

HXS: A journey of an architecture firm to create a human experience lab in the hub of architectural practice

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The cognitive approach towards architecture can make communication path between architecture and neuroscience. It concentrates on neuro-architecture researches. This paper investigates the effects of architectural elements of building facades on emotional behavior. We analyzed the effects of those elements in 3 categories: geometries, materials and proportions. The purpose of this paper is to distinguish the effects of building façades elements on lobes & signals of the brain.

I. EXTENDED ABSTRACT

The relationship between architecture, perception and brain behavior is no longer in debate (Eberhard, 2008; Arbeib, 2012). What remains a challenge is investigating these relationships, outside of academia, in the hub of architectural practice. Within the scope of practice it can be a challenge to do deep dive, generalizable research with strictly controlled conditions. What practice can, however, serve as, is a test bed for experiments within the scope of real projects, that are pilots for more systematic investigations with academic/industry partners. It can also serve as a testing ground for research that has been established in academic settings but not applied in practice.

It is with this thought that HKS, a global architecture firm, has invested in a new 200 sq ft space for rapid prototyping, sensor-based assessments, and simulations. The concept of the lab/studio has evolved over a couple of years through a series of internal experiments including:

Experiment Lvl 1: Using full scale mock-ups to get user feedback to 3-D built form prior to design. Using Full Scale Mock ups to simulate physical space and behavior scenarios to change space layout.

Experiment Lvl 2: Merging human activity data into a sequence simulation tool. Using data from field research to inform parametric planning tools that are integrated into revit platforms.

Experiment Lvl 3: Using EEG signals to manipulate physical form. Utilizing commercially available EEG hardware and building a custom interface for it with CAD software, exploring the possibilities of manipulating a digital models based on thought input.

Experiment Lvl 4: Developing a prototype for a sensory Design Lab. Tracking human responses to environmental changes in real time with continuously monitored environmental and physiological outcomes.

The idea for a physical space, a hybrid lab/studio emerged through a need to create tangible, physical, three dimensional environments which we can test with evolved sensor technology. Three critical components were initially identified:

1. **Think Space:** A space where designers and researchers can come together and ideate on exploration and innovation.
2. **Make Space:** A space where designers can create three dimensional realities based on dialogues with research teams
3. **Test Space:** A space where researchers can test the efficacy of design solutions to inform new iterations

In practice- the three spaces may overlap, just as the role of the designer and researcher may merge. However, the science of systematic inquiry must be balanced with the art of creative thinking – so where do the two meet? We will explore this question with the audience. We will also honestly share the challenges we have gone through in the creation of such a space including:

1. Framework Flexibility
2. Cost vs. Value
3. Sound proofing
4. Building walls vs. leaving open spaces
5. Understanding scale of relevance for VR- from oculus rift to full 3D immersion.

We would like to use the session to have an open dialogue with the academic and industry partners in the room to discuss how a research based “studio” can be created- one that puts human experience and response at the center- and crafts environmental and spatial scenarios around it, positioned to test a dynamic boundary between biometrics and parametrics. We also seek to understand how a lab like this, situated as it is in practice, with a “test sample” of 500+ architects/designers can benefit ongoing studies in the academic community. Our intent is to step outside inward looking investigations to creating bridges to path-breaking discoveries and innovations so we can be both test bed, and agent, for change.

2. REFERENCES

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3. AUTHOR BIO

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