Faculty: Justin Hollander, Associate Professor, School of Arts & Sciences

Project Locations: Boston, MA and Da Nang, Vietnam

Dates: June 1 – August 31, 2019

Project Title: Global Comparative Architecture and Urbanism: Exploring the 'Unconscious' Human Visual Experience of Da Nang (Vietnam) and Boston (USA)

Project Details: Today we live in an 'Age of Biology' where new findings in cognitive science coupled with new biometric tools can help us better understand human behavior. Technologies such as EEG, which measures brain waves, facial expression analysis software which follows our changing expressions, and eye-tracking software that allows us to record 'unconscious' eye movements, provide game-changing information about how our brain takes in our surroundings and directs our behavior - with key implications for human well-being and overall public health. While the environmental psychology literature is rich with evidence about ideal street widths, signage, lighting, signaling, and landscaping, this study is one of the first to show how biometric tools can dramatically increase understanding of how people actually respond to the places around them. This study provides new kinds of data on hidden, 'unseen' experience that determine human behavior. This information turns out to be germane in helping us better understand remarkably specific things, such as how difficult it might be to find the front door of a new house, how confusing someone might find signage on an unfamiliar street and how likely it would be for a visitor to walk down a sidewalk in a new neighborhood. For this study, we are using a relatively-new off-the-shelf biometric tool, 3M's Visual Attention Software (VAS), introduced in 2011, to measure the unconscious visual responses people make when presented with the various photographs of urban scenes in the two case study locations: Da Nang (Vietnam) and Boston (USA). We hypothesize that insights from this research will introduce new kinds of parameters for quantifying the effectiveness of architecture and more broadly indicate how biometric tools including eye-tracking emulation software, provide a viable means of both assessing and predicting the human experience of place and can help create redevelop neighborhoods that more successfully respond to intrinsic human needs and contribute to broader global well-being and mental health. This project is an extension of research from Professor Hollander's recent book Cognitive Architecture: Designing for How We Respond to the Built Environment, the winner of the Environmental Design Research Association's Places Research Award. He has continued to do research and publish around these themes, including a major research project funded by the New York City Department of Design and Construction and a smaller pilot funded by the U.S. Army through the Center for Applied Brain and Cognitive Science at Tufts. Through Professor Hollander's leadership, Tufts signed a Memorandum of Understanding (MOU) with Duy Tan University in Vietnam. The MOU provided funding to Tufts to initiate this project and hire student research assistants over the last year, to develop the framework for future collaborations envisioned by both parties (for which the Global Research Assistant program is a perfect example). Over the last year, Tufts and Duy Tan University faculty and students have been analyzing the photographs by creating heat maps, visual sequence diagrams, and regions of interest diagrams generated by the eye-tracking emulation software. This summer, we propose for the Research Assistant to spend time in both Boston and DaNang to validate our findings, collect additional photographs, analyze a new batch of photographs, and work closely with both Tufts and DTU faculty and students to interpret the results.

Tasks and Responsibilities of Research Assistant: Under the supervision of Professor Hollander and in collaboration with other Research Assistants, the Global RA will be involved in:

- Running of VAS software (eye-tracking emulation), which means uploading photos, operating the software, generating reports, exporting those reports into meaningful tables for additional analysis;

- Assisting in selection of locations for photographs, which means analyzing historic patterns of development, urban history, and architecture in both Boston and DaNang to recommend which areas of each city should be photographed.
- Photography in both Boston and Vietnam, which means setting up each shot, with attention to issues like shot size, angle, resolution, lighting, and presence of confounding objects (like trees and people) - Direct observation of building conditions in both Boston and Vietnam (including detailed and rigorous qualitative recording of conditions)
- Collaboration with DTU faculty and students to jointly interpret VAS results, which means attending research team meetings and brainstorming sessions both in Boston, DaNang, and virtually.
- Assisting in the writing of results

Qualifications:

- Strong analytical skills
- Strong quantitative data collection and analysis skills (experience with statistical software packages is a plus)
- Experience with photography

Description of Field Site:
Da Nang is a medium sized city, so students should expect to be in an urban setting.

Housing in Vietnam:

Students will stay in a dormitory with shared bathroom on the campus of Duy Tan University in Vietnam.