**CENTENNIAL CHROMAGRAPh**

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*Centennial Chromagraph* is a life-size representation of the history of the University of Minnesota School of Architecture, constructed as a spatial centerpiece for the school’s Centennial celebration. The project is an exercise in *data spatialization*: using computational design tools to generate formal and spatial constructions with large quantities of data—in this case, information collected over the school’s 100-year history. It explores an alternative approach to the contemporary paradigm of Big Data within design practice; one in which the powerful quantitative techniques of computation is leveraged to reveal new qualitative, aesthetic, spatial, and communicative possibilities for architecture. In doing so, *Centennial Chromagraph* questions the medium of the architectural installation by embracing an aesthetic tension between didactic representation and atmospheric experience, both conveying information as a timeline and producing abstract effects of light and color. In this regard, *Centennial Chromagraph* resists either quantitative or qualitative readings and instead oscillates between the two.
The installation consists of 100 robotically routed plywood ribs, joined with 8,080 colorful #2 pencils. The curvature of the ribs expresses major historical eras and periods of the school, while the color of the pencils reflects the changing composition of the school’s degree programs over its first century.

The design process began with a mapping analysis of the school’s alumni archives. Computational design software and techniques gleaned from contemporary approaches to “Big Data” were employed to visualize this information, in relation to class sizes, degree types, and geographic locations of the school’s graduates through time. The data mapping yielded two primary design strategies: spatial and chromatic. First, the installation’s curved form is derived from broad ranges from the school’s history: the tenures of its leadership, the buildings it has occupied, and the colleges it has belonged to. This information, chronologically mapped and diagrammatically abstracted through superimposed curves, drives the overall form of the installation. Second, a more granular data set of degrees granted by the school drives the distribution of color throughout the installation. The chromatic logic allows one to read the evolution of the School’s degree programs through time.

The pencils, colored according to each of the different degrees granted by the school over the past 100 years, become the medium through which the logic of data is overlaid onto the logic of assembly. Their granular resolution enables a calibrated sequence of scalar readings: the installation as sculptural object, the localized swells representing significant moments in the school’s history, the global color gradient that represents the evolution of the school’s programs over time, the dissolution of this gradient into an abstract field of color, and the final understanding of the single pencil as structural joint.
In its multiplicity of representational and abstract perceptual readings, *Centennial Chromagraph* demonstrates an approach to computational design—so frequently utilized in contemporary architecture for either strictly quantitative applications or purely qualitative exercises in formal exuberance—that synthetically balances data-driven techniques with experiential effects. It also suggests a new model for integrating computation into architectural design, whereby the artifacts of the algorithm—the subtle gradation of color, the deletion of pencils that would otherwise collide, the slight meander of the pencil holes along the rib—contribute to an emergent sense of craft. This sensibility is rooted in computational processes, yet it transcends the purely digital by interfacing directly with longstanding architectural notions of detail, ornament, pattern, and effect.

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