Centennial Chromograph

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Centennial Chromagraph is a life-size representation of the history of the University of Minnesota School of Architecture. 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. Centennial Chromagraph, constructed as a centerpiece for the School's Centennial celebration, 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 roboticallyrouted plywood ribs, joined together 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 was employed to visualize this data, 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 installation's overall form. 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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LOGIC OF DATA / LOGIC OF ASSEMBLY The choice of No. 2 pencils as the primary material and means of assembly draws upon the obvious iconography of the pencil as a drawing implement, as well as their relative economy and ease of reuse The apencils are imprinted with the centennial loan and intended as exeruted accouncils cellumin





The elevational view of the project provides the most legible reading of the chromatic mapping of the School's alumni. Each of the 100 ribs represents a year between 1913 and 2013, and each vertice column of paperils expresses the exponentional distribution of degrees for the corresponding clarge.



All tabrication information and assembly instructions were output directly from the same model that was used throughout the design process. The integrated design/fabrication model included a custon







CENTENNIAL CHROMAGRAPH Data Spatialization and Adam Marcus, California College of the Arts

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