On Data Visualization and Interior Design

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I propose a discussion on the intersection of data visualization and interior design. The goal of this discussion is to tie together several current topics of conversation within the greater visualization community, uniting situated visualization and ubiquitous analytics with arguments about the delineation between data visualization and data art.

My personal motivation for proposing this discussion predates my interest in visualization itself, for I am the son of an interior designer. As a child, I would page through copies of *Architectural Digest* magazine and binders of CAD printouts, and these would inspire me to draw floor plans for imaginary homes as a form of amusement. Fast forward to the present, in which I continue to imagine places, albeit places that are augmented with representations of data. My research agenda is devoted to the topic of *ubietous information experiences*, where *ubiety* refers to a sense of place [1], a term that is related to and yet is distinct from *ubiquity*, which implies a sense of pervasiveness, or being in all places at all times. A ubietous information experience is therefore one that is appropriate for a specific place and time. Of particular interest to me are representations of data about and for domestic and civic spaces: the communal and transitional rooms within residences, the atriums and courtyards of public community centers and libraries, and the meeting chambers of municipal buildings. Ubietous information experiences developed for these set-

Image 1: A 3D render of the Cybersyn operations room. **Credit**: Rama (Wikimedia Commons).

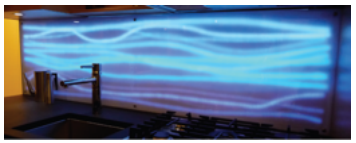

Image 2: Ambient visualization by Rodgers & Bartram [5] © 2010 CEUR / *Graphics Interface*.

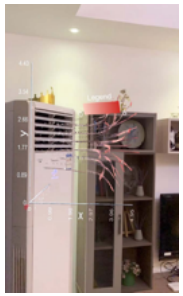

Image 3: Site-specific AR visualization with VisTellAR [6]. © 2025 IEEE.

tings are distinct from visions of ubiquitous analytics for mission control rooms, warehouses, and factory floors: workspaces replete with screens, dashboards, and workstations. While ubiquitous analytics could be characterized as a coordination between digital displays and wearable devices, the integration of data visualization into interior design considerations for domestic and civic spaces is likely to involve fewer screens, or at least smaller displays that do not draw as much focused attention from those occupying or passing through a space.

I will ground this discussion in several concrete points in a possible design space. First, I begin in the 1970s, with the planned but never fully-realized meeting rooms of Chile's *Project Cybersyn* [2, 3, 4], wherein a small set of custom chairs are arranged in such a way so as to encourage data-grounded discussion between policy makers (Image 1), and each chair is augmented with armrest controls for updating projections on peripheral wall panels, revealing glanceable contextually-relevant information to complement the conversation. Second, the 2010 work of Rodgers and Bartram [5] is helpful not only for its use of patterned room lighting to represent domestic resource consumption (Image 2), but also in their characterization of the work as an instance of *ambient visualization*, evoking early ambient music's associations with the places in which they are heard. Finally, Tong et al's 2025 demonstration of site-specific augmented reality visualization for asynchronous data storytelling [6] suggests new opportunities for integrating considerations for AR visualization into interior design.

I hope this discussion elicits new ideas for collaborations focusing on the coordination of information displays with the orientation and material properties of furnishings, with the dynamics of light and shadow falling on surfaces, and with the dynamics of multi-purpose domestic and civic spaces.

Discussion

1. How can data visualization reflect a sense of place?

2. How can a room's ambient light or shadow encode data?

3. In what ways can furniture display data and / or afford interactions with visual representations of data?

4. In what ways could common interior spaces be redesigned to accommodate situated visualization?

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