science Publishers/ CRC Press (Taylor & Francis Group) to edit a book on the subject of dams, reservoirs and urban globalization. Bruno De Meulder was initially a co-editor with me on the project, but withdrew several months ago. All is due in London at the end of 2017. I received one GRS for this project last year and work is in progress; there is still a great deal to do. I would like to see if it is possible to apply for 1.5 GRS (to continue with Donielle Kaufmann who is a GRS working with me now and who is expected to graduate in May) and a new GRS (continuing student) for the two semesters of 2017; it would immensely help the project.

Dams, Reservoirs & Urban Globalization will deliver a state of the art on the unmatched and colossal flagship of global modernisation—the twentieth century large-scale hydraulic manipulations of landscapes—dams and reservoirs. Increasing in volume and number by generation, they are witness of a technological capacity that nears hubris. They are considered ever-lasting base infrastructures for the water and energy supply to ever-larger populations. As such, dams and reservoirs, were, and still often are, considered as symbols of modernization. By taming and regulating wild and irregular natural forces, they turn potential into an assured promise of development and progress. Tested and perfected in the industrial world, dams and reservoirs were quickly spread worldwide and, in a tangible way, supported globalization. The Three Gorges Dam—larger than any before it—is merely one of the testimonies of the resolute belief in dams as an instrument of development and the expectation of affluence thought to automatically follow in its wake. Dams and reservoirs illustrate, as no other construction, the etymological meaning of infrastructure: the basis of a system (of development). However, dams and reservoirs are also highly contested due to their enormous ecological and environmental impacts, as well as the often dramatic social and economic consequences for resettled populations and their painfully unfulfilled expectations of development. The in-depth case studies reveal that many dams throughout history and throughout the world have proven themselves to be outdated developmentalist white elephants, instruments of (neo)colonialism or is that labeled neoliberalism and globalization today?

The edited volume focuses on dams and reservoirs as instruments of modernization and devices that structure landscapes by bringing together experts who advance a broad set paradigmatic, yet in general not very well-known or studied, case studies that cover colonial and postcolonial episodes around the globe: primarily focusing on examples in Africa, Asia, Latin America and that span from the second half of the twentieth century until today with however excursions to indigenous systems and explorations of more environmentally friendly contemporary experiments such as emerging practices of river restoration. Traditional contexts, nation-state building conditions of modernization, successive waves of imperial enterprises of different nature pass in review.

Graduate Research Scholar work:
1. proposal for Donielle Kaufmann to continue in spring 2017 to research for the book’s introduction which has two components:
   1. essay: Dam(ned) Urbanism, Revisiting the Technological Wet Dreams of Modernism
   2. illustrated timeline: Damming & Reservoir Building Since 1900
2. proposal for a new GRS to liaise with the authors for chapters of book (and particularly help in coordinating the illustration and illustration quality (perhaps redrawing plans)

Relevance to the Pedagogical & Research Initiatives of the Graduate Program in Landscape + Urbanism
> hone critical research skills in relation to critical issues facing the contemporary built environment
> develop sharp graphic skills in order to communicate clearly to both a specialized and more general audience
Diagramming Smart Geometries for Responsive Facades

USC SOA Faculty: Professor Doris Sung
Research Period: January-December 2017
Number of Students: 1

RESEARCH OBJECTIVES
In the development of responsive materials for building application, geometry plays a significant role on two levels: in the design of the four-dimensional operation, and in the alteration of the behavior of smart materials. These issues are specific to designing with shape-changing materials, and are additional to the standard problems of fabricating, tessellating, pattern-making, assembly sequencing, and making building façades performative. Rather than altering the various bonds, ingredients and characteristics of materials at a molecular level (a common task of the material scientist), the simple manipulations of the overall geometry of the raw material can provide enough control to change, negate, retard or enhance the natural behavior of that material.

Professor Sung is currently writing a book on this subject and seeks to identify and analyze multiple projects for publication. Each analysis will be meticulously diagrammed in preparation of inclusion in the final layout.

DELIVERABLES
Student(s) will work with Professor Sung on developing a comparative system of evaluation, criticality and representation in Spring 2016. Several case studies such as wood veneer pieces by Achim Menges, Hirsuta by Jason Payne or filaments by Philip Beesley will be used to test the newly developed system. A list of related projects will be compiled in preparation for documentation and production over the summer by a small group of undergraduate students under the URAP program. In fall 2016, the range of parts will be compiled into a document in preparation for publication.

RELEVANCE TO PEDAGOGY AND RESEARCH
Students will be exposed to:
--analytical diagrams with specific geometries and shapes at various scales in movement;
--collection of information, images and data;
--layout techniques in architecture;
--drawing standards with strict lineweight parameters; and
--the problems of working in print medium on projects that are animated and constantly moving.

SKILLS SOUGHT
--Digital skills: Rhinoceros, Grasshopper, Autocad, InDesign, Illustrator
--Rendering and digital graphic skills
--Writing and editing skills
Green Space, Air Quality, and Obesity: Healthy Urbanism in Polluted Cities

Travis Longcore, Ph.D., GISP

Awareness among landscape architects, urban designers, and urbanists of the need for green spaces to promote physical activity and combat obesity is high and provision of recreational opportunities in park-poors communities is perceived as an unmitigated good. The adverse health consequences of breathing polluted air is likewise well known, but generally assumed to apply to respiratory diseases such as asthma and lung cancer. Recent research, however, has documented that exposure to air pollution can result directly in increased propensity for obesity, through exposure to particulates and chemicals that disrupt metabolism and promote fat accumulation (McConnell and others 2016). Air pollution is also linked epidemiologically with diabetes and cardiovascular disease. Urbanists therefore face a challenge of balancing the benefits of a landscape that promotes activity and provides green space in park-poor neighborhoods, and the adverse impacts of exposure to air pollution, which is exacerbated during exercise. Planners and designers need high-quality information to guide location and attributes of green spaces if the benefits are to outweigh the harms. The objective of this research is to promote such integration between environmental health scientists, urbanists, and the nonprofit communities promoting green spaces in urban areas.

The Graduate Research Scholar will support the exploration of this topic and its intersection with landscape architecture and site design. The deliverables of the research will be: 1) a review of the scholarly literature about healthy park design with specific attention to air quality and air pollution exposure, 2) a series of case studies of precedent designs and designers that integrate air quality considerations into development of healthy green spaces, and 3) a series of illustrations that depict best urbanism practices that derive from a one-day conference on this topic being organized by USC Environmental Health Centers for Spring 2017.

The project represents a collaboration with the Environmental Health Centers at the USC Keck School of Medicine. The Centers will hold a one-day workshop in Spring 2017, funded by at least $10,000 of internal funding. The GRS will work with environmental scientists from Keck to best integrate urban design precedents into the meeting. This collaboration will be used as a starting point to explore further collaborations to develop interdisciplinary approaches to healthy park, site, and urban designs.

The research is consistent with a goal of integrating environmental performance metrics into design and informing design with the best available science to produce sustainable and healthy communities.


November 8, 2016