

“Meaning In Architecture: Affordances, Atmosphere and Mood,” 17 April 2018 Regnier Forum, An *Interfaces* event of the Academy of Neuroscience for Architecture (ANFArch.org).

“Today we are learning the actual dynamics of our motor cognition, or how our bodies actually engage with forms and continually interact with the boundaries of space. The dynamics of how people perceive or experience the built environment would seem to be a delightfully rich field for designers to explore.”

Harry Francis Mallgrave (2018)

Recent advances in science are confirming many of the architect’s expert bias, while opening new doors to the perception of space and the meaning of architecture and urban design. “*Meaning In Architecture: Affordances, Atmosphere and Mood*,” will present to an audience of architects and neuroscientists a conversation about human perception of design and building, specifically speaking to the significance of affordances, embodied simulation, atmosphere and mood.

Beginning Tuesday, April 17th at 8:30 am, the first talk is “*The Physio-Affective Built-Environment*,” by Dr. Brent Chamberlain, (Assistant Professor of Landscape Architecture and Regional and Community Planning, KSU) will discuss new methods for collecting data of the body in space. As the Director of the Advanced Landscape Immersion and Visualization Environment (ALIVE!), his research combines computer graphics, geo-visualization, information visualization, and GIScience to conduct scientific inquiry and understanding. His background in computing, ecosystem modelling and environmental psychology pushes the boundaries of science in perception of urban and natural environments. With Heath Yates, and William Hsu, Dr. Chamberlain published, “*A spatially explicit classification model for affective computing in built environments*,” which explored the potential of a wearables and sensors centric approach for collecting data in built environments. Similarly (again with Yates, Norman, and Hsu) their paper, “*Arousal Detection for Biometric Data in Built Environments using Machine Learning*,” studied using wearables to demonstrate the viability of measuring physiometric arousal indicators such as heart rate in assessing how urban built environments can induce physiometric arousal indicators in a subject. Working closely with colleagues in computer science, they aim to develop machine-learning approaches to classify sensor inputs based on annotated arousal output as a target. The results are then used as a foundation for designing and implementing an affective intelligent systems framework for arousal-state detection via supervised learning and classification.

Following Dr. Chamberlain will be a talk by Dr. Colin Ellard and Bob Condia, AIA at 9:15 am about their new research “*Place, Peripheral Vision, and Space Perception: a pilot study in VR*.” Their study will report on the consequences of central and peripheral vision in urban plazas of classical and modern articulation. The single most important outcome of this experiment was the dramatic demonstration of the prepotent power of the visual periphery for the generation of architectural

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experience. Dr. Colin Ellard is a professor of psychology, specializing in cognitive neuroscience, at the University of Waterloo in Canada. After spending his early career working on basic problems in visual neuroscience related to spatial function in animals, he has recently turned his attention to exploring the human relationship with built settings. Dr. Ellard is particularly interested in the emotional effects of architectural settings, which he explores in both field settings and in synthetic environments using immersive virtual reality. His current projects include exploration of the contribution of peripheral vision to architectural atmosphere, architectural contributions to the emotion of awe, and physiological stress in high-density urban environments. Dr. Ellard's work focuses on emotional and cognitive effects of built settings, using both field or laboratory approaches. Collin collaborates with architects to bridge the interdisciplinary divide. His recent book is Places of the Heart: The Psychogeography of Everyday Life. Allied, Bob Condia, AIA, is an architect and design partner with *Condia+Ornelas Architects*, and the 2017-20 *Regnier Chair of Architecture*. A Professor of Architecture, he teaches architecture as an art form with due considerations to neuroscience and a biological basis of aesthetic experience. Professor Condia's place in a neuroscience for architecture debate is as an architect seeking the consequences of the applied science for architects. He advocates that architects must learn something of the vocabulary and methods of a scientist, and teaches seminars on the shared vocabularies of aesthetics, spatial experience and visual perception like, "*Perception in Architecture: the meaning of spatial experience.*" He currently teaches the HOK sponsored-thesis studio, emphasizing building design, embodiment, and affordances in architecture. Professor Condia and Dr. Colin Ellard are continuing their experiments on vision and perception of urban environments.

"What goes on in the brain of architects designing a building, or in the brains of people experiencing architecture?" asks Dr. Michael Arbib, whose keynote will be "*It Takes More Than A Hippocampus To Build A Cognitive Map.*" At 10:30, he will include some remarks on cognitive maps in blind people before offering what neuroscience might teach architects. A pioneer in the interdisciplinary study of artificial intelligence, neuroscience and computation, the thrust of his work is expressed in the title of his first book, Brains, Machines and Mathematics (McGraw-Hill, 1964) which encompasses the notion that the brain is not a computer in the current technological sense, but we can learn much about machines from studying brains, and much about brains from studying machines. Arbib has made major contributions to computational neuroscience and pioneered the computational study of mirror neurons and (with Giacomo Rizzolatti) their relevance to the human brain's potential for language. 2012 saw the publication of Arbib's 40th book, How the Brain Got Language: The Mirror System Hypothesis, since followed by Language, Music and the Brain: A Mysterious Relationship and From Neuron to Cognition via Computational Neuroscience. After a career at Stanford and at the University of Massachusetts at Amherst, he combined research and teaching in computer science, neuroscience and more at the

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University of Southern California from 1986 to 2016. He is currently an Adjunct Professor of Psychology at the University of California at San Diego and a Contributing Faculty Member at the NewSchool of Architecture and Design in San Diego. After serving on the ANFA Board of Directors, including Vice-President, he now leads the ANFA Advisory Council. Michael is currently writing a book on the bond between neuroscience and architecture.

To encapsulate the morning's presentations and advance the common language for understanding the perception of space, Dr. Kevin Rooney will moderate a panel of the morning's speakers under the rubric of "How Architects can talk to Neuroscientists: How Neuroscientists can talk to Architects." With more in common than many suppose Dr. Arbib's suggests that, "It is in the very nature of science that it succeeds by focusing on parts of the whole. The challenge is to determine which the "right" parts are, and how lessons gained from the study of separated parts may provide a firm basis for study of the larger system formed when the parts are combined." The symposium "Meaning In Architecture: Affordances, Atmosphere and Mood," will advance the rhetoric of neuroscience in architecture to far-reaching advantage.

"Meaning In Architecture: Affordances, Atmosphere and Mood," 17 April 2018 in Regnier Forum, is an *Interfaces* event of the Academy of Neuroscience for Architecture (ANFArch.org). This symposium is sponsored by the HOK Studio and Regnier Chair for Research, and the Department of Architecture, at Kansas State University. The hosts will provide coffee and donuts beginning at 8:00 am. The program will run from 8:30 am to 12:30 pm with a break to refresh at 10:00 am. AIA HSW credits are expected. Although there is no charge for the event please RSVP to "plab2003s.com." For further information you can also contact Ms. Bedros, project manager, of the P-Lab 2003S. Parking is generally available in the K-State parking garage. From the garage, come north through the Student Union, across Bosco Plaza, bear east (right) around the old Seaton Hall towards the new Regnier Hall's main entrance next to Mechanics Hall. Regnier Forum will be straight ahead of you when coming through the doors.