The built environment is increasingly expected to actively contribute to improving human health, well-being, and performance in measurable, predictable, and tailored ways. Examples of such environments include next-generation operating rooms [3], assistive, robotically augmented patient rehabilitation suites [2], and assistive manufacturing systems [3]. For high-performance buildings with complex program requirements and/or integrated systems, achieving such high-performance environments increasingly requires real-time interactive sensing, monitoring, actuation, and communication subsystems as well as connection to external networks of systems.

As a result, it is becoming necessary for designers to represent and anticipate cognitive and physical tendencies when interacting with the building’s systems in order to design the cognitive and ergonomic affordances to be offered by the building’s interactive systems. That is, the design of high-performance buildings is becoming entangled with user-experience design for software-controlled interactive systems. Architects’ roles, methods, and tools will have to evolve to participate in the design of such complex, interactive, integrated systems of systems. So, what are architects’ roles in such design challenges? And, how should we design complex, interactive, architectural systems (CIAS)?

Designing such building-scale, integrated human/hardware/software/environmental systems will expand the design team to include many other disciplines, especially: human factors engineers, neuroscientists, software developers, and systems engineers. We will have to establish shared modes of analysis, representation, and communication for human-building interactions early in the design lifecycle. This dissertation research examines these challenges and proposes a framework for bounding the challenges and a design method + tool for designing complex, interactive, architectural systems (CIAS), which we call CIAS-DM (DM = Design Methodology).

## References & Gratitude

This dissertation research examines the challenges of designing CIAS and proposes a framework for bounding the challenges and a design method + tool for designing complex, interactive, architectural systems (CIAS), which we call CIAS-DM (DM = Design Methodology). This dissertation research examines the challenges of designing CIAS and proposes a framework for bounding the challenges and a design method + tool for designing complex, interactive, architectural systems (CIAS), which we call CIAS-DM (DM = Design Methodology).