April 17–June 30, 2026
Keller Gallery at the Massachusetts Institute of Technology

Curated by Alexandros Haridis

BEYOND DATA-DRIVEN AESTHETICS

Digital Reconstruction and Public Communication of Aesthetic Systems in Architecture and the Applied Arts

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April 17–June 30, 2026 Keller Gallery

Curated by Alexandros Haridis
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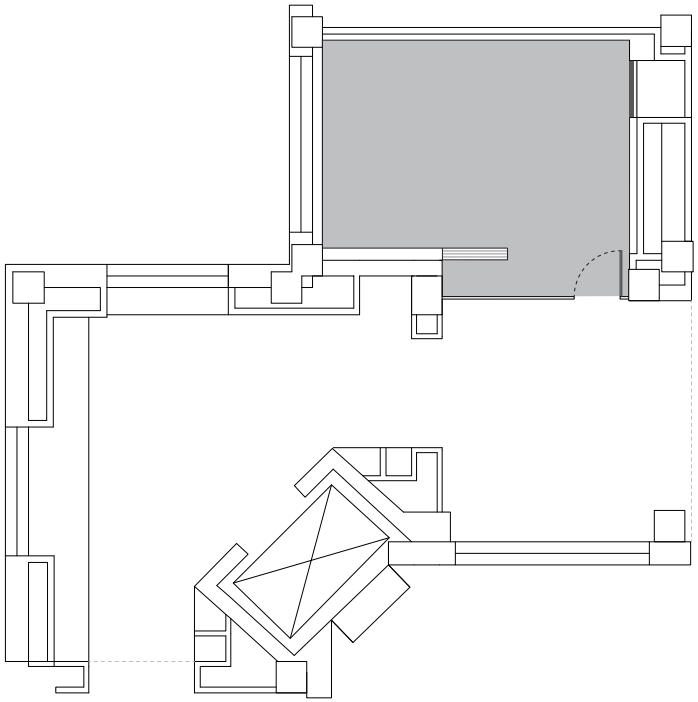

Level 0
Building 7, Room 7-404, Gallery and Hall

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Beyond Data-Driven Aesthetics

By Alexandros Haridis

At the 1956 Dartmouth Summer Research Project, creation and evaluation processes were identified as one of seven key dimensions of human intelligence that future AI research should address. Nearly seventy years later, computational systems increasingly participate in processes of aesthetic judgment, generation, and transformation across architecture, art, and design. Beyond Data-Driven Aesthetics examines 20th- and early 21st-century computational aesthetic systems in architecture and the applied arts that formalize processes of creation and evaluation beyond purely data-driven approaches.

Presented at the Keller Gallery at the Massachusetts Institute of Technology, the exhibition brings together work from academic and industry contexts across the United States and Europe that treats computing as a medium for addressing foundational questions of aesthetics, including how design and art are judged, generated, and transformed. Drawing from contemporary design methods and technology studies on software reconstruction, physical making, and data visualization, the exhibition translates select aesthetic systems from archival sources and academic literature into tangible and experiential formats. In doing so, it extends traditional modes of academic scholarship and public communication into spatial, visual, and material form.

The digital-physical artifacts in the exhibition are organized in space according to five thematic areas. Aesthetic Measure focuses on how the process of aesthetic judgment can be formalized mathematically and aesthetic value rendered measurable. The case study that represents this theme is George D. Birkhoff's *Aesthetic Measure* (1933). It uses physical reconstruction to make tangible principles of geometry, psychophysics, and early 20th-century theories of human perception particularly regarding how the complexity of a shape or visual form influences perceptual effort and attention.

Aesthetic Guidelines takes as its entry point the experiments of artists with computer technology in the 1950s and 1960s. Rather than pursuing a universally applicable theory of aesthetics, these experiments treated computing as a tool for the systematic and expansive exploration of generative processes that were previously manual and hand-guided. The case study that represents this theme is Vera Molnár and her writings on guidelines or procedures for the use of computers in the creative process. The exhibition reconstructs three of her artworks into a contemporary digital application through which visitors can experience what Molnár refers to as the "experimental method" for art-making and art-appreciation.

Algorithmic Aesthetics takes as its case study the pioneering work of George Stiny and James Gips in the 1970s and 1980s on shape grammars and their use for generative design and aesthetic evaluation in architecture and the visual arts. The primary emphasis is on showing a particular evaluation algorithm introduced in *Algorithmic Aesthetics: Computer Models for Criticism and Design in the Arts* (1978) that relates the evaluation of a work of design or art to the complexity of the instructions or rules required for generating it—an idea that ties back to the aesthetic canon of unity-amidst-variety and to algorithmic definitions of entropy.

Aesthetic Appropriation explores how aesthetic value arises from "copying" or appropriating existing works of art or design to create novel images or forms. The case study that represents this theme is Lillian F. Schwartz and her writings on "appropriation art" in the 1990s with the use of digital computers and her collaborations with engineers. It takes software reconstruction as a method of communicating Schwartz's approach to transforming the "idea" or "concept" (rather than explicitly the images) behind an existing work into a novel yet recognizable format, most often involving short digital films produced with early computer graphics.

Finally, Aesthetic Novelty focuses on how present-day data-driven machine learning approaches have attempted to formulate aesthetic judgment computationally. It takes as its case study AICAN (2017), a Creative Adversarial Network, and by using contemporary data visualization and interpretability techniques it shows how the system's core computational components model a theory of aesthetic value that originates from cognitive aesthetics and advocates a balance of novelty and familiarity in design or art-making.

In addition to original physical sculptures, data visualizations, and software reconstructions created for the Keller Gallery, the exhibition also features selected archival items on loan from institutional and private collections. In particular, the themes Aesthetic Measure, Algorithmic Aesthetics, and Aesthetic Appropriation feature historically important and rare items on loan from the MIT Libraries, George Stiny's personal collection, and the Henry Ford Museum of American Innovation.

Each thematic area functions as a selective "window" into a distinct computational approach to aesthetic judgment in architecture and the applied arts, a question that has existed since the 1950s but has gained renewed urgency as design and art industries continue to grapple with recent advances in AI. From a research standpoint, the aesthetic systems on display trace a lineage from early taste-based theories of aesthetic judgment in the 17th and 18th centuries to 20th-century computational formalism and contemporary machine learning research. Beyond Data-Driven Aesthetics is both a research exhibition and an ongoing platform for investigating how computational systems participate in processes of aesthetic judgment, generation, and transformation across architecture, art, and design.

View from the gallery entrance door, with framed works and the exhibition's poster, MIT Keller Gallery, Cambridge 2026. *Photo*: Adrian Yu (2026).

TIMELINE OF AESTHETIC SYSTEMS

2026

Digital animation (wall projection)
Duration: 1 minute and 51 seconds

Diverse fields including philosophy, architecture, art and literary criticism, computer science, cognitive science, and mathematics have attempted to characterize human aesthetic experience through theoretical, practical, and computational approaches. Throughout the 20th century, aesthetic judgment received increasingly elaborate mathematical and computational treatments, influenced by theories of computability, digital information, and the broader rise of aesthetic formalism.

As visitors enter the exhibition, they encounter an animated infographic timeline that situates the five selected case studies within a broader historical trajectory of academic and industry research across the United States and Europe. The infographic is an excerpt from a larger database of aesthetic systems built over several years and includes published work from the 17th century to the early 21st century.

The horizontal timeline groups each entry according to disciplinary origin, such as art criticism or computer science, and according to its underlying theoretical or computational approaches, including psychophysics of form, shape grammars, and machine learning.

The timeline is presented as a wall-scale animated projection, while the database functions as an evolving platform open to future contributions from scholars and researchers investigating computation as a method for understanding and characterizing human aesthetic experience.

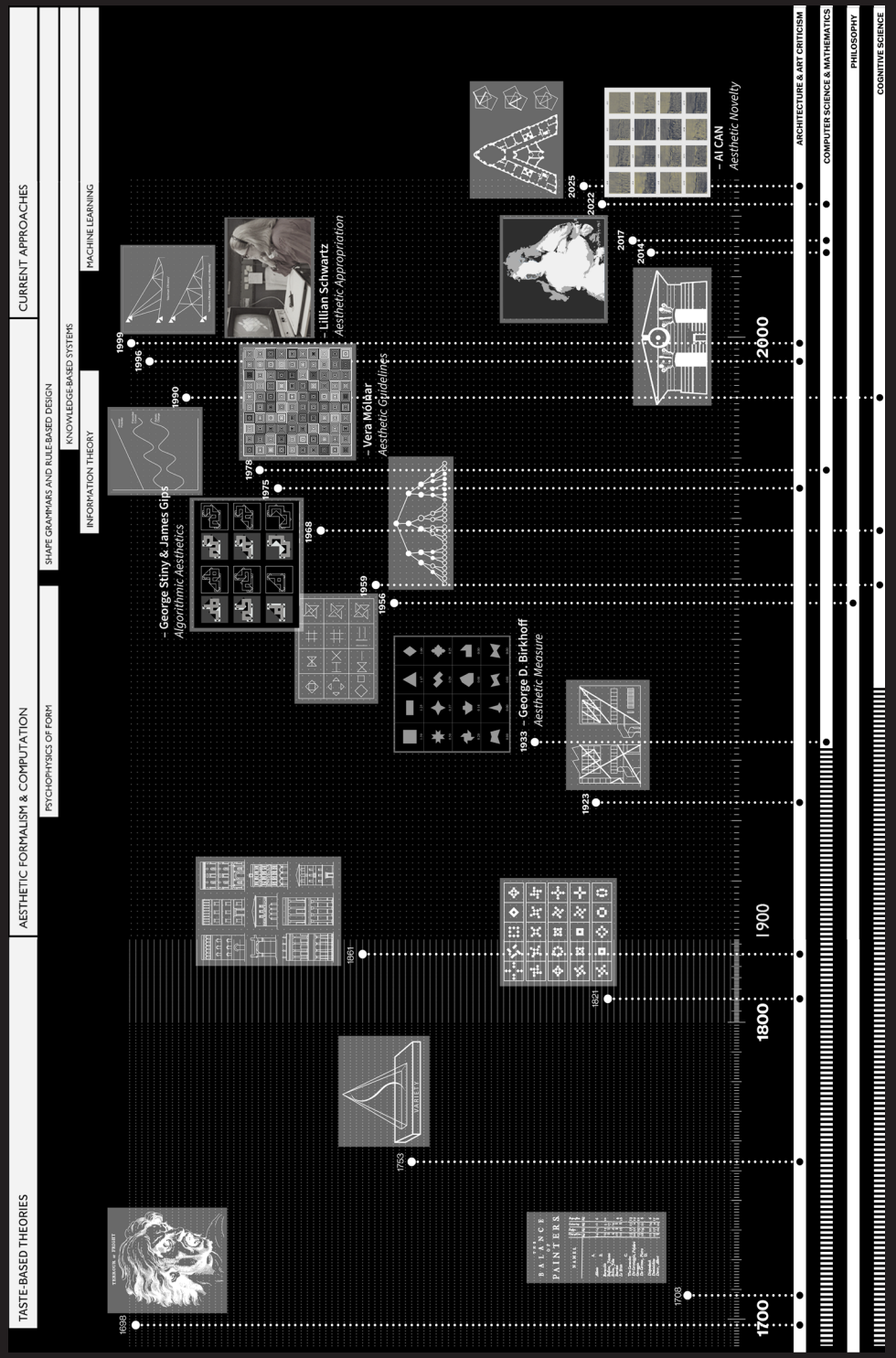

Fig. 1 — Excerpt from an interactive infographic timeline representing a database of 20th- and early 21st-century aesthetic systems in architecture and the applied arts, MIT Keller Gallery, Cambridge 2026. *Photo*: Beyond Data-Driven Aesthetics (2026).

Case Study 01

AESTHETIC MEASURE
George D. Birkhoff
1933

Layered foam core panels, spray-painted (pebble finish) (36” × 52”).
CNC-cut negative relief on the front layer

Motivated by a search for a definitive, mathematical account of aesthetic judgment, George D. Birkhoff develops a theory of aesthetic measure combining geometry and perceptual response.

This piece presents Birkhoff’s formulation for a specific class of objects, polygons, where aesthetic value is defined as the relationship between order and complexity in a polygon’s geometric elements. Complexity (C) corresponds to the viewer’s effort of attention, while order (O) produces a positive perceptual response. Aesthetic measure is thus expressed as a ratio O/C between these two quantities.

In philosophical aesthetics, Birkhoff’s approach belongs to property-based theories, in which value is understood to reside in the formal and geometric properties of an object itself, rather than its symbolic meaning or content.

On View

The sculpture presents a physical interpretation of the class of polygons from the book *Aesthetic Measure* (Harvard University Press, 1933). Its physical construction emphasizes the boundary lines of each polygon as a subtractive, negative relief. Through lighting and shadow, these boundaries become visually prominent, reflecting their central role in the calculation of Birkhoff’s complexity index.

Also on display is an original archival copy of Aesthetic Measure presented in a glass case on loan from the MIT Libraries.

Fig. 2 — Visitors interacting with a physical wall-mounted sculpture, reconstructing the class of polygons from *Aesthetic Measure* (1933) by George D. Birkhoff in a tangible form. *Photo*: Adrian Yu (2026).

AESTHETIC GUIDELINES
Vera Molnár
1950s–1960s

Six prints, framed (8” × 8”)
Digital tablet with custom implementations of three works by Vera Molnár developed for this installation

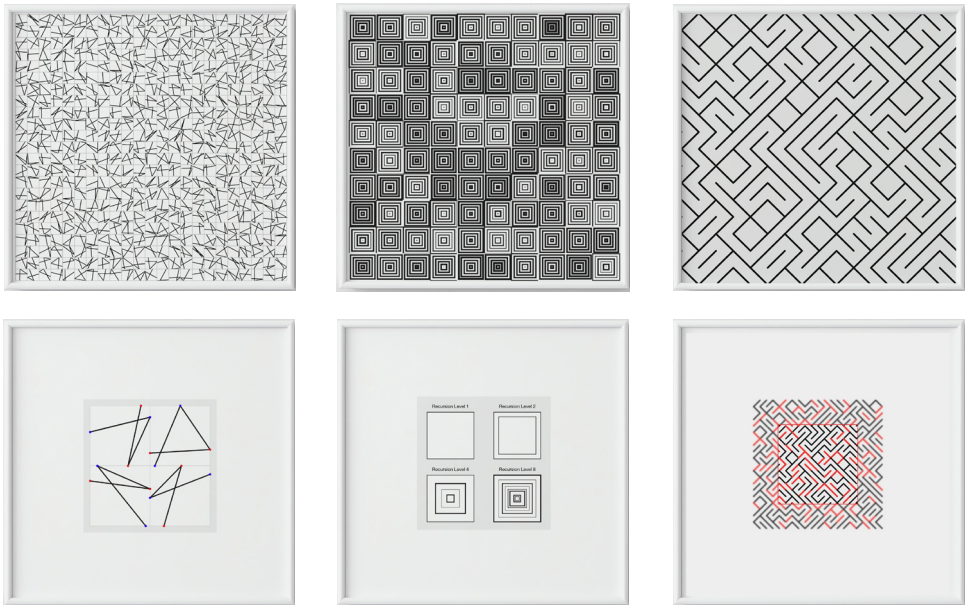

Fig. 3 — Six physical prints, framed, derived from algorithmic implementations of three of Molnár’s works. Each work is paired with its underlying procedure or guidelines. *Photo*: Beyond Data-Driven Aesthetics (2026)

This piece investigates how new works of art and design can emerge through procedures in which simple geometric shapes are successively altered into more elaborate arrangements—by hand or with the aid of digital computers. It takes as its case study the work of Vera Molnár, reconstructing procedures that generate non-representational geometric patterns.

In her article, “Toward Aesthetic Guidelines for Paintings with the Aid of a Computer” (*Leonardo*, 1975), Molnár describes these procedures as computer-aided “guidelines”: step-by-step heuristics that can be translated into code but also executed manually. Unlike later formal approaches to computational aesthetics, guidelines are iterative and experimental, developing through active attention and engagement with the work as it develops rather than from an overarching formal theory.

On View

A digital tablet presents a custom application for experimenting with guidelines derived from three works by Molnár: *(Dés)Ordres ((Dis) Orders)* (1974), *Quatre éléments distribués au hasard* (1950), *Signes sans Signification B* (1975). Each implementation guides users through a sequence of operations that generates variations of a pattern.

Also on display are selected frames from each work, paired with prints of their underlying procedures. Each frame communicates the basic guidelines that can generate near-infinite variations of the same pattern or motif, including the three that were selected to be placed on display in the gallery. Visitors interacting with the digital tablet can experience the “experimental method” for art-making and art-appreciation that Molnár describes in her writings.

Fig. 4 — User interface of a custom application implementing three works by Molnár: *(Dés)Ordres ((Dis) Orders)* (1974), *Quatre éléments distribués au hasard* (1950), *Signes sans Signification B* (1975). *Photo*: Yaluo Wang (2026).

Case Study 03

ALGORITHMIC AESTHETICS
George Stiny and James Gips
1978

Color paper cutouts mounted on six foam core boards (16” × 16”)
Six transparent acrylic panels with scored surfaces (16” × 16”)

On loan from the personal collection of George Stiny:
Cylindrical Additions to Froebel’s Building Gifts (c 1980)
Machined aluminum cylindrical modules

Shortly after the invention of the Shape Grammar formalism, George Stiny and James Gips introduced *Algorithmic Aesthetics* (University of California Press, 1978), a study on how design and evaluation can be formulated algorithmically. *Algorithmic Aesthetics* emerged from developments in computability theory, digital information, and broader 1970s debates on whether art and design should be included within the newly founded field of AI.

Its primary computational artifact is the Ez evaluation algorithm, which evaluates a work of art or design by correlating its description with the length of the shape grammar that generates it. Ez was implemented by James Gips in SAIL and executed on a PDP-10 mainframe at the Stanford Artificial Intelligence Laboratory.

On View

The physical sculpture on display is derived from the evaluation process of the *Anamorphism I–VI* series of geometric paintings. The acrylic surfaces, positioned over the paintings, represent the method by which Ez calculates constructive complexity by analyzing the boundary lines of color planes.

Also on display is *Cylindrical Additions to Froebel’s Building Gifts* (c 1980) on loan from George Stiny’s personal collection. Designed to extend Friedrich Fröebel’s original building gifts, the cylindrical elements expand the creative possibilities of the set while enriching the forms of “knowledge,” “life,” and “beauty”—Fröebel’s heuristic categories for creation and evaluation.

Fig. 5 — Physical sculpture reconstructing the evaluation process of the *Anamorphism I–VI* series of geometric paintings documented in *Algorithmic Aesthetics* (1978). *Photo*: Adrian Yu (2026).

Case Study 04

AESTHETIC APPROPRIATION
Lillian F. Schwartz
1993–1995

Color video monitor (14" × 24" screen), digital reconstruction based on Leonardo Morphed to Mona Lisa (c 1993) and Mona-Leo (c 1995)
Duration: 1 minute and 51 seconds

On loan from the Henry Ford Museum of American Innovation:
Homage to Duchamp (Nude Ascending Staircase) (c 1975)
Etching (print), framed in black and gold

Prototype Cover Design for The Computer Art Book (c 1992)
Paper print for Leonardo journal (MIT Press)

In the late 1960s, initiatives such as Experiments in Art and Technology (EAT), aimed to foster collaborations between artists and engineers. Within this context, Lillian F. Schwartz joined Bell Laboratories to advance her artistic practice through computing technology. This piece explores image and identity transformation through early digital image processing algorithms. It focuses on how aesthetic value can emerge by appropriating existing images of artworks into novel yet recognizable forms.

On View

This piece includes two original works by Lillian Schwartz on loan from the Henry Ford Museum of American Innovation: *Homage to Duchamp (Nude Ascending Staircase)* (c 1975), by Lillian Schwartz with Robert J. Tatem, appropriates Duchamp's idea that a specific placement of images in two dimensions suggests motion. Schwartz adapted a program originally developed for drawing integrated circuits to generate triangular forms arranged to represent motion. The framed painting shows a single static frame from a work initially conceived as a film.

Also on display is the *Prototype Cover Design for 'The Computer Art Book'* (c 1992), by Lillian Schwartz and Laurens R. Schwartz. The cover design and the video monitor on display draw from Schwartz's "Mona-Leo" studies. Computer-aided morphing algorithms explore the transformation of Isabella, Duchess of Aragon, into the celebrated Mona Lisa (c. 1503–1506), a process often associated with Da Vinci's own facial features.

Fig. 6 — Two original works by Lillian F. Schwartz on loan from the Henry Ford Museum of American Innovation and a video monitor with a digital reconstruction of Schwartz's "Mona-Leo" studies. *Photo*: Adrian Yu (2026).

Case Study 05

AESTHETIC NOVELTY
AICAN
2017

Two color video monitors (14" × 24" screen)
Duration: 2 minutes and 23 seconds (left), 6 minutes and 18 seconds (right)
Training data derived from the WikiArt dataset
Custom CAN implementation developed for this installation

This piece examines early 21st-century data-driven approaches to art and design that have entered both public discourse and high-profile art auctions. It focuses on Creative Adversarial Networks (AICAN), developed by Ahmed Elgammal and collaborators, using software reconstruction and AI interpretability techniques.

Unlike conventional Generative Adversarial Networks, AICAN is trained not only to recognize and emulate a training set but also to deviate from it, producing art-like images while resisting clear stylistic classification. It does so by modeling a theory of aesthetic judgment drawn from the work of Colin Martindale and Daniel Berlyne in cognitive aesthetics: while artists seek to create novelty by departing from familiar forms and styles, excessive deviation may estrange viewers.

On View

A two-screen animated data visualization interprets AICAN's generative and discriminative processes. Trained on the WikiArt dataset, it uses feature visualization and dimensionality reduction techniques to interpret the model's decisions in image generation and aesthetic judgment. The left screen visualizes the interaction between the Generator and Discriminator, AICAN's two core computational components.

The right screen visualizes the generative process itself, tracing how an image develops across 100 training epochs sampled at ten-step intervals. Feature maps reveal how the network progressively decomposes and re-synthesizes visual organization into painterly textures, depth, and tonal variation.

Fig. 7 — Two-screen animated data visualization interpreting AICAN, a machine learning system for art generation and evaluation, MIT Keller Gallery, Cambridge 2026. *Photo*: Beyond Data-Driven Aesthetics (2026).

Exhibition view, MIT Keller Gallery, Cambridge 2026. *Photo*: Adrian Yu (2026).

Exhibition view from the entrance to the gallery, MIT Keller Gallery, Cambridge 2026. *Photo*: Adrian Yu (2026).

Detail of a laser-cut acrylic panel mounted on a reconstruction of the *Anamorphism I–VI* (c 1978) paintings by George Stiny and James Gips, MIT Keller Gallery, Cambridge 2026. *Photo*: Adrian Yu (2026).

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Exhibition Advisory
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Joél Carela

Production
Case Study 1 – Aesthetic Measure
Design assistant: Adrian Yu
Archival items: Loan from the MIT Libraries

Case Study 2 – Aesthetic Guidelines
Computational interaction: Yaluo Wang
Contribution to algorithmic design: Chloe Choi

Case Study 3 – Algorithmic Aesthetics
Design assistant: Adrian Yu
Archival items: Loan from the personal collection of George Stiny

Case Study 4 – Aesthetic Appropriation
Computational interaction: Yaluo Wang
Archival items: Loan from the Henry Ford Museum of American Innovation

Case Study 5 – Aesthetic Novelty
Design engineering: Jingfei Huang, Riddhi Kasar, Sherrie Shou
Machine learning: Jimmy Wei-Chun Cheng

Installation and Fabrication
Blue Chan, Nathaniel Chavez-Baumberg, Maciej Dzumala
GPI Models

Website Development
Samuel Grunebaum, Jake Tan

Photography
Adrian Yu, Qingyang Xie

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Henry Ford Museum of American Innovation
George Stiny
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Sam Brady-Myerov
Harvard GSD Exhibitions

Media and Further Documentation
Find more documentation, news, and related materials for
this exhibition on aestheticsbeyonddata.com:

Acknowledgments

Beyond Data-Driven Aesthetics: Digital Reconstruction and Public Communication of Aesthetic Systems in Architecture and the Applied Arts is a research exhibition conceived and curated by Alexandros Haridis for the Keller Gallery at the Massachusetts Institute of Technology.

The exhibition draws from several years of research by the curator and represents a translation of traditional modes of research scholarship and communication into spatial, tangible, and experiential formats. The project's primary documentation platform is its official website (aestheticsbeyonddata.com), which contains additional texts, materials, and documentation related to this research project, including coverage of the exhibition in the form of a short research film produced by MIT Video Productions.

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Alexandros Haridis
Cambridge, USA
2026

Exhibition view from the entrance to the gallery, MIT Keller Gallery, Cambridge 2026. *Photo*: Qingyang Xie (2026).

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