

## **TITLE: LESSONS FROM NEUROSCIENCE: BUILDING BLOCKS FOR CHARTING NEW FRONTIERS**

### **ABSTRACT:**

The argument that the environments impact human perception and behavior, and vice versa, is not a new one. The field of environmental psychology is based on just such a tenet. Even so, over the years while psychology has dug deeper into the recesses of the mind, and begun to navigate the synapses of the brain, investigations in the field of environmental psychology have not been able to do the same. A fundamental dilemma-that of simulating three-dimensional environments, while being able to map brain behavior (which is still a rather confined activity) has made this initiative daunting. In this presentation we identify a common unit between architectural environments-and fMRI experiments-"the visual image." Architecture relies on visual images to conceive, design, present, and even experience environments. FMRI experiments use visual images to induce desired mental states-particularly to induce specific emotions.

In this presentation the authors will share findings from a literature review (of over 30 articles) on fMRI studies that link specific image properties to brain behavior during the experience of fear, anxiety or pain. Identified visual properties include objective properties like contours, spatial frequency, and contextual association, and subjective properties like valence, arousal and dominance. The key role of the amygdale in emotional processing, and what this means to the design field will be discussed. Authors will then extract these insights from two-dimensional images, to the larger three-dimensional context and discuss what the relevance of such investigations would be to the field of architecture-especially fields that deal with vulnerable populations such as healthcare and justice. Finally authors will pose a series of hypothesis for both architecture and neuroscience, to spark a dialogue between experts in the two fields and chart new territories for the interface between the brain and the environment.

### **AUTHORS:**

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**Bio:** Upali Nanda has a PhD from the Department of Architecture at Texas A&M University, with a certificate in Health Systems and Design, a Master of Arts in Architecture from National University of Singapore and a Bachelor of Architecture from School of Planning and Architecture, India. Upali has served as the Director of Research for American Art Resources since the inception of the Research unit, and currently serves as the Chair of of the Advisory Council for the REDCenter. She has presented her research at numerous conferences across the world, and has published in peer-reviewed design and medical journals. Her doctoral work has been published as a book "Sensthetics" available on Amazon. Upali is also a Research Consultant for the Center for Health Design, and serves on the Research Committee of the Society for Arts in Healthcare, the editorial board

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**Bio:** Dr Debajyoti Pati is the Rockwell Endowment Professor in the Department of Design, Texas Tech University. He also serves as the Executive Director of the Center for Advanced Design Research & Evaluation (CADRE), the non-profit R&D arm of HKS Architects. An eminent scholar in healthcare design research, Dr Pati was two-time winner of the Best International Research Award from the International Academy of Design and Health. He was twice voted among the 25 most influential people in healthcare design, and has published and presented extensively on healthcare research, healthy living, criminal justice, and performance-based design, internationally.