Nudging Creativity in Typography with Font Pairing Prompts

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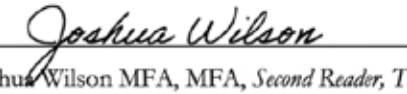

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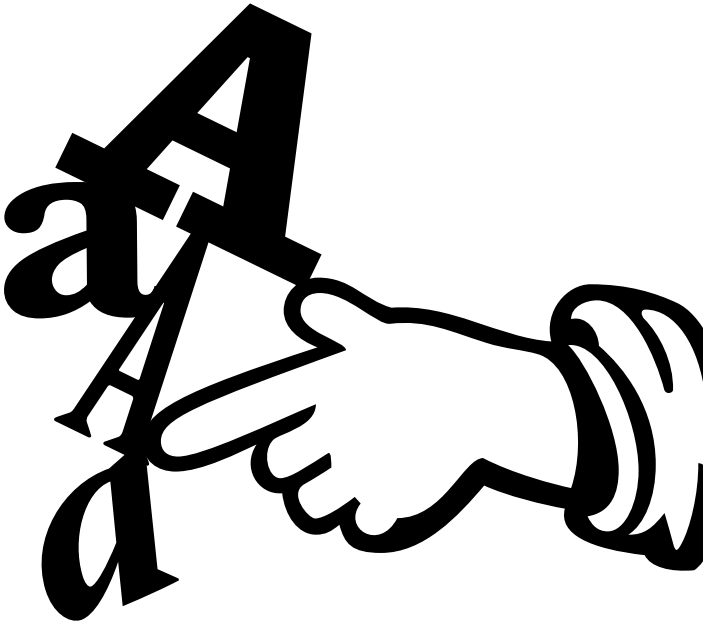
CHAPTER 1



CHAPTER 2

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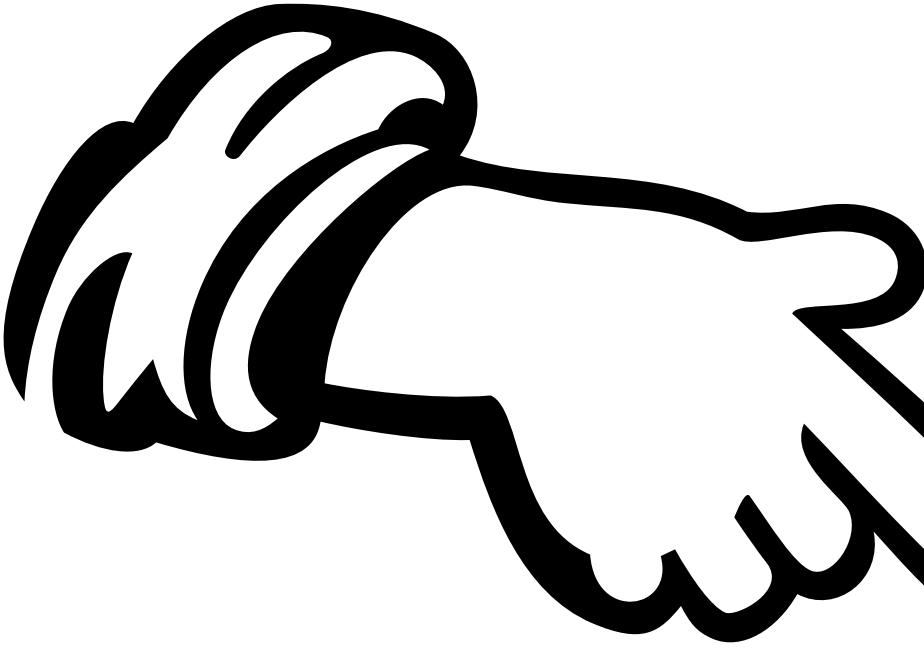


CHAPTER 1

Objectives

KnowledgeGap

Significance

A. Research Problem

Graphic designers grapple with an overwhelming abundance of font options in the digital marketplace. This can have several consequences, including difficulty creating innovative typographic pairings, a tendency to rely on familiar choices, and limited exposure to diverse type foundries.

B. Objectives

Effective use and pairing of fonts is a mark of acclaimed design work, and the emotional impact of visual communication is predicated on the informed use of fonts together with color, materials, and images. I have noticed that my students struggle to use and pair fonts in an informed and purposeful way. This thesis project will attempt to overcome difficulties in font use and pairing by creating a prompt-based website that enables a designer to use and pair fonts creatively. The font pairings suggested by the prompts are random, so the designer doesn't choose the pair; rather, the prompt forces them to creatively problem-solve, finding a graphic design solution for fonts that may be unconventional pairings, or even present a conflict or other issues. The benefit of this is to enhance creative problem-solving skills by forcing the designer to "make" a font pairing work, building a deeper understanding of all the variables of fonts and learning how they can work well together. Such randomized prompts build skills through creative problem-solving, teaching designers about the nuances of fonts and how to use and pair them effectively.

C. Research Question

How might the use of prompts foster more creative and diverse font use for graphic design applications?

D. Knowledge Gap

There are several knowledge gaps to consider. The font schemas currently adopted in application user interfaces are not conducive to font pairing because they fail to take account of the diverse functions of typography. The discipline of graphic design has a contradictory stance on the role of typography in its practice, which explains the limited theoretical schemas to organize typography. AI tools can help designers to foster divergent thinking processes, but not to judge possible solutions according to various factors or criteria, which is what makes designers economically valuable in the marketplace.

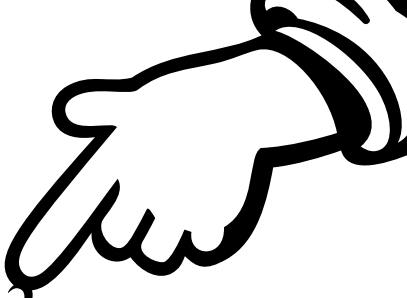
E. Significance

There are two primary stakeholders for this thesis: the makers of fonts and the users of fonts—more specifically, graphic design students, who are the intended users for this thesis. Graphic designers are under pressure to generate utility value for clients above and beyond what AI services and products can provide. It is likely that AI will raise the threshold for economic viability when it comes to hiring graphic designers, so the economic value generated by surprise creativity will become an important factor for graphic designers.

Type design, meanwhile, is dominated by large marketplaces and intermediaries. Type designers trying to find marketplace fit for their fonts are hindered by the large number of fonts available on platforms, combined with suboptimal search capabilities. Intermediaries (including Adobe, Monotype, I Love Typography, Type Network, Fonts in Use, The League of Moveable Type, and Tiny, owner of Dribbble and Creative Market) that provide fonts to users, connecting our two primary stakeholders, could benefit from the proposed intervention.

More effective, diverse, and creative font pairings could provide a method for ideation that outperforms AI-generated design work while also

providing opportunity for smaller, less established type designers and foundries to build their user base.



CHAPTER 2

Rationale

Methods

Findings

A. Research Rationale

Graphic designers grapple with the overwhelming abundance of font options in the digital marketplace. This abundance of fonts leads to difficulty in creating innovative typographic pairings, a tendency to rely on familiar choices, and limited exposure to diverse type foundries.

B. Research Methods

This chapter comprises three sections. The first is a literature review that considers three sub-topics: the technological development of typography, the integration of typography into graphic design, and users' search habits in response to digital abundance. Following the literature review there is a review of three case studies, then three visual analyses related to prompt generation and ideation.

i. Case Studies

The Eephus League Case Study (Bethany Heck, 2010)

The purpose of the research is to better understand how Heck creates diverse font pairings. The analysis informs the formal and logical parameters that create diverse font pairings. The five questions answered by my analysis are:

1. How does she decide when to use fonts?
2. How does she consider layout, color, and image in relation to her type choices?
3. When does she use a different font weight or width?
4. When does she use a completely different font?
5. What is her method for choosing diverse and surprising fonts?

TypeCooker (Erik van Blokland, 2004), https://typecooker.com/

The purpose of the research is to better understand the pedagogical logic behind Blokland's TypeCooker prompt website. The analysis informs my understanding of how a typography prompt system is structured and presented to end users. The five questions answered by my analysis are:

6. How did Blokland organize the progressive logic of the prompts?
7. What was Blokland's motivation for making the prompt generator?
8. What pedagogical consequences did Blokland expect from students using the tool?
9. How did Blokland design the prompt generation backend?
10. How effective has this prompt system been in letterform ideation?

KernType: A Letter Spacing Game (Mark MacKay, 2011), https://type.method.ac/

The purpose of the research is to better understand how website interfaces can aid in typography pedagogy. The analysis informs how I will design the user interface of my prompt website. In particular, I am interested in exploring what typography parameters can be elucidated by a user interface without human support or feedback. The five questions answered by my analysis are:

11. How did MacKay structure the website to provide feedback to the user?
12. What parameters does this site test regarding typography?
13. How does the design of the site promote type foundries?
14. How do users interact with the interface?
15. What are the pedagogical consequences of this interface?

ii. Visual Analysis

The Eephus League Case Study (Bethany Heck, 2010)

The purpose of the research is to better understand how Heck creates diverse font pairings. The analysis informs the formal and logical parameters that create diverse font pairings. The five questions answered by my analysis are:

16. How does she decide when to use fonts?
17. How does she consider layout, color, and image in relation to her type choices?
18. When does she use a different font weight or width?
19. When does she use a completely different font?
20. What is her method for choosing diverse and surprising fonts?

TypeCooker (Erik van Blokland, 2004), https://typecooker.com/

The purpose of the research is to better understand the pedagogical logic behind Blokland's TypeCooker prompt website. The analysis informs my understanding of how a typography prompt system is structured and presented to end users. The five questions answered by my analysis are:

21. How did Blokland organize the progressive logic of the prompts?
22. What parameters did he specify for the "beginner" level?
23. What parameters did he specify for the "pro" level?
24. How did Blokland design the prompt generation backend?
25. How effective has this prompt system been in letterform ideation?

Sharpen (Arman Nobari and Anthony Gibson, 2017), https://sharpen.design/

The purpose of the research is to better understand how graphic design prompts can be presented to users over the internet. The analysis informs the way general graphic design parameters can interact with typographic parameters, including both tensions and agreements. The five questions

answered by my analysis are:

26. How did Nobari and Gibson design the user interface?
27. What parameters are presented to the user for prompts?
28. How can I integrate general graphic design parameters with typography parameters?
29. How do users interact with the prompt? What do they produce?
30. How does the newsletter interact with the prompt generator?

c. Summary of Findings

Defining Typography and Fonts

Typography is the art of selecting, setting, and adjusting letterforms to achieve various functions within various parameters (Bringhurst 18). Letterforms are the physical presentation of a figure that signifies a linguistic element (Bringhurst 300). A font is a set of token letterform presentations (Bringhurst 337). This physical presentation of the linguistic element is affected by the technologies used to produce and distribute that presentation (Bringhurst 339). As a physical entity, a font was a set of glyphs of a specific height, width, and depth produced from a matrix (Bringhurst 341). These glyphs would be set into linear arrangements called measures (Bringhurst 337). The set of measures would be assembled into a text block by the printer, fixed in place, inked, and a material like paper or parchment impressed onto the glyphs. The impression would transfer from the inked glyphs to the material (Bringhurst 119). "Typography" is derived from typos, impression, and graphia, indicating a technique for producing representations.

A font family contains a number of fonts differentiated by various parameters such as weight, italic vs. roman, width, optical size, grade, and

more (Bringhurst 55, 190). A font family might contain as few as two or as many as a hundred or more fonts within the set. The concept of a font family is a historical development (Bringhurst 103); prior to the twentieth century, fonts were not commonly organized into an intentionally conceived logical relationship based on parameters (Bringhurst 140). The mixing of various letterform styles and widths was idiosyncratic and without a coherent naming scheme (Meggs 153). This is in contrast to later font families such as Univers, which would present to designers and printers a complete, rational system. Instead of categorical names such as "light," "heavy," "wide," and "narrow," fonts in the Univers family were designated by numerals to articulate the various weights and widths available to the designer (Meggs 400).

When fonts were produced by hand by punch cutters, letterforms were adjusted according to the intended size of the glyph (Bringhurst 182). These changes were particular to the individual punch cutter or type foundry, and not standardized into the kind of rational system we would expect today (Smeijers 53). The physical weight of metal type imposed geographic limitations on production and distribution, so fonts were particular to a region or artisan (Bringhurst 141), and the typography of a particular time and place was identifiable by the punch cutters and printers then active in the region (Smeijers 54).

The spread of typography across all of Europe, everywhere from England to Poland, was achieved within a rapid timeframe—about forty years (Carter). For context, the development of the internet from a government program to commercial viability was also within a forty-year span. The process of producing type started to change with the standardization and automation of glyph casting that occurred with the Linotype and Monotype machines in the 1890s. A technician would type the manuscript of a text on a keyboard, and

the Monotype or Linotype machine would produce the glyphs from supplied matrices (Bringhurst 137). Before the "hot" casting processes of the Linotype and Monotype machines, type foundries had to ship completed sets of heavy metal glyphs to printers. With photo-composition in the 1960s began the virtualization of fonts, as the matrices that had produced physical metal type were replaced by film negatives of glyphs exposed to light-sensitive paper, producing the typographic end result with less space and weight (Bringhurst 139). Over a period of less than eighty years, fonts rapidly transformed from physical metal objects to objects of light.

The dematerialization of fonts that started with photo-composition was completed with the introduction of digital technologies for the production and distribution of fonts. The digital encoding of glyph outline paths and set-width data was produced with software such as Ikarus, Fontographer, RoboFog, FontLab—and most recently, Glyphs and RoboFont (Bringhurst 186–88). The encoding of glyph sets into the correct keyboard assignments, as well as font family organization by weight, width, and other variations was standardized with the introduction of Unicode for text encoding and OpenType for scalable computer fonts. Adobe's Postscript page description language and the release of the Macintosh personal computer spurred the acceleration of desktop publishing in the 1980s and 1990s (Bringhurst 182). Designers in New York and California explored the creative and professional potential of the computer to produce effective visual communication and graphic design (Meggs 573).

Before the internet, even as the process of making fonts became digital, there were bottlenecks in font distribution; mailing of floppy disks and other physical media was normal for the design process at this time. Designers worked with digital font foundries that would print out high-resolution

typesetting in a particular digital font, then mail the camera-ready output to the designer to be pasted up and photographed (VanderLans 25).

While the distribution of fonts was bottlenecked with analog limitations during the 1980s, the meaning of typography expanded to include disciplines such as lettering, the creation of letterforms for a particular application. A bespoke logotype resulting from the adjustment of an existing typeface, for example, is a case where the categories of typography and lettering overlap (Smeijers 19). Such adjustments were made much easier by vector graphics editors like Adobe Illustrator and font editors.

From the 1990s on, advancements in digital communication—the internet, personal digital devices like the iPhone—continued to shape typography (Meggs 595). Because of their small file size, fonts could now easily be transferred over the internet for distribution (Meggs 593), and personal digital devices such as the iPhone resulted in more text being presented to users on screens rather than in print. Also, the new paradigm of HTML and CSS resulted for the first time in a divorce between informational content and its physical presentation; the same content could be presented in different fonts, colors, or position by changing the linked CSS stylesheet (MDN, "CSS"). At first, fonts were limited to the "web safe" fonts known to be pre-installed on the majority of personal computers. This limitation was alleviated with the introduction of the @font-face property in CSS, which allowed for fonts on a server to be presented to the user of a webpage even if the font wasn't installed on their computer. In addition, the responsive web design paradigm introduced the use of relative unit values and media queries of viewports, allowing a website to respond to the different devices—e.g. phone, laptop, or television screen—on which a webpage might be presented (MDN, "CSS"). These innovations resulted in the outgrowth of professions such as product design founded on the discipline of Human-Computer Interactions (HCI)

and brand design founded from marketing and advertising disciplines, along with a broader understanding of the professional activities of the graphic designer.

The Number of Fonts Available to Users

The quantity of fonts available to users is tied to the distribution platform available to type designers, which is prone to periods of consolidation—from 1802, when Philadelphia's Binny & Ronaldson was still the only domestic type manufacturer in the United States (LaRossa), to the creation in 1892 of the American Type Foundry (ATF) from the merger of 23 separate foundries, representing 85% of type production in the US. More recently, Monotype has acquired various digital type foundries such as Bitstream, Sharp Type, Hoefler & Co., FontShop, Fontworks, URW Type Foundry, and others over the last decade ("Monotype Acquires").

While periods of consolidation affect the availability of fonts to end users, the total quantity of fonts available to users tended to fluctuate around several thousand for the Latin-script market. The complete 1922 Monotype catalog, for example, is 718 pages long, with an estimated 2,000 font families available in various sizes and styles (Williams). In 1965, Photo-Lettering Inc., the most successful photocomposition service, offered 5,474 typefaces in a 970-page catalog (Devroye). While there is no official record of how many digital fonts exist for use online today, some estimate the number to be over a million—1,124,402 individual fonts as of September 2024, according to whatfontis.com, a website that scrapes the web to include open-source, private, and commercial fonts available for use. As of September 2024, Adobe Fonts (formerly Typekit) provides 4,424 font families to users of the Adobe Creative Cloud platform., and Google Fonts offers 1,716 open-source font families to users.

Best Practices in Management of Excessive Font Quantity

To manage the abundance of fonts users encounter in catalogs and user interfaces, font distributors organize fonts first by trademark font family names, followed by meta-categories organized around trade taxonomies or function (Bringhurst 121). The trade taxonomies are generally Latin type–centric, with a sans/serif distinction, as well as other trade sub-categories such as "modern," "old style," and "gothic," or functional categories including "title," "outline," "shaded," "text," "typewriter," and "mailing lists," as in the 1922 Monotype catalog. The Google Fonts user interface for font search is more restrictive, with options for writing system and language support/coverage, variable font or color font support, classification based on "stroke decoration" for serif, slab, and sans serif, and functional classifications like "display," "handwriting," "monospace," and "not text." A final slider is presented to the user to select the number of styles the font family needs to include, from 1 style to a maximum of 18. Adobe Fonts follows a similar format, with language and writing system coverage and font technology support, but with more extensive search criteria based on classification and properties. The Classification section of the UI has six labels: "sans serif," "serif," "slab serif," "script," "mono," and "hand." The Properties section has a slider UI for the number of styles in a font family, from 1 to 25+, but it also presents users with options to select font variables such as weight, width, x-height, contrast, italics, mixed case or capitals only, single/double-story lowercase a, and figures style.

Difficulty in Creating Innovative Typographic Pairings

While the user interfaces of digital type foundries appear effective, there is a lack of empirical evidence that these UIs and methods of organizing fonts are beneficial to users (Bringhurst 121). The limited subjective research available on using these interfaces shows persistent difficulties connected to the abundance of fonts available and a disconnect between the trade

and technical vocabulary for typography. When asked to rank aspects of typography based on difficulty, the majority of communication design students surveyed found typeface selection and pairing the most difficult, due to the overwhelming amount of choices available (Beane). Within the human-computer interaction (HCI) domain, users also report difficulty using Google Fonts to find and select fonts to match functional and personality objectives (Wu et al.). Although more research and study is required, we can see from these limited subjective surveys that font pairing has not been addressed effectively by industry best practices. There remains a disconnect between the emotional affordances of visual communication and creative font pairings. In an interview, designer Bethany Heck outlined the motivation for her Font Review Journal site to provide educational frameworks for more creative use of typography in graphic design. She reflects on her font pairing practices related to the function and narrative voice of various fonts (Hogrebe). Heck's observations are reasonable; there are issues with the integration of typography into graphic design practice and pedagogy (LaRossa).

Incorporation of Typography into Graphic Design & its Consequences

There are various proposed origins for graphic design as a discipline, but the Bauhaus is commonly referenced as an important touchpoint in graphic design pedagogy (Chen and He). The Bauhaus was an applied arts educational institution in Germany between 1919 and 1933. Offering courses in painting, product design, and photography, the Bauhaus combined Dewey's constructionist pedagogical theory with the aesthetics of German idealism (Kapsreiter). Influenced by the kindergarten movement of the nineteenth century, Bauhaus pedagogy explored the importance of simplicity of shape independent of contextual cultural norms (Lupton and Miller). The school charter, penned by Bauhaus founder Gropius, unified the motivations behind

the Arts and Crafts movement and the idea of integrating the artist into the industrial age (Lupton and Miller). In order to achieve this unity, the Bauhaus curriculum's "basic course" was designed as a general introduction to composition, color, materials, and three-dimensional form considered foundational to all disciplines. These abstract universals were thought of as a language of vision that was applicable to all crafts and arts (Lupton and Miller). Kandinsky presented the claim of arts to be the spiritual grounding for modern man (Kandinsky). Many in the Bauhaus circle, including Jan Tschichold, Herbert Bayer, and László Moholy-Nagy, would go on to be prominent in graphic design. Tschichold's *The New Typography*, which argued for a modernist interpretation of typography that responded to the technological zeitgeist. László Moholy-Nagy would later influence the editorial design work of the American graphic designer Paul Rand (Moholy-Nagy).

In general, the graphic design ethos of these practitioners aimed for a universal, abstract form of visual communication that produces clarity and reason. From such a vantage point, typography was to be subsumed by the logic and order of the layout grid and the logical arrangement of the whole composition rather than the aesthetic, textural or cultural particularity of the font (Sowersby). We can see this best in the championing of low-contrast sans serifs placed within rationalist grid systems, as in Müller-Brockmann's influential text *Grid Systems.* Another example is Herbert Bayer's "universal" sans serif, with even the uppercase letters stripped away to allow for optimal simplicity of form (Lupton and Miller). This interest in an abstract, universal typography was interpreted later into the trend of sans serifs as defaults in user interfaces in the 2010s (Bollini) as well as the homogenization of brands' visual identities in the 2020s (Valdivieso) on the same grounds of seeking a universal, abstract visual language to communicate a simplicity and clarity of function that would be intelligible in a globalized marketplace.

The visual rhetoric of abstract neutrality expressed as sans serif was

challenged on various fronts following the 1960s, and continues to be challenged today (Kinross; Rath). The priority of abstract universals to achieve optimal function as the first principle of graphic design contained an implicit relationship with the role of beauty in visual communication. In contrast to Tschichold's disregard in the 1920s for beauty, which he considered not applicable to the function of typography (Tschichold, *New Typography*), Paul Rand by the 1960s considered the importance of beauty to enhance as a kind of super-function of designed spaces such as cathedrals (Rand). Push-Pin Studios, the New York City graphic design studio led by Seymour Chwast, Milton Glaser, and others, exemplified a more illustration- and lettering-based design practice that championed expression and individuality in design solutions (Meggs). Pastiche and historicism became areas of interest for graphic designers in the 1980s and onwards—and even the return of classical typesetting practices, as a rejection of the graphic design orthodoxy originated by the Bauhaus (Meggs 506). In his reactionary later career, even Tschichold, author of The New Typography, called for a return to the traditional typesetting and layout the younger Tschichold had rejected as not aligned with the zeitgeist of modernity (Tschichold, *Form of the Book*). There was a renewed interest in a historical perspective on graphic design practice before the industrial revolution or the Bauhaus (Bringhurst 141). We can see this motivation in the publishing of Meggs's History of Graphic Design and in the application of art history models to the organization of typefaces in Robert Bringhurst's Elements of Typographic Style. The interest of type designers like Jonathan Hoefler in digitizing wood type and other industrial revolution–era fonts was partly influenced by the interest of graphic designers: Champion Gothic, Hoefler's first published typeface, was commissioned by Sports Illustrated as a set of fonts organized around variation of width rather than the expected norm of weight (Hoefler). Pentagram designer Paula Scher used revived nineteenth-century wood type to create visual interest and evoke dynamism

in work for the Public Theater in New York, using a wide array of widths of a grotesque sans serif (Meggs 603). The intention of the Public Theater identity was to present a visual language that expressed the organization's mission to provide accessible and innovative performances (Pentagram).

To summarize, there are two camps of typographic practice in graphic design: one views typography as material that should be generalized and abstracted to achieve design's visual communication objective, and the other emphasizes the emotional, social, and cultural domain, so typography becomes a prominent visual element rather than playing a supporting role to larger logical structures such as grids.

Survey of Current Models of Typography Instruction & Shortcomings

In light of the tug-of-war between these two schools of thought in graphic design practice, typography instruction within graphic design education tends to be oriented to four major categories: anatomy of Latin letterforms derived from calligraphic and lettering practices (Lupton; Cheng); historical development of fonts according to European art history categories (Bringhurst); formal abstraction of letterforms as patterns for composition (McCormick); "bespoke typography," the somewhat confused grouping of lettering, logotypes, and type design (Smeijers 19).

These four aspects of typography education tends to have domain-specific areas of function that do not overlap. For example, the typesetting of prose in a printed book with headlines and body copy, to be read at arm's distance, demands different criteria for assessment than a movie poster with a title and secondary descriptive information, to be seen at a greater distance and for a shorter time duration. Meanwhile, in contrast to both the book and the promotional poster, the interactive user interface of an application has different affordances in time duration and user intention. A similar disconnect of typographic properties and usage occurs with marketing and branding,

which may include the three prior use-cases, but need not be exclusive.

Along with heterogenous function for typography, the lack of standardization between fonts is a well-established difficulty in font pairing. Font size was not a quantified unit until the Didot point in the late eighteenth century. Before that, font sizes were named, and names varied by printer and type foundry. Even after the quantification of font size, the size of the contour outline within the body of the glyph remained variable; some fonts are "large on the body" and others are "small on the body." For different fonts to be used together, size adjustments are required to match one font with another according to x-height or capital height (Smeijers). Font weight is not standardized between font families either, so the "bold" of one font may visually appear to be lighter or heavier than another font's "bold." The choice of stem weight for the font also continues to be an individual designer decision. The use of CSS numeric values for weight obfuscates this lack of standardization between fonts; the font weight values are nominal and not attached to any universal, objective measure (Smeijers). There is a similar issue with font width: there is no quantifiable standard as to what makes a narrow, regular, or wide font. Such naming is left to the font's designer. Beyond the lack of quantified measurements for weight and width, there is generally a lack of awareness that the size, weight, and width of a font are mutually connected features that interact to affect typographic color for the reader. Some scholars in type design and book typography — notably Noordzij and Bringhurst — present models of typographic color that take into account the interconnected relationship between font size, weight, and width, but such discussion is absent from most typography literature, such as Lupton's *Thinking with Type* or Cheng's *Designing Type.*

Responding to Abundance of Digital Fonts

In light of the abundance of font options for designers and the lack of a coherent discipline model for creative font pairings, more inquiry into responses to digital product abundance is warranted. While digital abundance allows for near-zero cost reproduction of a product (Eve), the abundance of digital products creates a new scarcity of individual attention in saturated markets (Eve). Barry Schwartz proposes the concept of a "tyranny of choice," where the increase in products and options for subjects to choose from results in a decrease in psychological health measures along with subjective descriptions of overwhelm (Schwartz). Confronted with an abundance of choices, a common rational response is to reduce the complexity of the information received by the subject in order to make effective decisions and interact with other agents (Berger and Calabrese). Three tactics for complexity reduction are deployed in response to digital product abundance: use of defaults, internalized rule sets, and curation.

Default bias is the tendency of a user to act based on the conditions initially presented. Some policy makers have advocated for the use of default bias to non-coercively nudge users toward desired policy goals. Having the option to register to vote affirmed by default when a person registers their car is an example of leveraging the default bias (de Haan and Linde). In the case of fonts, the reason certain fonts are used is that they are the defaults of the user's operating system or application; the user made the choice to just use the default font provided to them (Fox).

An internalized rule set for fonts is a prescriptive list of fonts that meet the diverse needs of a designer. Designer Massimo Vignelli is famous for promoting such a rule set (Coles). Vignelli's prescribed set of fonts included Helvetica, Bodoni, Garamond, Clarendon, Times New Roman, and Futura. This mantra has endured within HCI communities that see the value of Vignelli's rule set for complexity reduction in their user interfaces and other

digital user experiences. Empirical evidence does verify that limiting choices to one parameter overcomes the feeling of overwhelm for users exposed to digital abundance (Fasolo and McClelland).

Curation is an activity that orients a set of objects to be valuable to a user. In this context, curation allows the user to delegate complexity reduction to a third party. Curation can be thought of as a sliding scale of increasing editorial intervention in a set of products. The most general is to simply make a range of products available for access to the user; tags and categories are used to organize the assortment of products. Next is curation that legitimatizes the quality of particular products. Legitimatization would include "expert" or popular star ratings. The user delegates the task of researching the quality of a product to curation. The highest level of curation is to contextualize the value of products in a historical, entertainment, or utility context (Jansson and Hracs). Large Language Models (LLMs) have been used by various platforms such as Spotify to generate personalized collections based on user preferences and habits, which we can consider an expression of curation (Pichl et al.). Adobe Fonts's "font similarity" search feature is built from such LLMs.

Limitation of Complexity Reduction Tactics for Font Pairing

So far we have reviewed three responses to information abundance and complexity. Each of these tactics has limitations when the user intention is creative font pairings for both font users and type designers. The default response to complexity is antithetical to the process of creative font pairing, as the user simply ignores the consideration of which font to use in their visual communication. The limited rule set is a reasonable choice when the abstract/functional role of typography is considered important, but visual novelty and surprise is by definition excluded from the limited rule set tactic. Curation is also a rational choice for decision making, as being exposed to

many options without a clear parameter to assess those products can lead to overwhelm. However, font pairings do not have such clarity of attribution due to various factors. Tags do not have a controlled vocabulary and lack a hierarchical taxonomy structure (Kolbitsch), and font tags are more subjective than other benchmark datasets, which magnifies the problem of vocabulary mismatch between users and distributors of fonts (Choi et al.).

Can AI Save Us From Font Abundance? Somewhat.

In place of improving user interfaces or other tactics for search and curation, Large Language Models (LLMs) have been investigated as a means to manage the digital product abundance of fonts. LLMs have been used extensively to perform formal similarity mapping between fonts and find fonts similar to a target source (Choi et al.). These functions have also expanded to produce digital artifacts based on users' text prompts and visual references. Such curation and exploration functions are quite promising, but studies using LLMs tends to be fixed to a particular use case, such as selecting fonts for posters, and do not consider the interpolation of such results to other typographic use cases for which designers require assistance in font pairings (Bringhurst 20). Also, it is the transition from surveying and exploration to particularized action that is the common bottleneck in search tactics (Rutter et al.).

Generally, we can state that the bottleneck of AI-guided search, exploration, and creativity lies in the transition from divergent thought to convergent thought and action. Divergence and convergence articulate the iterative feedback and feedforward tendencies in design inquiry (Banathy 74). Divergence refers to the quantity of alternative hypothetical solutions to an articulated circumstance, and is characterized by an absence of judgment regarding the validity and aptness of the ideated images or solutions. Convergent thinking, in contrast, translates the open possibilities of divergent thought processes

into practical execution, manifesting as actions and artifacts in response to constraints (Javaid and Pandarakalam).

Within the "double diamond" design process model proposed by Banathy, divergence and convergence occur twice. The first diamond generates images through a process of discovery and definition. These images are then applied and validated to generate models. Images are hypothetical representations that potentially enact the intended objective of the design inquiry but require validation. Models, on the other hand, are generalized artifacts or patterns that will likely enable the intended objectives of the design inquiry (Banathy 77).

Convergence is particularly important in the context of creativity because creativity has an unstable epistemic status: what is considered an error in the image generation phase of the design inquiry may become self-evidently correct in the model generation phase (Banathy 198). Convergent creativity is involved in both phases of the double diamond model. The posterior evaluation and selection of promising hypothetical images constitutes an act of creativity. This aspect of the creative process is referred to as "illumination" by Banathy (200). Creativity as a convergent practice also occurs in the generation of models through the combination and synthesis of seemingly incompatible images (Banathy 212). This aspect of the creative process is termed "verification" (Banathy 206). Thus, the retroactive illumination and verification elements of creativity require tools for convergence to support the divergent aspects of preparation and incubation in the creative process.

Aids for Convergent Thought Patterns and Tactics In Design

Prompts have been found to be beneficial for designers. An empirical study exposed architecture students to a digital prompt-based annotation interface where the pupil's location would trigger instructor-created annotation prompts. The experimental group was found to have better learning outcomes compared

to the control group (Lee et al.). It has been noticed that prompt-based and sketching-based ideation play different roles in the design thought process. Prompts were found to be beneficial for initial ideation, and sketches were found to aid in the formal creation of the design object. There is a feedback mechanism between the process of divergence and convergence to come to a final design artifact. Prompts assist in the initial ideation, while sketches assist in the formation of visual artifact directions (Lee et al.). These findings clarify how prompts are effective for graphic designers. We now consider how online prompt services provide utility for designers.

For general graphic design prompt services, we can turn to the following examples: FakeClients is a website that generates design briefs. The briefs available are for various topics such as logo design, websites, graphic design, UX/UI, illustrations, writing, poses, and painting. The format of the prompt is a letter from an individual identified as the owner of [business name] with an interest in hiring a designer for [industry]. They require [artifact] for [business objective], and note [formal limitation] for the assignment (Van Deven). Sharpen is a website that generates prompts based on branding, marketing, and product/ UX. The format is designing [artifact] for [entity] in [style] (Nobari and Gibson).

To zoom into typeface design, type designer and educator Erik van Blokland created the TypeCooker website as a supplement to in-person instruction. TypeCooker is a prompt generator website for type design briefs. Based on the setting the user selects for experience level, from "starter" to "pro," the website generates a list of prompts to design a font. The variables increase in number and complexity as the experience level setting is changed. For example, at the "starter" level, five parameters are provided: construction, stroke endings, weight, width, and contrast. At the "pro" level, fifteen variables are presented to the user, ranging from formal qualities like weight width

and ascender length to functional qualities such as intended usage and size (Blokland, "Some Notes"). Blokland reflects that the educational consequences of TypeCooker are especially useful due to the possibility of conflict within the parameters: two directives may conflict with each other. This is good in Blokland's estimation, because "observing that a particular requirement is difficult to solve is a valuable discovery for a student." That is, learning the trade-offs when various typographic properties interact is an important distinction of mastery in the typographic discipline (Blokland, "Some Notes"). The adjustment of decisions and artifacts according to trade-offs is a convergent thought activity that demonstrates mastery in a domain practitioner. Such an account of practitioner knowledge is reminiscent of Plato's Phaedrus, where we're told that knowledge of a discipline entails knowing the elements of the discipline, but also its unifying principle end. Plato uses the example of music, its elements being the high and low note, and the principle good of music being harmony (Phaedrus 268D). To return to design, the harmonization of competing criteria to articulate a design artifact is an essential capacity of the professional designer. For a prompt-generated intervention to be beneficial for creativity, a process of convergent thought, and not only divergent thought, is necessary. A review of bricolage may prove beneficial at this juncture to understand the interplay of divergent and convergent processes.

A Look at Bricolage Engineering For Help

Bricolage is the activity of generating a new work out of an assembled set of diverse parts without a known outcome at the start of the process, but with clear criteria for success with the use of feedback mechanisms (Taleb 199–200). Bricolage sits in a middle space between the divergent and convergent thought processes, but its essence is the act of choosing the best outcome from random and diverse presentations (Taleb 199). Generally, a process of randomization

is deployed to externalize the divergent process, whereby the agent reviews the produced possibilities and selects based on a measurable objective the best option to iterate the process again. The engineer Frances Arnold used the bricolage process to produce a version of the naturally occurring enzyme subtilisin that would work in harsh chemical environments (Hammack). There was too much complexity in the amino acid arrangement of subtilisin for Arnold to know which of the 275 amino acids should be changed to allow the enzyme to function well in the unanticipated environment. Instead, Arnold elected to expose samples of subtilisin with only one or two amino acids randomly adjusted into a solvent. From the exposed samples, the best-performing sample to dissolve protein was selected and iterated on in another cycle, but with a solvent with a higher concentration of the chemical. This process looped until an enzyme was discovered that performed the protein breakdown process in harsh chemical environments just as well as naturally occurring subtilisin did in water.

Feedback Mechanism in Communities of Practice

While prompt tools and the enzyme development of subtilisin both deploy randomness in their iterative processes, the key element in the subtilisin bricolage process that is absent from the prompt mechanism of TypeCooker and other prompt websites is a measurable objective connected feedback loop. There have been some attempts to provide a relevance feedback mechanism. For example, the website Dribbble was founded to provide designers a space to share work-in-progress projects for community support and feedback. However, as the website scaled in user count, the interactions between users shifted from intimate and critique-oriented to anonymous and promotional (Duan).

Creativity and Surprise

Because creativity is grounded in relevance, we come into a significant difficulty: there is no stable, homogeneous class of entities corresponding to the term "relevance" (Vervaeke et al.). This is a significant roadblock for cognitive psychology and AI research as well as for the graphic design discipline. For many tasks conducted by humans, one or more of the following aspects of cognition are incomplete, vague or missing: the initial state of reference, the goal state desired, and the affirmative and constrained methods to achieve the desired state. Such uncertainties require an evaluation of relevance—of what to attend and focus on—called a conceptual frame, which responds to the environmental conditions to achieve an end goal. Such a frame determines relevant features, controls or actions for problems encountered in the real world. (Vervaeke et al.). Frame determination is connected to Blokland's observation about the educational value for typeface design students of learning the trade-offs between various typography features. Creativity is by its nature related to activities conducted by agents in which there are incomplete, vague, or missing elements in the end state as well as the affirmative or constraining pathways (Taleb 17). Any satisfactory model of creativity would have to account for the agent's ability to adapt or modify various expressive tools, styles, aesthetics, and auditory or visual languages connected by a opaque network of relationships within social-cultural history, biography, and conceptual parameters to produce artifacts and actions relevant to a particular problem space (Jackman). Like relevance, optimal fit presumes that the feature or desired end state or trajectory to achieve the desires of an agent is clear, known, and complete (Vervaeke et al.).

Within the visual arts, it has been found that aesthetic reasoning is the establishment of an optimal fit between unity and difference according to various material, functional, and social parameters (Iandoli and Zollo). As the desired end state of design is beauty, and beauty is said to be directly

linked to creativity, a consideration of beauty is warranted. Within cognitive science literature, information theory's notion of surprise has significance for relevance realization. Surprise is prediction error between the agent's model and the sensory model of the external world. It has been argued by some scholars that surprise is a core aspect of beauty (Satyam). Such beauty is critical to pedagogy, as the intellectual and emotional aspects of the subject are aroused in encounters of beauty (Marmur and Koichu). Epistemic arcs around opening and contracting of prediction errors in the encounter with an object of beauty in virtue of these objects' capacity to engender curiosity, relevance realization, emotion and moods in the subject. (Van de Cruys et al.). This literature is relevant to design inquiry because it provides an objective and extra-subjective function to beauty that is contrary to the notion, common since Hume's *Of the Standard of Taste*, of beauty as subjective & arbitrary.

To return to relevance realization, researchers have proposed that ultimately, the cognitive process of organisms, which entails creativity, is simply not computational by virtue of organic life's activity of relevance realization (Jaeger et al.). This separation of organic and computational processes has to do with the improvisational nature of creativity, an ability to incorporate abruptly diverse frameworks that is not possible for computational models (Gallagher). While a general computational theory of relevance is impossible, a theory of the self-organization mechanism that has competing interchange of frameworks of features, controls, or actions for relevant state outcome is possible (Vervaeke et al.). Such a framework can assist practitioners in producing creative actions and artifacts. For example, improvisational comedy can be articulated with frameworks and structures that increase the likelihood of humor (Halpern et al.).

Conclusion

From this literature review, we can affirm that prompt frameworks and structures for font pairing may increase the likelihood of surprise in design

artifacts. For such a framework and structure to be effective, a coherent scheme for typography better than the historical best-practice taxonomy is necessary. Also, a prompt mechanism that engenders creativity will need to address the heterogeneous formal, conceptual, and functional aspects in communication design artifacts. Lastly, a framework for creativity in font pairing needs to account for a feedback mechanism of creative associations, interpersonal assessment, and reflective adjustment of artifacts based on trade-offs of end objectives, especially when such objectives are vague, incomplete, or totally absent at the start of the creative process.

D. Visual Analysis

*The Eephus League Case Study, (*BETHANY HECK, 2010). FIG 1 As a thank-you gift to backers of the Eephus Scorebook Kickstarter campaign, Heck produced a folded 12 x 18" "golden ticket" poster. A full-bleed photograph of

FIG 1. GOLDEN TICKET, BETHANY HECK (2010)

Grover Cleveland "Old Pete" Alexander overtakes the entirety of the poster. Alexander was a pitcher in the National League, inducted into the Baseball Hall of Fame for his record of 90 shutout games during a season. Printed in black on steel-gray french paper, the image of Alexander is subtle, and more textural than content-oriented. Meanwhile, the typography and other elements are printed in gold foil stamped onto the paper, centered on the face of Alexander.

The content elements in the poster have been divided into sections using paragraph and vertical bars, with text oriented both vertically and horizontally. The outer content is arranged in a horizontal orientation, while the main content is set vertically with the cap-height facing the direction of Alexander's face. The top outer area contains the purchase number of the Kickstarter backer, and the bottom outer area contains supplemental information, such as the year the product was produced, the location, and a reminder to bring a writing utensil to opening day of the baseball season using the Eephus League scorekeeping booklet. The vertically placed inner content contains many elements. Starting with the headline and working from left to right, it includes the following: the headline "A Beautiful Day for Baseball"; the text "win/loss" separated with a solidus; the text "You've certainly got the best seat in the house"; a baseball base icon; the text "for all innings 1–9" with the en dash replaced by a baseball diamond; the text "This ticket is transferrable / Admit One / Eephus League Member"; the text "Scorebook No. 2 1/4"; The text "Thank for making the Eephus League a part of your baseball gameday experience. Happy scorekeeping!" It should be noted that all the type is uppercase. This was likely an intentional choice by Heck, as letterform construction is identified by her as an important parameter in harmonizing diverse fonts (Heck, "Multi-Typeface Design").

Set in a font size large enough to fill the measure of the inner content

block, Hoboken High is used for the first headline row ("A Beautiful Day for Baseball"). The condensed chamfered sans serif allows for a large font size within a measure. The next row of content contains the "win/loss," the "You've certainly got…" text, and baseball base icon, with the "You've certainly got…" text taking up the vast majority of the horizontal space, with the "win/loss" and the base icon in approximately 4:3 ratio rectangles. The "win/loss" text is set in Interstate, with "loss" in a bolder weight. The "You've certainly got…" text is broken into two centered lines, the first set in Founders Grotesk, balanced with ruler strokes to the left and right of the text, and the second line set in italic Hercules. The third row of content is also divided into three subsections. Hoboken High is used for "For all innings," Interstate Bold for "1–9," and a lighter weight of Interstate for the text "Eephus League Member." Founders Grotesk in various weights is used for the text "Admit One" and "Scorebook." A condensed version of Founders Grotesk is used for the "No. 2 1/4." The fourth row is set in roman Hercules.

The Golden Ticket poster exemplifies Heck's practice of maximal typography, with a high diversity of typefaces and even diverse font styles within the typeface families selected. Various tactics such as color, font size, weight, position, capitalization, linguistic division and function work together to harmonize diverse font styles and genres. This ensemble of fonts recalls early-twentieth-century Americana in a coherent and orderly way, while also providing a visual solution that is vibrant and nuanced in its font pairings.

TypeCooker (ERIK VAN BLOKLAND 2004), https://typecooker.com/ FIG 2, 3, 4. T'The TypeCooker website is lightweight website comprising a single HTML page, a CSS file, one Javascript file, and a JSON file containing the parameters. Within the JSON, each parameter element is arranged with child elements. For example, the parameter "Application" contains 10 possible features. Each

feature has five elements: URL, level, name, weight, and description. When a user loads or refreshes the webpage, the parameter features are updated. However, it is important to know that the TypeCooker website is but a small part of a larger pedagogical system. This is a feature rather than a bug for TypeCooker, as the website can be used in various functions, ranging from individual use to classrooms and workshops.

For the sake of visual analysis, we will consider the TypeCooker Flickr group in which users upload the results of their TypeCooker ideation practices. The photo-sharing website Flickr acts as a presentation website for TypeCooker ideation prompts, together with community commentary about these ideation directions. A review of three renditions of TypeCooker prompts as explored by typeface designer Nina Stössinger in 2012 will provide important insights into how the TypeCooker prompt protocol is applied in type design ideation.

The TypeCooker prompt "monospaced upright italic for TV subtitles" is rendered as the control letters h, g, o, r, b, j, k, e, m in marker and Wite-Out (fig. 2). While these letters do not constitute a morpheme, nor a typical type design prototype word such as "adhesion" or "handgloves," the characters selected by Stössinger do cover the anatomical features needed to prototype typefaces for Latin lowercase: the generic round glyph o; the ascender value, as captured by glyphs h, b, k; the "control" straight glyphs h, m, and r; the combination of a straight element and a round element in the glyph b; diagonal elements with the inclusion of the glyph k; a tittle in the glyph j; the descender value, as captured by the glyphs g and j; and lastly, round characters with terminals to be articulated in the glyph e. Wite-Out is extensively used to correct stroke renders of curves and stems. There are guidelines to maintain a consistent descender line, baseline, x-height, and ascender line. The usual ink trap parameter feature as seen in the stem terminals is incorporated into

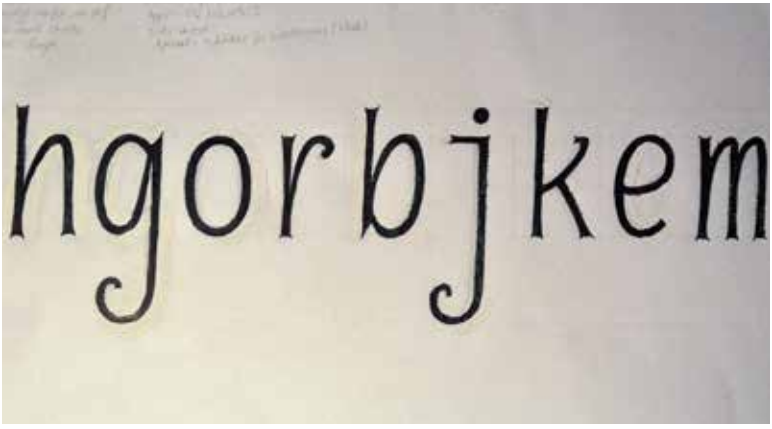


FIG 2. NINA STÖSIGGNER, TYPECOOKER EXERCSIE (2012)

the sharp spur element of the b and the one-story g. This sharpness is unexpectedly countered by the arrive arching in the shoulder of the lowercase h, the w-height position diagonal stroke of the k, together with the finial strokes of the one-story g and j. It is likely that these unexpected features resulted from the upright italic parameter feature in the prompt. Of interest is the note by Stössinger that the function parameter and weight parameter were contradictory, so the weight parameter feature was changed from "very thin" to "somewhat light."

The photograph of the ideation sketch is presented in the context of an online community of practice on the Flickr platform, where type designer Stössinger ideated and communicated with other practitioners. The ideation sketch serves as a reference point for discussion between practitioners. For example, typographer Tiffany Wardle comments on the surprising difficulty of this prompt and provides encouragement and support to Stössinger. While most of the comments on this post are generic positive affect comments, Erik Van Blokland does comment to Stössinger on the underrated quality of swash

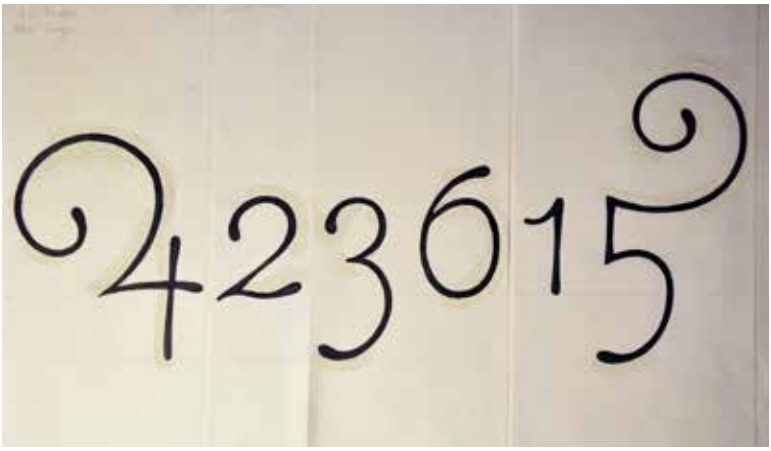


FIG 3. NINA STÖSIGGNER, TYPECOOKER EXERCSIE (2012)

numerals.

The TypeCooker prompt "a wide light monoline serif with swashes but no ascenders" is executed in a controlled ink and Wite-Out rendering of the numerals 4, 2, 3, 6, 1, 5 (fig. 3). Rendered on separate sheets of paper trimmed to the set width of the numeral, the pen rendering is done carefully to articulate the gradual stroke modulation at the initial and finial strokes of the numerals. There are light guidelines to coordinate consistent baseline and x-height position between numerals. Wite-Out is used to correct excessive use of marker and maintain even typographic color. We see the use of Wite-Out most where it's used to correct curve areas like the swashes on the 4 and 5, as well as the bowls of the 2 and 6. While the prompt specified no ascenders, Stössinger felt inclined to disregard that directive with her extension of the strokes in the 4, 6, and 5 beyond the x-height guideline. This is particularly interesting, as the practitioner's discernment led her to weigh the factors involved and shift from outright removal of a necessary feature to a bare minimum use of said feature. That is, instead of adding no ascenders to the

FIG 4. NINA STÖSIGGNER, TYPECOOKER EXERCSIE (2012)

4, 5 and 6 characters, Stössinger opted to use minimal ascenders, to allow the glyphs to be legible.

The TypeCooker prompt "a grunge monospaced Helvetica as drawn by Gerard Unger" is rendered in scratchy marker strokes as the letters n, o, p, a, i, g, e, k (fig 4). Stössinger incorporates the "Unger" characteristics of sharp tapering joint elements and finial stroke endings. While some Helvetica characteristics—the teardrop shape of the a's bowl, the stroke position of the lowercase k's diagonal stroke from the x-height relative to the leg stroke—are incorporated, these features are weighted much less than the Unger features Stössinger intended to visualize. The grunge parameter is there in the rendering of spotty artifacts around the primary letterforms, as if these elements had broken off.

The nature of "Unger-ness" in typeface is discussed in Stössinger's commentary about her ideation sketch and affirmed by type designer Frode Bo Helland. There's also an exchange between Stössinger and type designer Ben Mitchell about possible optical adjustment to the monospace m to main-

tain typographic color. Stössinger reports some empirical measurements of various monospace typefaces and suggests that the reduction of stems in the lowercase m in monospace fonts is a recent historical development in type design.

From Stössinger's use of TypeCooker we can conclude the following three points: 1. While TypeCooker provided the prompts, a supplemental platform was needed to for the hosting of artifacts and community engagement about the work produced. 2. These ideation drawings by Stössinger demonstrate subtle norms of practice that are outside the parameters provided by TypeCooker. We can see these extra-normative practices in the selection of glyphs to draw that exemplify the shape language of Latin letterforms, and in the designer weighing the degree to which various parameters are to be applied to the ideation sketch. 3. Prompt-directed ideations generate technical, social, and historical considerations for practitioners.

Sharpen (ARMAN NOBARI AND ANTHONY GIBON, 2017) https://sharpen.design/ FIG 5 SSharpen is a prompt generator website designed by Arman Nobari and Anthony Gibson based on their experience preparing for designer interviews. As Nobari writes in a blog post, in lieu of spec work, companies increasingly rely on hypothetical design challenges and prompts to evaluate the skill set and working methods of prospective designers. He goes on to say that the first rendition of Sharpen was in a paper format, where pieces of paper in two piles would be grabbed at random to produce a prompt, which he would then design. One pile was a list of artifacts and the other a list of clients, e.g. "design a landing page / for NASA."

The website is organized in three horizontal sections: a navigation section, a set of selection buttons, and a large header section. The navigation section contains two groupings: on the left side of the viewport, the logotype

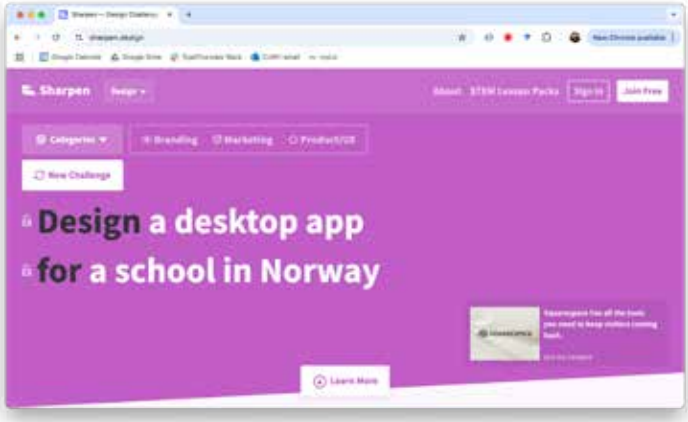


FIG 5. SHARPEN.DESIGN HOMEPAGE (2012)

and a dropdown menu; on the right side, secondary information including an "About" page, a link to other prompt products, and "Sign in" and "Join" buttons. The next row contains dropdown menus for the design prompt categories. By default, all categories are used for the prompts, but users can select a narrower range of categories based on branding, marketing, or product/UX. Below the category selector is a prompt reset button. Below, the prompt is presented to the user as two headlines: the first line is the artifact to design, and the second is the audience or client. Some of the prompts also include a third "and" line, which is an additional limitation or requirement for the prompt, e.g. "and make it geometric" or "and make it in an hour."

The website color indicates that a new prompt has been generated, shifting with each refresh of the prompt from purple to orange, then pink, and finally blue. Source Sans Pro is the font used throughout the website, in various sizes and color values. The prompt text is largest, at what appears to be 2rem in font-size, with key words like "design," "create," "mock-up," "for," "and," etc. differentiated in a blueish-gray hue, while the content of the prompt is pure white. Each line of the prompt has a lock icon on the

right side, which the user can select to lock in place one of the parameters while refreshing the other. When the lock is active, the icon becomes a fully opaque pure white.

The remainder of the website contains marketing and advertising content. Advertising is presented as a div box on the bottom right of the viewport using the third-party ad marketplace Carbon. When the user scrolls down, marketing copy is presented to promote premium custom prompt generators for employers, as well as Sharpen's STEM content prompts. There's an appeal to the authority of large corporations and education centers such as Dribbble, Google, CreativeMornings, and the Rhode Island School of Design in the form of logos in the marketing copy promoting the value of design prompts. Further down the page, a testimonial section includes an image of a middle-aged man on the left, identified as Mike Buzzard, a Design Manager III at Google, paired with text promoting the value of design prompts for evaluating job candidates. The bottom of the webpage has a newsletter sign-up form and a footer section with a site map.

i. Case Studies

The Eephus League, (BETHANY HECK, 2010). TThe Eephus League of Baseball Minutiae was Bethany Heck's undergraduate senior thesis project at Auburn University. Heck's lifelong interest in baseball, including the minutiae of baseball statistics, provided for her a wide range of content for typographic explorations. Bethany's father was a letterpress printer, which influenced her own interest in vintage wood type (Kimball). Originally a user-driven baseball blog, the Eephus League launched a Kickstarter in 2011 to fund products and publications related to baseball. While the Eephus League was primarily a website, Heck also produced printed physical products to supplement the website at her thesis exhibition: a baseball score-book and some other products

and publications. Heck considered what a scorebook made by Moleskine might look like, and wondered if good design could alter the perception of score-keeping. The original run of 5,000 scorebooks was funded in 2011 for a total of $27,002 by 890 backers (Kimball).

After graduation, Bethany had influential roles at editorial publication websites with a strong emphasis on typography. As Vox's executive director of audience experience from 2016–2017, her key priority was to push the editorial expression of Unison, the proprietary front-end system of Vox Media, to reinforce the brand's voice. In addition, a card system for content based on viewport dimensions allowed for a responsive web presence that managed latency concerns and featured impactful typography and imagery. In 2018, Bethany accepted a head of design position at Medium. During her tenure, she was involved in changes to the typography presets on the blogging platform. The headline font was swapped from Freight Sans to Zerfallen, a jagged serif that paired with the then-new Medium logotype in Noe and provided a striking contrast to the sans-serif font choices on the rest of the platform. In both roles, Heck was keenly aware of the relationship between typography and user experience and content systems.

Heck is well known for her unorthodox treatment of typography (Shoaf). Instead of the typical practice of limited font pairings, Bethany is known as a typeface maximalist; instead of using one or two fonts, Heck is known to use four or more extremely diverse font families in a given project. She writes that the treatment of type ought to be based on the interaction between the content structure of a work and the formal structure of the type on the canvas. Considerations such as size, capitalization, formal construction, contrast, spacing, contrast and weight all factor in, creating diverse yet unified typography (Heck, "Multi-Typeface Design"). For example, an alternation in capitalization of content of a headline can break in similarity relationship

with other fonts within a set. One of Heck's most intuitive recommendations is to alter typography when there is a difference in content type or function. Much of Heck's advice mirrors the editorial role proposed for designers by Paul Rand: the designer may be tasked with restating the design problem if the material provided is inadequate (Rand). An example of typography alternation based on function and content type distinction is the UI of menus for Microsoft Power BI. The font DIN Bold is used for informational content, while the font Segoe Regular is used for user interactions. Such typographic alternations allows users to more fluently understand content and actions of the user interface (Heck, "Multi-Typeface Design").

Heck applied this maximalist approach to typography in the redesign of Eephus League in 2016. She achieved a logical and harmonious typographic palette by styling common elements consistently but making unique content elements typographically distinct: body copy elements had a common font treatment, while headlines of distinct content types would be injected with a typography alternation (Heck, "Multi-Typeface Design"). For Heck, letterforms are just as valuable as graphic elements as they are as representations of language, and asking type to serve multiples roles in a composition is a reliable way to elevate the quality of one's work (Heck, "Structural Typography").

TypeCooker, (ERIK VAN BLOKLAND, 2004) URL: https://typecooker.com/
A graduate of the Royal Academy of Art (KABK) in The Hague, Blokland returned to KABK in 1999 as the head of the Type and Media graduate program. Blokland developed TypeCooker as an online education tool for typeface ideation for a wide range of teaching modalities based on his pedagogical practice at KABK (Blokland). The user specifies a level of ability ranging from "starter" to "pro" for a total of five settings. Each setting lists parameters for the student to ideate a typeface. For example, the "starter" setting contains

five parameters: "contrast amount," "width", "construction," "stroke endings," "weight." These parameters correspond to typeface design elements described by the Noordzij stroke model of letterforms (Blokland). The parameters are randomly filled based on a list pre-set by Blokland in a JSON document. When the user refreshes the webpage, the parameters are filled with different features. Each parameter and its features are explained by clicking on the parameter. For example, "contrast amount: a lot" is described as "thicks are a lot thicker than the thins." Meanwhile, at the other extreme, the "pro" setting, the five "starter" parameters are supplemented by nine other parameters, for a total of fourteen parameters for the student to ideate typeface directions.

The TypeCooker protocol has been influential in typeface design pedagogy. Nina Stössinger, now a type designer at Frere-Jones Type, wrote about her experience using TypeCooker for three months of daily sketching to develop her type design practice (Stössinger, "Sketching"). Using TypeCooker, according to Stössinger, expanded her understanding of possibilities within the type design parameters, helped initiate digital font prototypes, and served as a method to overcome burnout, deadlock, and frustration ("Sketching"). Stössinger's reported experience interpreting the more advanced prompts articulates the intentions of Blokland, who says the randomly listed parameter features require the student to consider "an objective approach to drawing" (Blokland). Blokland goes on to acknowledge that the possibility of conflicting parameter features is a boon for students, because realizing that particular parameter interactions are difficult is an important pedagogical outcome (Blokland). Nina confirms this objective, writing that obtuse prompts like "monospaced upright italic for TV subtitles," "a wide light monoline serif with swashes but no ascenders," or "a grunge monospaced Helvetica as drawn by Gerard Unger" required significant intellectual consideration to map these

various feature parameters to a resolved typeface (Stössinger, "Sketching").

Diverse organizations and communities have adopted the TypeCooker prompt mechanism for various ideation and pedagogical purposes. The Latin-American type design conference Letrástica features TypeCooker exercises that are recorded and uploaded to YouTube (Letrástica). In group interactions, pupils work on letterform directions based on the prompt, then provide feedback to each other online. The Noordzij stroke model that is behind TypeCooker allows for multi-script typeface ideation. For example, the type foundry Mota Italic produced an Indic TypeCooker website, following a format similar to the Latin-centric TypeCooker (Saxena) Similarly, the Arabic Type Design–Beirut program adapts the TypeCooker protocol to the Arabic script (Jockin), and Korean type designer Minjoo Ham cited TypeCooker as a model for ideating Hangul script typefaces in her talk at TYPO Labs 2018 (Ham).

TypeCooker has been influential in typeface design ideation by virtue of its generalizable parameters of increasing complexity. These parameters, which are predicated on the Noordzij stroke model, are particular, yet also universal enough to letterform construction to be used in various script systems as different as Arabic, Indic, and Hangul. The increasing specification based on function and material application point to the complex interaction between features of letterform construction and the usage parameters graphic designers tend to consider. Lastly, historical parameters such as "drawn by Gerard Unger" point to complex cultural, social, and historical features that extend beyond material and formal criteria in typeface design ideation.

KernType: A Letter Spacing Game (MARK MACKAY 2011) https://type.method.ac/
KernType was published online in 2011 by Method of Action, the studio of designer Mark MacKay. At its initial release in 2011, the game was featured

in articles on The Verge, Fast Company, Creative Blog, and Google. The popularity of the site continues today. For example, in a ten-day period from November 1 to November 10, 2024, the website had 32,065 unique visitors. Projecting this statistic to 30 days, the site would have 96,000 unique visitors per month, or 1.1 million per year. From these reported and projected website statistics, it is reasonable to conclude that KernType is successful and influential as a game-based design pedagogical website.

On the KernType webpage, users are presented with a single word that covers the horizontal viewport within a set of nested div tags and an SVG tag with inline path declarations. The supporting elements, such as cap-height, baseline, and x-height are also inline paths within the class labeled "scene." The glyphs are a white color when the scene region is not hovered over. When the user hovers over the scene region, the glyphs become gray, with a hex value of A4A6AE. The first and last letter are locked in position and remain gray. The user is tasked with moving the letters between the first and last glyph to their optimal position. When the user hovers or focuses over a movable path, the glyph returns to a value of white, and the cursor is altered to a double arrow. Meanwhile, when the user hovers or focuses over an immovable path, the glyph remains gray and the cursor is altered to a circle with a slash across the middle SVG icon, with a text prompt "cannot be moved" appearing on the DOM. Below the large SVG glyph paths is information about the font (font name, creator, year produced) presented to the user for each participating round.

Various keyboard shortcuts that mimic font editor functions are provided to the user to move the glyphs with increasing precision: Tab moves the focus of the web browser to the next letter. Shift + Tab selects the previous glyph. Left and Right Arrow move the glyph 1 pixel in a direction. Shift + Left and Right Arrow move the glyph selected 10 pixels in a direction. Enter submits

the user's results for evaluation. Once the user submits their placement of the glyphs, a comparison visualization and score out of 100 points is presented to the user. The more closely the user's glyph placement matches the font's spacing and kerning parameters, the higher the score. Users can toggle between the solution, the user's spacing, and both together with the correct solution highlighted in a blue with a hex value of 3797FF. The user may then select the "next" button on the bottom right to proceed with the next word for spacing. This process repeats, with increasing complexity in the glyphs to be spaced properly. At the end of six sessions, a pop-up box appears with a final score out of 100 points, the average score of the sessions. Below the user's final score is a "call to action" (CTA) button to tweet their score. Below the button is a text link to play the game again, followed by information on the creator of the game, Methods of Action. The CTA button helps promote the social contagion of users visiting the site and sharing their own results online, relying on the motivation of a user to publicize their typographic acumen to peers. Likewise, the secondary information acts as subtle content marketing for other educational design games developed by MacKay, covering other design topics, such as vector paths, Bézier curve position, and color theory.

ii. Primary Research

The author designed a website to present the prompt parameters for creative font pairing. When a user visits the webpage, they are provided functions to set the prompt difficulty, review the required parameters, set a timer to introduce a time constraint into the activity, upload their finished design, and lastly review their work, an AI rendition of the design according to the same prompt parameters, together in a gallery section with other users. To validate the website's utility and value proposition, the author recruited beta testers via social media and the author's own email contacts. Six individuals

anonymously visited and used the website. Five users completed the design sprint session and uploaded work to the gallery section of the website. A six-question survey was filled out by the beta test participants.

The author then created a three-question survey to review the effectiveness and quality of human-made and AI-made artifacts, in order to determine the effectiveness of randomized prompts for font usage creativity: the first two questions regarding design effectiveness with a binary "yes" or "no" choice. The third question was a 1 to 5 Likert scale for visual interest of the design, with 1 signifying "boring" and 5 signifying "interesting." The author then sent the survey by email to an audience of creative professionals and design students. Twenty individuals anonymously reviewed 45 artifacts produced in the 90-minute design sprints. 20 artifacts were AI-made posters and 25 were human-made. Of the 25 human-made posters, 21 were designed by the author and 4 by beta testers of the Font Flow website.

E. Conclusion

From the research reviewed collectively, we can speculate that a prompt generator based on a scaffold of increasing formal and concept complexity paired with a social feedback mechanism would habituate more sophistication in typography usage and visual surprise in visual communication.

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CHAPTER 3

Visual Process

A. Overview

This project entailed three major aspects, which I will first describe generally. Following my overview, the planning, production and challenges of each phase will then be discussed.

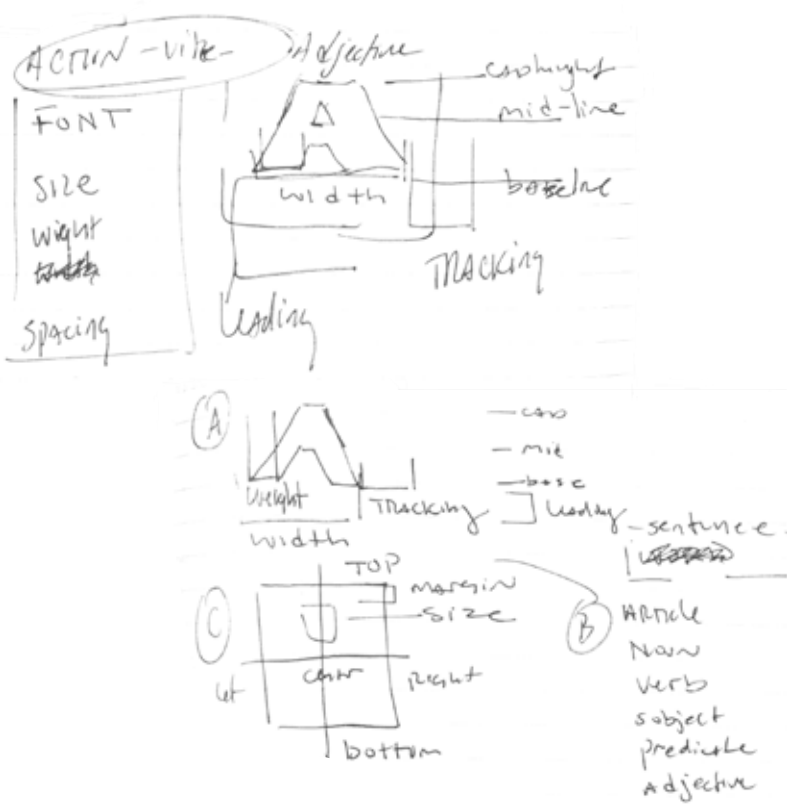
The first aspect of this project is my personal experience producing 24 posters based on prompts provided by the Font Flow website. The prompts were designed to incorporate formal and conceptual elements into the design product. An important aspect of the formal prompt was the selection of headline and subhead fonts for the lecture poster. These font choices were then qualified by linguistic and relational elements.

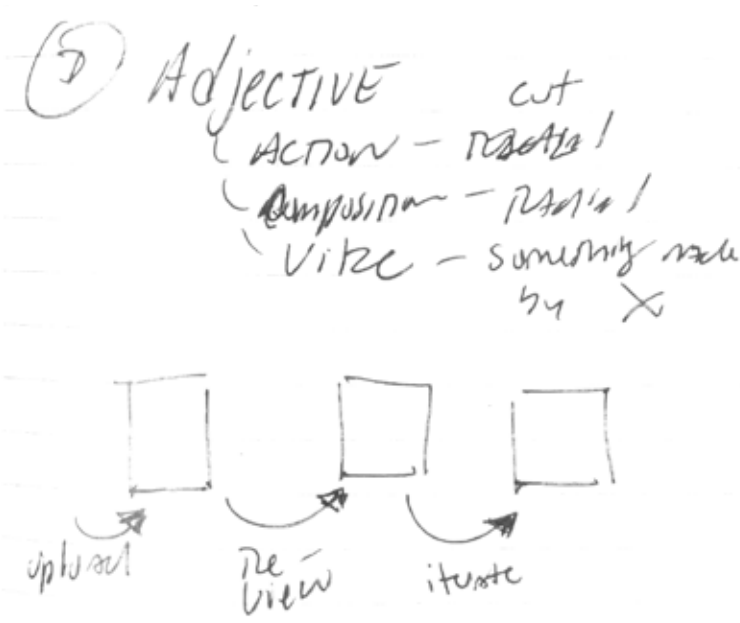
The second aspect of this project is the website. Users are presented with time-constrained prompts that describe formal and conceptual parameters for a hypothetical lecture poster. Users upload their finished designs to the website, which then generates an AI-made poster using the same parameters as the human user. The human-made and AI-made design are then both uploaded to the gallery for users to see. Uploads are anonymous, so a user visiting the website is not certain whether a given design is human- or AI-made. A small user feedback survey was conducted; feedback from the survey informed adjustments to the website.

The third aspect of this project is an online user survey (n=20) conducted to review the quality of the human- and AI-made lecture posters. The survey contained 45 posters: 20 AI-made, and 25 human-made, with 21 of the human-made posters designed by the author. For each of the posters, the users responded to three questions: 1. Could they tell the content of the lecture from the poster? 2. Could they tell where and when the lecture is to occur? 3. A Likert scale 1 to 5 for visual interest of the poster.

B. Prompt Architecture

At the core of this thesis is the prompt architecture used by the author to design his posters as well as for the AI-produced designs. The architecture is informed by the case studies reviewed in chapter 2. From TypeCooker, the progressive disclosure of increased parameters tied to experience was applied to the Font Flow experience setting. As the user moves the slider from level 1 to level 3, the number of parameters for the user to include in the design sprint session increases.





The prompts are divided into four elements: theme, headline font, subhead font, and content of the poster. The content prompt element contains ten hypothetical lectures from different departments of a university. Each content element has a headline, a subhead, a location, and a date and time. The historical-aesthetic references as used in TypeCooker prompts were incorporated into the theme component of the design prompts. Brian Eno's Oblique Strategies was a source of inspiration for the action prompts also incorporated into the theme component of the design prompts. The general list of 100 fonts was extracted from Google Fonts, chosen for its open-source license and availability. Together with typeface and font names, generic descriptors like "any sans serif" were also included in the list to allow for more generalized selections by the user. The decision to include typeface, font, and genre names

in the dictionary stemmed from the diversity of naming conventions in font organization. The headline and subhead font are randomly selected from the dictionary of Google fonts available in the list. However, the headline and subhead font prompt elements have different qualifying treatments. Bethany Heck's font pairing entailed a deep relationship with linguistic or use function: a change in font parameter was indicative of a linguistic difference (e.g. articles vs. nouns) or a difference in function (e.g. for selecting vs. for reading). The linguistic parameter was used for the headline font qualification. At the third level of prompt difficulty, the subhead font is also qualified by a relation to a content unit, be it the headline, the date, or the location.

c. The Author's Experience Using Prompts

During the second week of thesis production, I was generally pleased with the use of the prompts. The interaction between the conceptual prompts and formal typographic prompts resulted in visually interesting and diverse design artifacts. I found myself surprised by some of the creative nudges the historical or conceptual prompts made to his design process. This was especially the case when unexpected historical figures or references such as "Abstract Expressionism of Mark Rothko" or "Interior design of Arne Jacobsen" appeared in the prompts.

The typography prompts forced me to notice particular qualities of typefaces he did not notice prior to the design sprint: that Libre Franklin is in fact rounded at its terminals, for example. This quality was leveraged to connect the grotesque Libre Franklin with the rounded sans serif Omnes. In addition, having to use the script font Pacifico as the headline with the concept prompt of "something like Abstract Expressionism from Mark Rothko" resulted in the author thinking about the texture and materiality

of handwriting referenced by Pacifico, together with the ephemeral dreamy color quality of Rothko's paintings to connect to the soft effervescent quality of happiness.

During the third week of thesis production, I continued to use the prompts to build on work from session 8 to 14. I was particularly pleased with session 10, which had a Paul Rand reference, session 12, which had a Caravaggio reference, and session 14, which had another Rothko reference. The artistic/historical reference paired with typographic and layout parameters resulted in interesting visual solutions. The later sessions motivated me to explore texture, material, and distortion using rapid Photoshop methods to meet the 90-minute session limit. The time restraint forced me not to waste time and find the most effective method to achieve a formal goal.

During the fourth week of thesis production, I developed four more designs. I my view, the successful rendition was session 15, which included a De Stijl historical-stylistic reference as well as successful typographic pairing and interaction with image. During the fifth week of thesis production, I developed 3 more designs. I found the most successful rendition was session 17. In session 17, the typography parameters made for a good font pairing and an interesting formal qualification for the headline font. In the sixth week, three more designs were produced, with mixed results in my opinion.

D. The Website

Building the website for Font Flow was a significant challenge. Over a period of five weeks, I developed a functional website for users to receive the typography prompt, set a timer for the design sprint, upload the poster design, generate the AI rendition of the prompt, display the two designs in a gallery, and finally allow the user to discover whether a work is AI- or human-made. What follows is a

log documenting the process and challenges entailed in designing the website..

January 15th

A initial layout for the prompt parameters was developed using HTML and CSS. The design is extremely disordered and unclear.

January 17th

The framework Next.js is selected to develop a React website/app. The author selects React because the components feature available in React allows for sophisticated interactions outside traditional HTML and Javascript. For example, components and libraries are used to produce a function that randomly selects from a dictionary of prompt attributes. There are significant delays in installing all the dependencies requires to use Next.js, but once they were installed, the author is able to proceed. .

January 21

The UI of the website is clarified. The use of filter:blur() to remove visual noise and a more modular layout of the prompt elements allows for a clear visual hierarchy and user flow. Outline type matches with the visual quality of the modular prompt elements, which draws attention to the prompt information and the finished designs.

January 24th

Using client components, data from the prompt dictionary can be passed into a webpage and displayed dynamically there. Data can be stored with useState, and useEffect watches for a change in data and runs a function. For example, the URL is updated with the prompt level setting, which also affects what prompt text is visible to the user.

January 27th

To introduce the timer function, the open-source usehooks-ts library is used for its countdown function, and pretty-ms, a second library from npm, is used to convert the millisecond time units used in usehooks-ts to the more human friendly format of 1:30:00.

Feburary 4th

Supabase is selected as a quick-to-use database to hold the uploaded design sprints and the AI-generated designs. These designs will be stored in a prompts database table. An environment variable is used to store the Supabase database URL and API key. A upload button is created to connect the upload from the user's web browser to the database. To upload the files to the database, an explicit URL name is required. To do this, we need to append a new name to the Supabase URL that will store the image. Supabase calls these image storage collections "buckets." The author searches for an open-source library to handle the random naming function. Initially he finds the library Holi, but for his React setup, the library is not up-to-date, so it has to be replaced with another library, randomName.

February 6th

The Font Flow website repository is created on GitHub. The GitHub repo is used with Vercel to develop the website and deploy it to a server. The upload function is tested, and bugs in the Timer function are fixed. Media query CSS properties are added to the website for use on phones.

February 7th

A bug in the component for prompt generation is corrected: a rehydration error was causing the server side components to re-run the lodash randomizer.

An initial solution suppressing the hydration error was causing the UI DOM to keep the old data, resulting in many hours of confusion debugging the site.

February 9th

The Ideogram API is added to the prompt upload function. This allows for the prompts used by the human designer to be passed to Ideogram to produce a AI-made poster with the same parameters. Also, various updates to the route and upload functions are made to allow for the successful generation of an AI-based design and upload to the Font Flow database. When a user uploads their design prompt, the website also sends the prompt to Ideogram's API to generate a poster design.

February 12th

There is a bug in the Ideogram API ping. API post works locally but is coming back as a NULL error on the deployed website.With the use of console logs, the author is able to verify whether the API is hit and what it returns. He discovers that the issue was forgetting to add the Ideogram API key to the Vercel deployed environment file.

February 13th

A user feedback function is added to the website. Users now see selection buttons for each uploaded poster for human- or AI-made. When the user selects an answer, they are visually informed if they have answered correctly. If the user selects the correct answer, the image card with the design nods in a joyful agreement with a pleasant up and down movement; the card also glows in light green, then blue, and finally rests as a green outline. Meanwhile, if the user selects the incorrect answer, the card shakes in disagreement with a stiff and sudden sideways movement and a glowing red outline. The button is then disabled from being selected again during the session.

February 17th

The database is now cleared of all prototype testing images and filled with work. Design sprints 1–20 are added to the gallery together with AI-generated designs. Beta testers are recruited to use the Font Flow website by producing a poster according to the prompt, uploading the work to the website, and interacting with the gallery section of the website. A user survey on Google Forms is used to collect feedback from the users.

The survey contains the following questions: a multiple-choice question about the experience level of the participant; a 5-heart Likert rating question on the overall experience of the website; a multiple-checkbox question on the strong points of the website; a multiple-checkbox question on the weak points of the website; an optional text section to explain the strength and/or weakness of the website experience; a question about what audience would love the website; a multiple-choice question asking if the user experienced a moment of surprise using the website. Based on the answers by the survey respondent, the survey either shows a section if the user experienced a moment of surprise, or a section if the user was not able to upload a work to the gallery. For the surprise section, the first question is a Likert scale rating the quality of the surprise the user experienced from 1 to 5, with 1 representing a bad/upsetting/annoying surprise and 5 a good/fun/enjoyable surprise. The user is then asked to describe the experience of surprise, and if the author may contact them for a one-on-one follow-up interview.

February 18th

A gallery card error is corrected. The wrong dictionary term was used for the gallery card, so some database parameters were not showing on the gallery card view. This was a minor error that did not affect user interaction.

March 2nd

The website is adjusted with a disable function as users upload their work to the website. This prevents users from uploading their work multiple times, which was an observed pattern among beta testers using the Font Flow website.

March 3rd

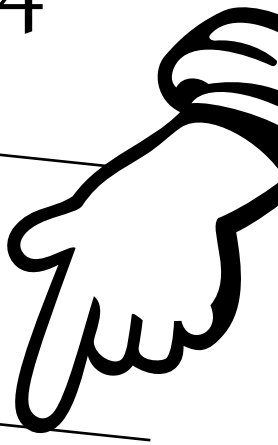
Descriptive statistical analysis of reviewer data of poster designs is conducted. This will now segue into the third aspect of the thesis project, the online review-survey.

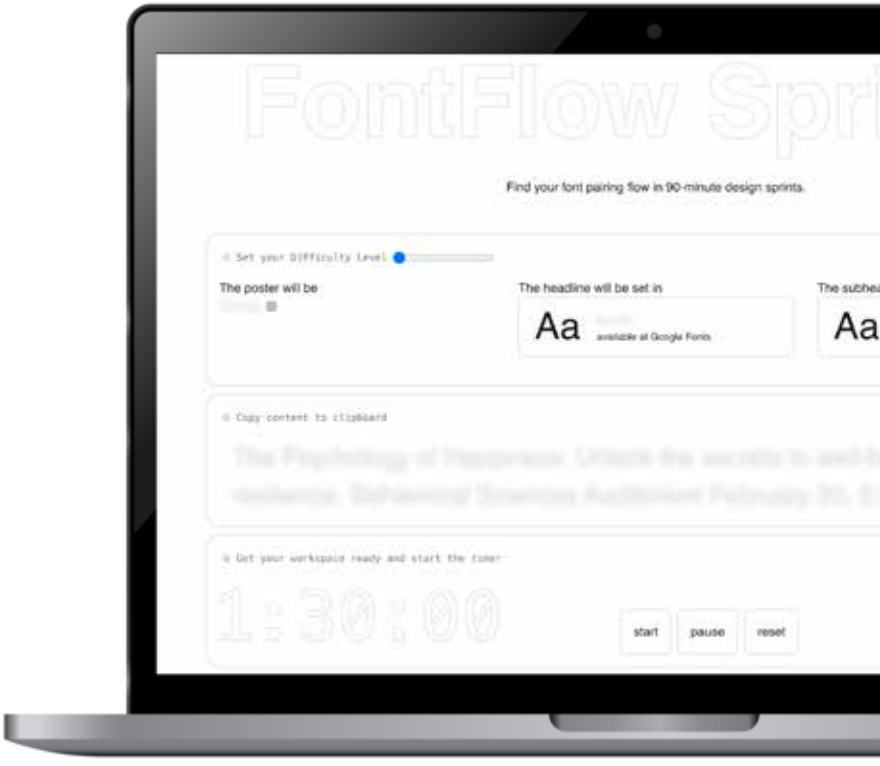
E. The Review–Survey of Produced Posters

I created a Google Form showing 45 posters: a mix of 20 AI-made posters, 21 posters made by the author, and 4 posters made by beta testers. Twenty participants answered the survey. Ten respondents were professional designers. Nine were design students. The survey asked viewers three questions: 1. "Do you know what the lecture is about?" 2. "Do you know where and when the lecture will occur?" The first two questions are presented as binary yes/no options, with a "yes" answer converted to a value of 1 and a "no" answer to a value of 0. The average of the user answers is then calculated to produce a percentage value for a poster's degree of content legibility (so if all the users answered yes to the content questions, the average value would be 1, and therefore 100%. If the average from the users were .8, the percentage would be 80%.) 3. A Likert scale rating the visual interest for the poster from 1 to 5, with 1 meaning that the design is boring and 5 meaning that the design is exciting and interesting.

CHAPTER 4

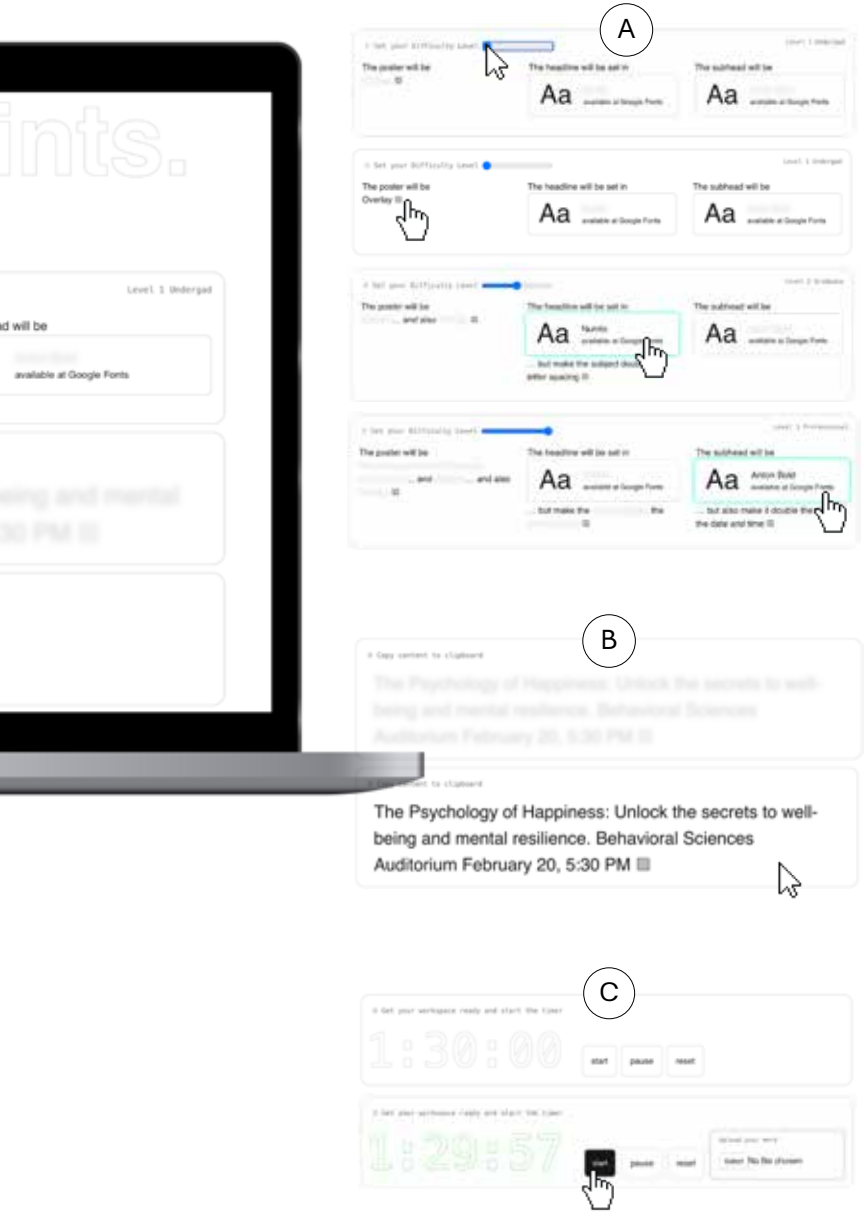
Final Solution





A. Final Soultion

Above is the final Font Flow website, which generates prompts and is where designers uploaded work. Each design completed by the author is presented with its prompt parameters. Following the author-produced designs, the beta tester designs are presented, accompanied by their prompt parameters. Last, the AI-made designs for each prompt are presented.

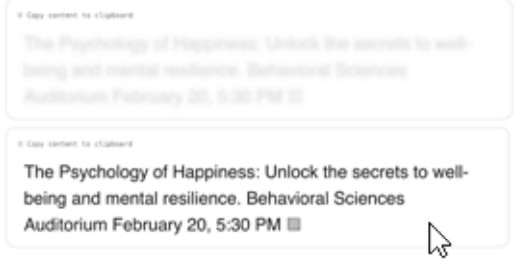

A
B
C
The Psychology of Happiness: Unlock the secrets to well-being and mental resilience. Behavioral Sciences Auditorium February 20, 5:30 PM
1:30:00
1:29:57

DIFFICULITY SETTING UI

User selected prompt complexity is infromed by the TypeCooker website UI.

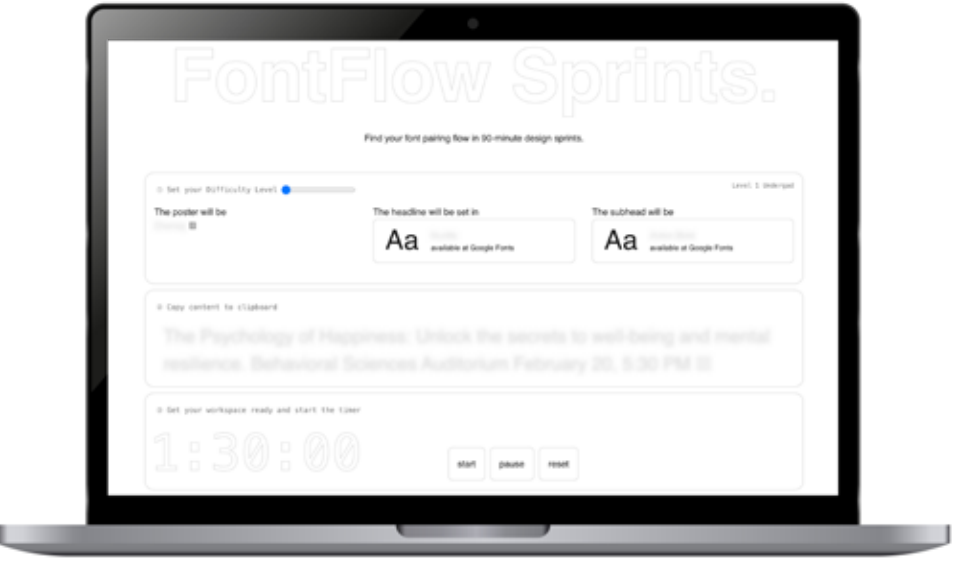
USE OF BLUR

Prompt parameters come into focus when the user focuses on the element. The deafult presentation of blur invites curiosity and controls for cognitive load as the user explores the website.



TIME CONSSTRAINT

The ninety minute limit is informed by the UX practice of time constrained design sprints.



TYPOGRAPHY AS TEXTURE

The minimalist typesetting and presentation is informed in the more infrastructural perspective of typography's role in graphic design and UX/UI. The choice of sans-serif and mono-space font-families is informed by typographer Bethany Heck's practice of introducing font pairings according to diverse functions of type. Type to be selected is set differently than type to explicate the design sprint process.

PROMPT

Something made by Piet Mondrian
in Dutch Abstract Art
but Licked *along with*
a Grid with offset layout.

Historical Reference
Verb
Formal Layout

Aa

HEADLINE

Mulish Regular *but make*
the conjunction quintuple
the width.

Lingisutic
Ratio
Font Properity

Aa

SUBHEAD

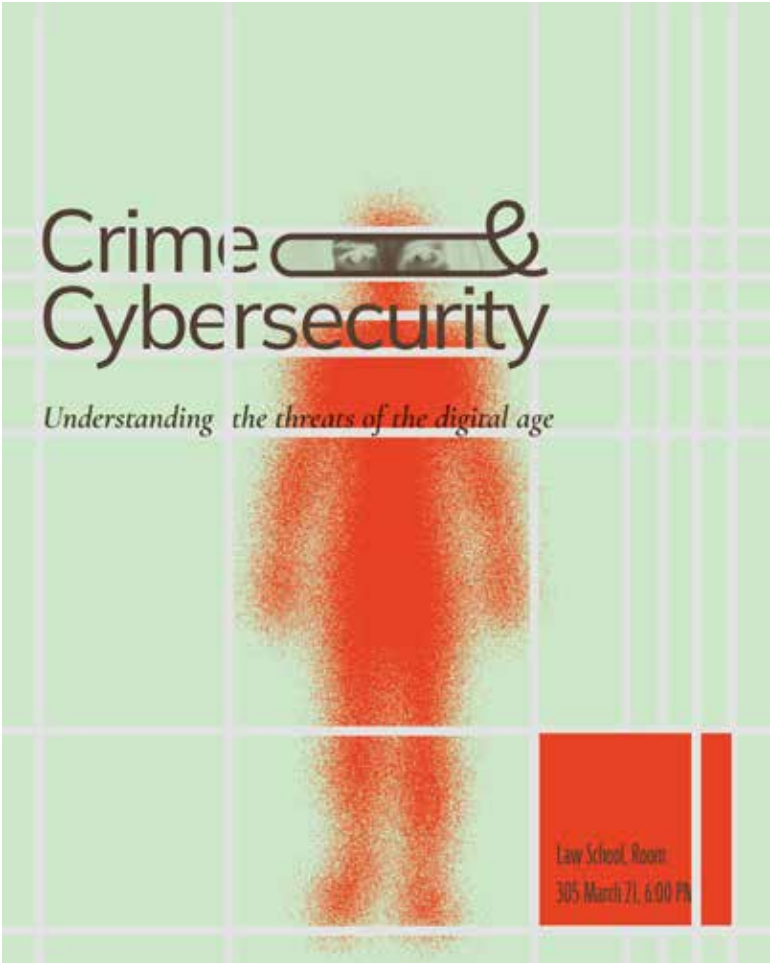
Cormorant *but also make it*
quintuple the width
of the date and time.

Ratio
Font Properity
Content Element

CONTENT

Crime and Cybersecurity
Understanding the threats of the digital age
Law School, Room 305
March 21, 6:00pm

Headline
Subhead
Location
Time


Crime & Cybersecurity
Understanding the threats of the digital age
Law School, Room
305 March 21, 6:00 PM

A Walkthough of Applying the Prompt to a Design

The combination of various formal variables in the prompt was informed by TypeCooker. At the highest prompt level, variation in the font pairings is introduced through the linguistic or content dimensions. The qualifications for the headline and subhead fonts are based on typographic or layout-driven parameters, as outlined in TypeCooker. The prompts presented on the website are structured according to the font pairing practices of Bethany Heck, as seen in the *Golden Ticket* visual analysis.

For example, the conjunction in this prompt needed to be four times the width of the rest of the header content. This required me to directly dissect and expand the ampersand, since a width axis in the font design space did not exist for Mulish. The negative space in the widened ampersand allowed me to integrate a masked photograph of a woman's face. Likewise, the subhead font had to be four times the width of the date and time content. The date and time content was not specified in the prompt, so I had to think through a font that would meet the requirement of being one-fourth the width of Cormorant. I opted to use Agenda One Compressed to harmonize the headline font, Mulish, with the narrower design requirement. I chose Cormorant Italic to narrow the subhead content while still allowing the date/time/location setting to remain legible. The Heck model of font variation—based on content and linguistic criteria—was applied in both the modification of the ampersand width within Mulish and the use of Agenda One Compressed to harmonize the sans serif Mulish with the serif Cormorant.

The thematic prompt of *Mondrian–licked–offset grids* directed me toward an admittedly obtuse synthesis of the grid logic emblematic of Mondrian's work, combined with my personal association of Acid-Rock 1960s psychedelic colors—mint green, red, and an achromatic gray. The typography is set in a dark, saturated shade of the red used in the poster. The offset grid was used

to play with scale shifts between the inverted photographic element and the dispersion-patterned red figure. The gray grid demarcation lines were also used to organize the headline, subhead, and date/location/time information. To add visual interest, the grid lines were interlaced between the content elements to create a sense of dimensionality. The combination of complementary colors, achromatic gray, interlaced grid, mixed-media figure, and the integration of the conjunction in the headline with the figure evokes a sense of discomfort tied to cyber surveillance and scrutiny—the topic of the hypothetical lecture.

Somehow, form and content were synthesized from the randomized prompt mechanism. As reported in Chapter 3, the ninety-minute time constraint required focused attention on converging an intelligible pattern and logic that incorporated all the prompt parameters while still aligning with the normative expectations of a university lecture poster. The typical time allocated for divergent design inquiry was effectively off-loaded onto the randomized prompt structure. When the finalized design was uploaded to Font Flow, the resulting AI-generated rendition clarified the innovation in my design process, particularly through the use of the Heck model of font pairing and variation.

Feedback from Beta-Testers

Six beta testers used the Font Flow website to conduct design sprints, upload their work, and interact with the gallery section of the website. Users reported an error in the upload process: the lack of a disable function plus a limited visual display for upload duration resulted in multiple users uploading their work multiple times to the gallery. This error was addressed by adding a disable function for while the user file is being uploaded. All beta testers reported experiencing surprise using the website. Four of the five beta testers reported a positive-affect surprise using the website. Users reported that their surprise stemmed from the gallery interaction to uncover which designs were AI-made or human-made.

Beta-testers reporting their moments of surprise when using the website

USER 1

Moments where I missed the design as AI when there were clear markers of it.

USER 2

[Where] the part of hit the nail on the head of AI vs human crafted.

USER 3

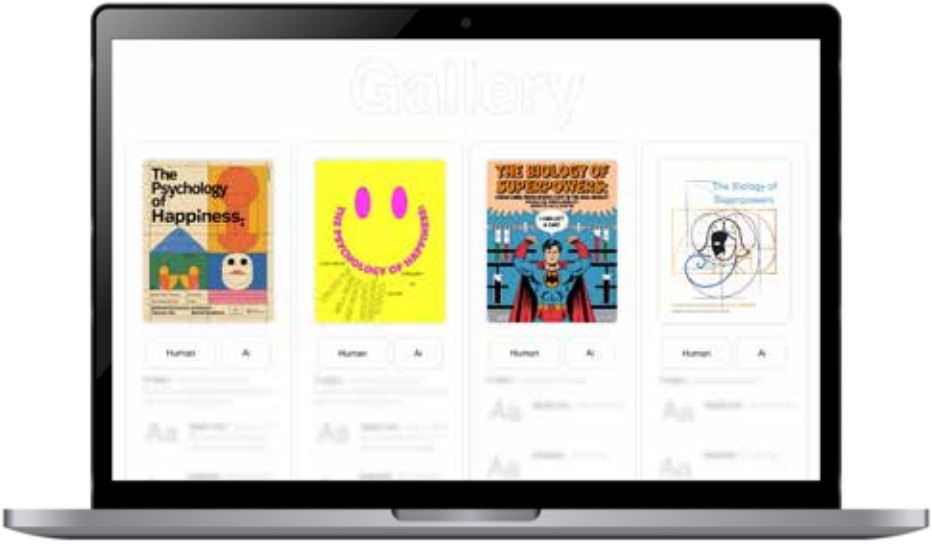
It was harder to find what was AI and what was human! I was like damn, it fooled

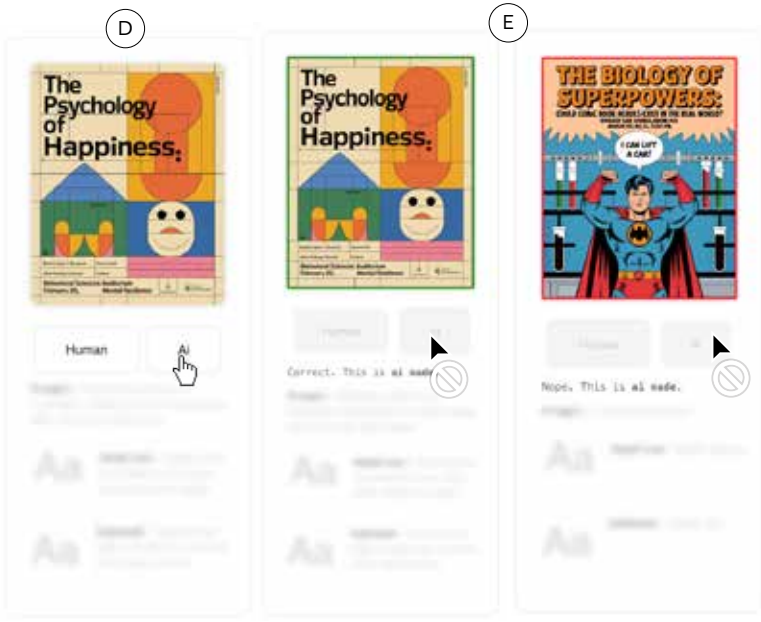
USER 4

Many of my guesses (human vs. AI) were wrong, and I realized that first impressions are not good enough, one has to carefully study a piece for clues.

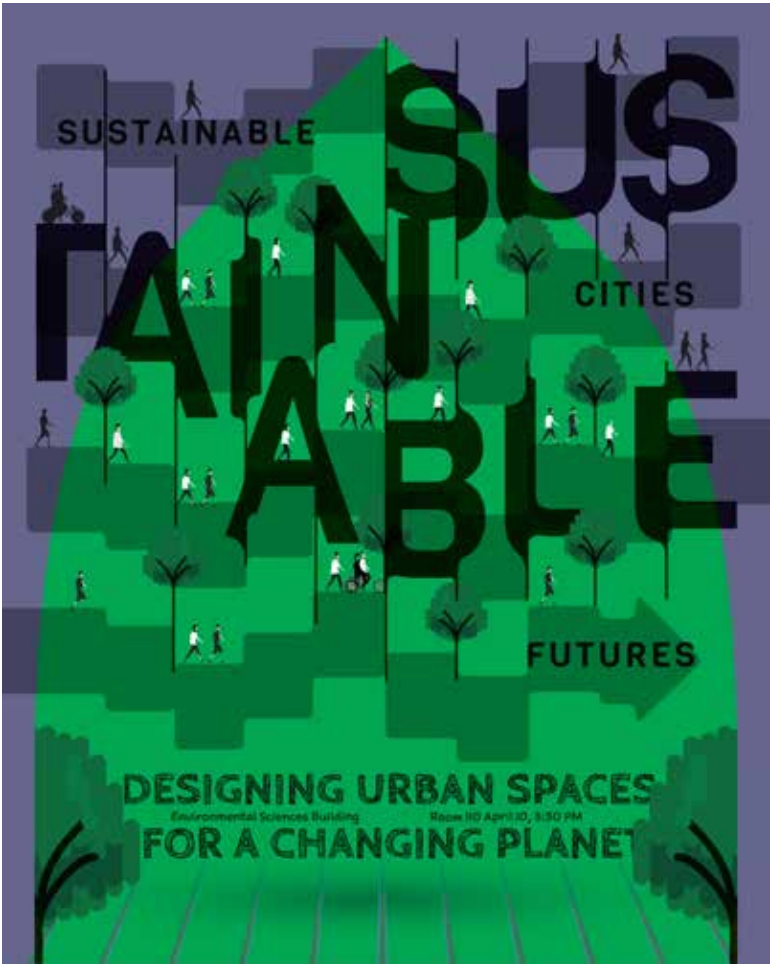
USER 5

I thought some of the posters were made by humans, but they were AI! I also thought the opposite about some of the human posters.


Gallery
The Psychology of Happiness.
THE BIOLOGY OF SUPERPOWERS:
Human
Ai


D
E
The Psychology of Happiness.
THE BIOLOGY OF SUPERPOWERS:
I CAN LIFT A CAR!
Human
Ai
Correct. This is ai made.
Nope. This is ai made.

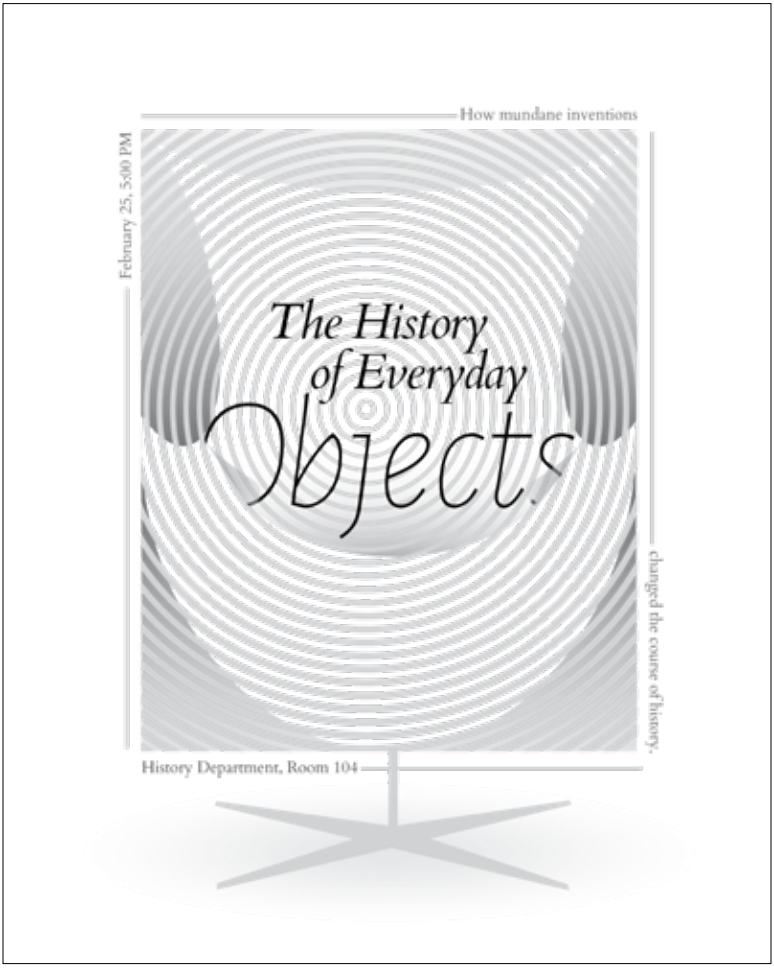
HUMAN ORIGIN



PROMPT Something out of Art Deco but Tripped along with a Banded layout.

HEADLINE Viga but make the clause tenfold the construction.

SUBHEAD Cabin Sketch Italic but also make it tenfold the letter spacing of the venue

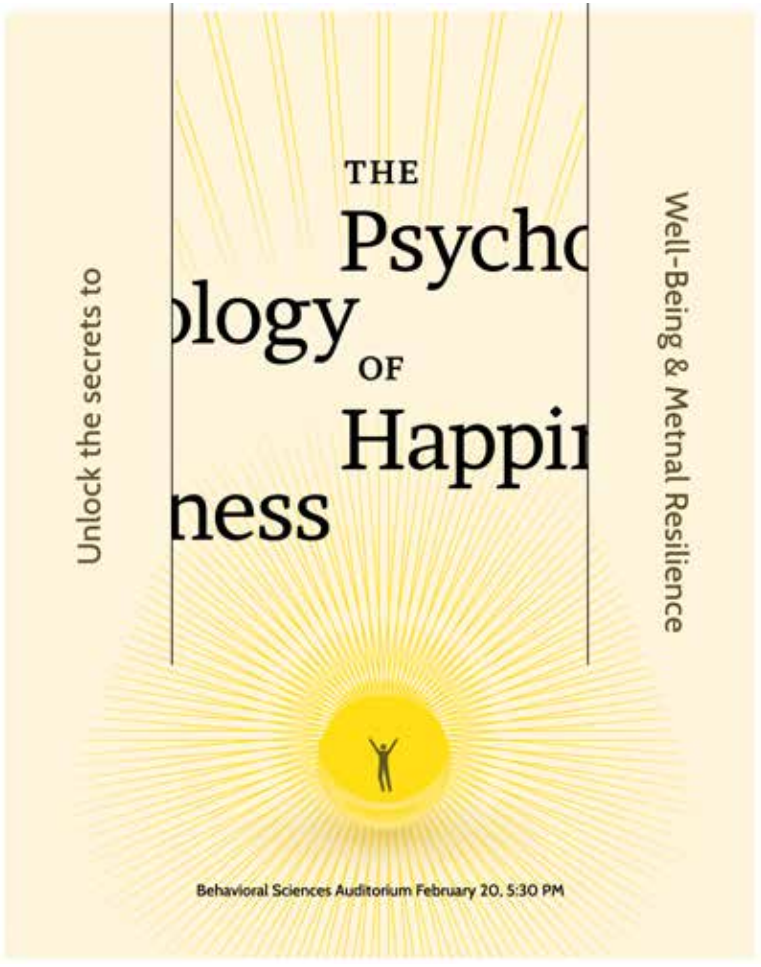


PROMPT Something made by Arne Jacobsen in Modernist Design but Rapped along with a Circular layout.

HEADLINE Cardo Italic but make the noun one third the color.

SUBHEAD Cardo but also make it one third the contrast of the date and time

HUMAN ORIGIN



PROMPT Something like the Aesthetic Movement Design but Swatted along with a Grid with offset layout

HEADLINE Brawler but make the pronoun double the line height

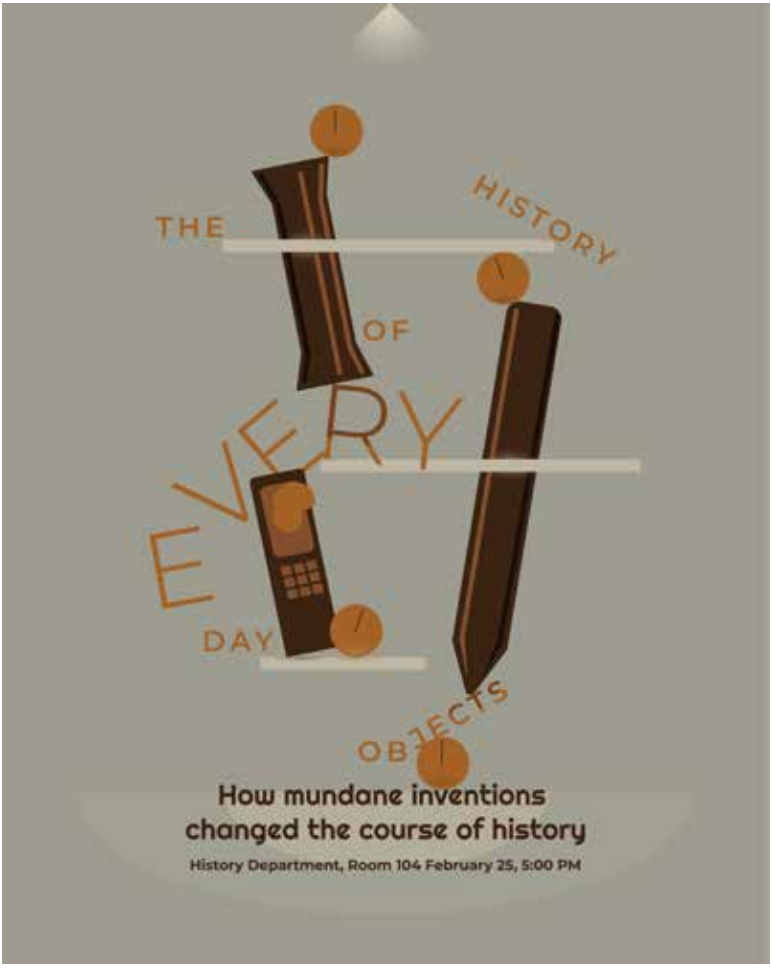
SUBHEAD Cabin but also make it double the alignment of the venueand time

PROMPT Something out of Constructivist Art by El Lissitzky but Fragmented along with a Coiled layout.

HEADLINE Signika Bold but make the clause one third the alignment.

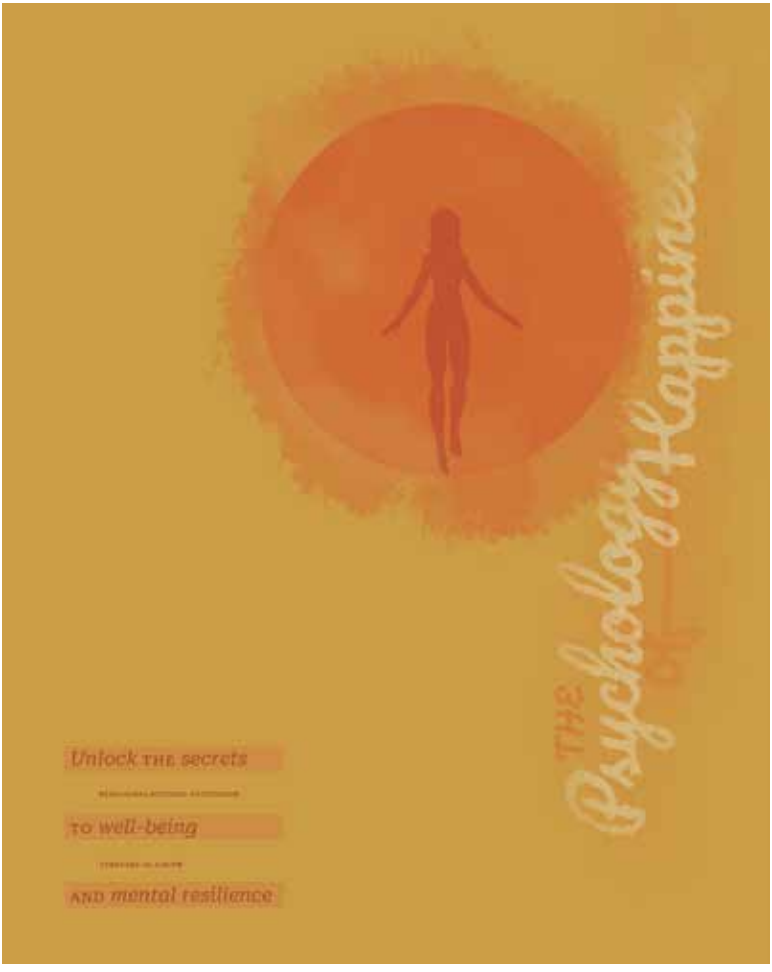
SUBHEAD Crimson Pro but also make it one third the shadow of the date and time

HUMAN ORIGIN



PROMPT Something out of Mid-Century Modernism but Bumped along with a Hexagonal layout.

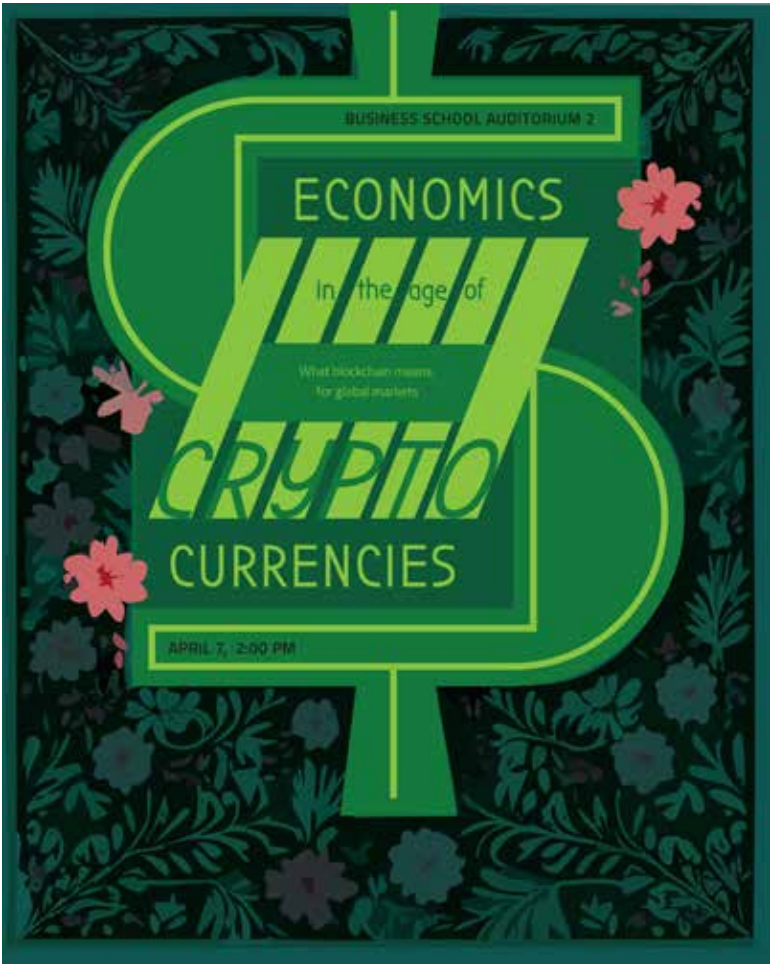
HEADLINE Montserrat but make the adverb one fourth the word spacing.
SUBHEAD Righteous Bold but also make it one fourth the weight of the header



PROMPT Something like Abstract Expressionism by Mark Rothko but Tackled along with a Fragmented layout.

HEADLINE Pacifico Regular but make the conjunction one third the line height.
SUBHEAD Roboto Serif Italic but also make it one third the opacity of the header

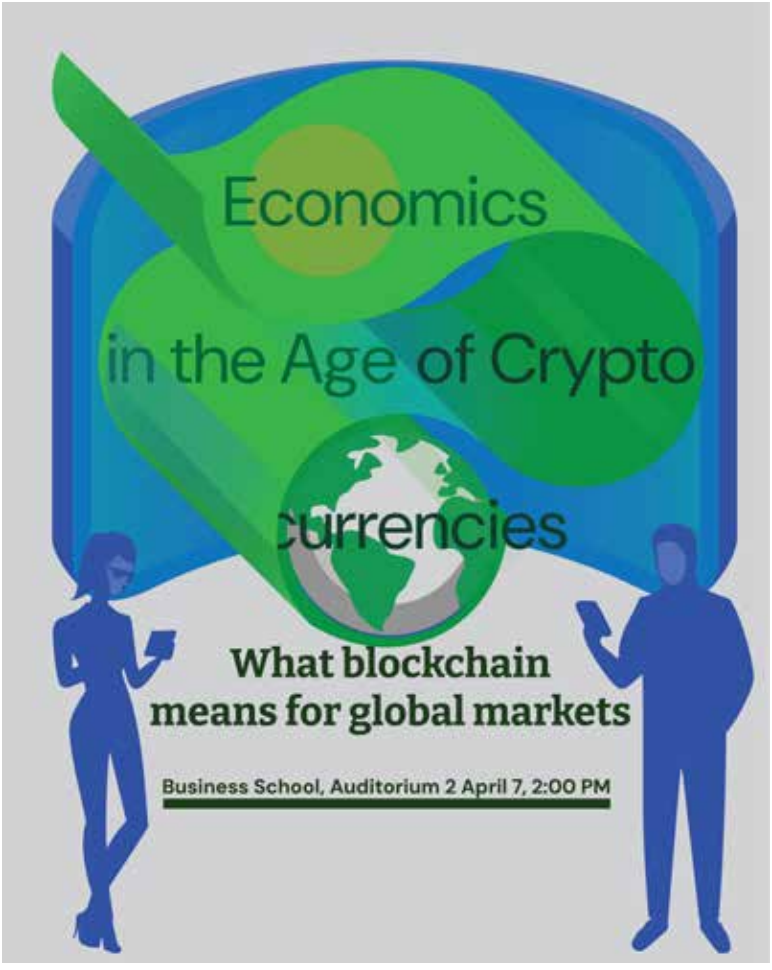
HUMAN ORIGIN



PROMPT Something out of the Arts and Crafts Movement but Tipped along with a Horizontal stacking layout.

HEADLINE Bubbler One but make the adjective quadruple the size.

SUBHEAD Any Superellipse Sans Serif but also make it quadruple the slant of the venue.

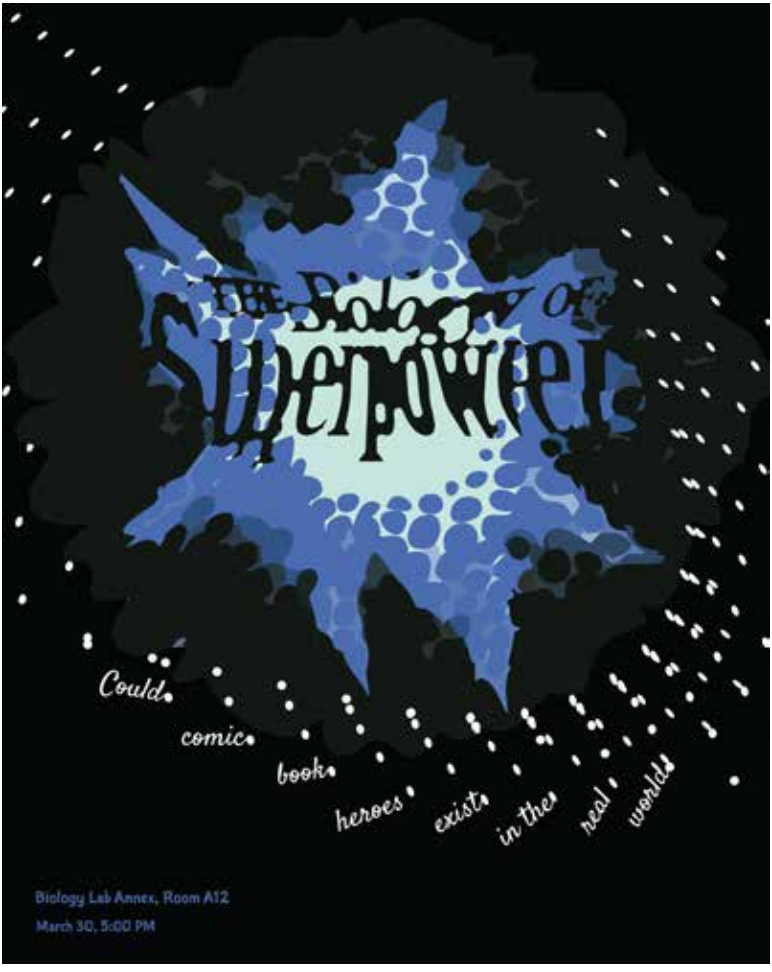


PROMPT Something made by Charles Eames in Furniture but Slapped along with a Split sections layout.

HEADLINE DM Sans but make the clause one fifth the underline.

SUBHEAD Bitter but also make it one fifth the width of the date and time.

HUMAN ORIGIN



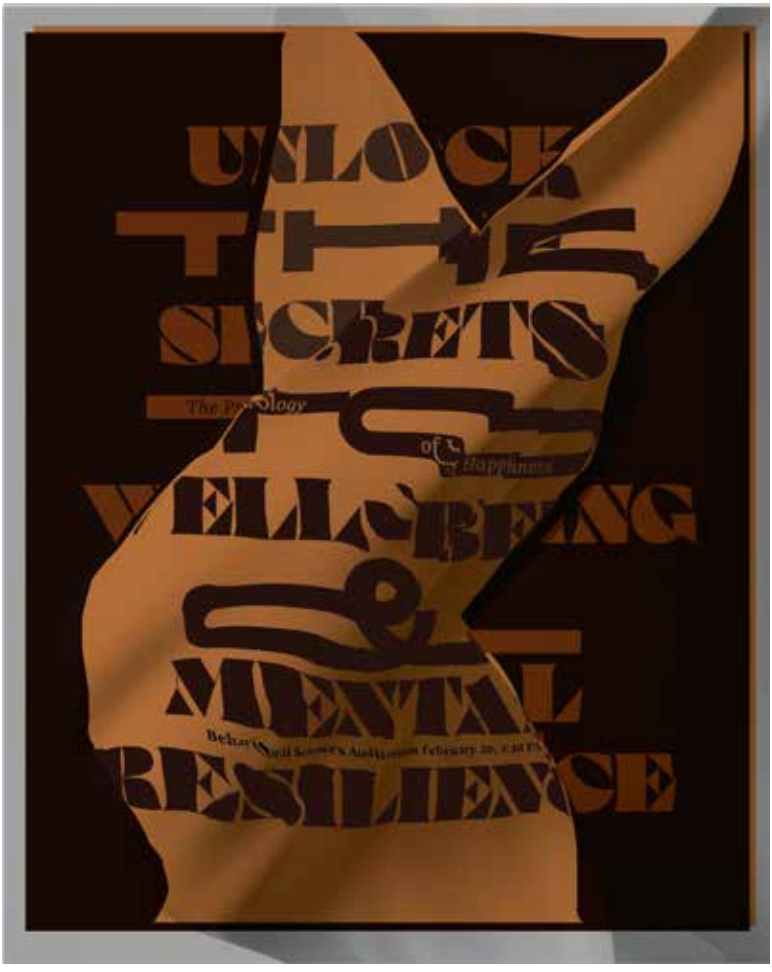
PROMPT Something like Modernist Graphics by Paul Rand but Destroyed along with a Focal point-centered layout.

HEADLINE Crimson Pro but make the subject one third the line height.
SUBHEAD Satisfy but also make it one third the width of the venue.

PROMPT Something made by Piet Mondrian in Dutch Abstract Art but Grabbed along with a Focal point-centered layout.

HEADLINE Source Sans Pro but make the modifier one eighth the word spacing.
SUBHEAD Alegreya SC but also make it one eighth the line height of the date and time.

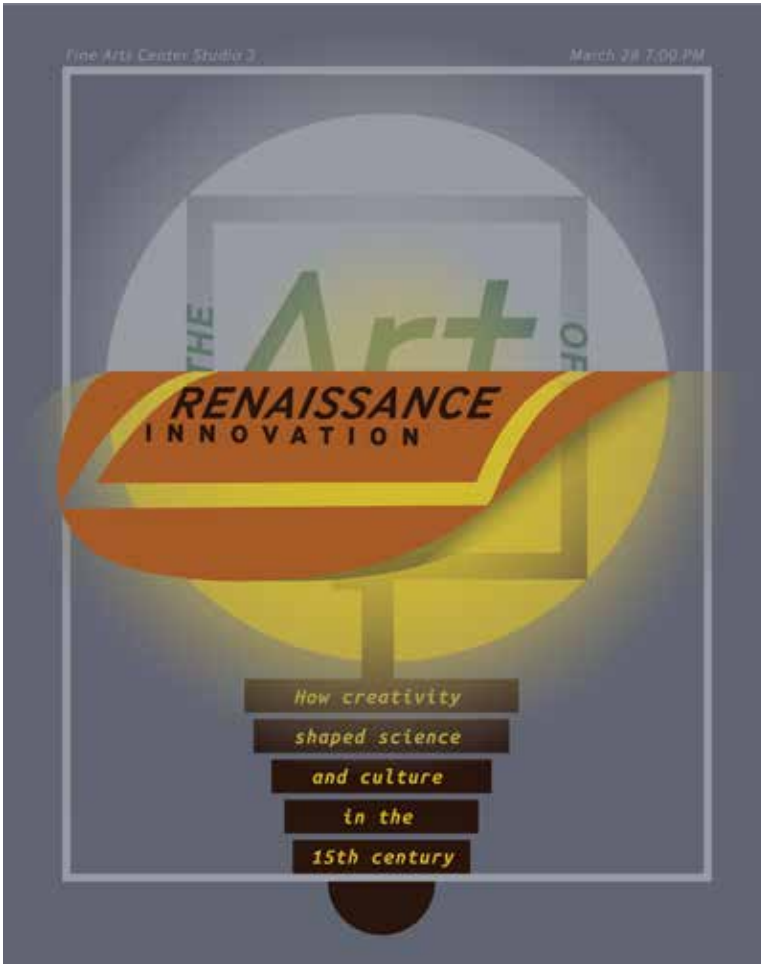
HUMAN ORIGIN



PROMPT Something made by Caravaggio in Baroque Art but Twisted along with a Center-aligned layout.

HEADLINE Rasa but make the conjunction one eighth the size.

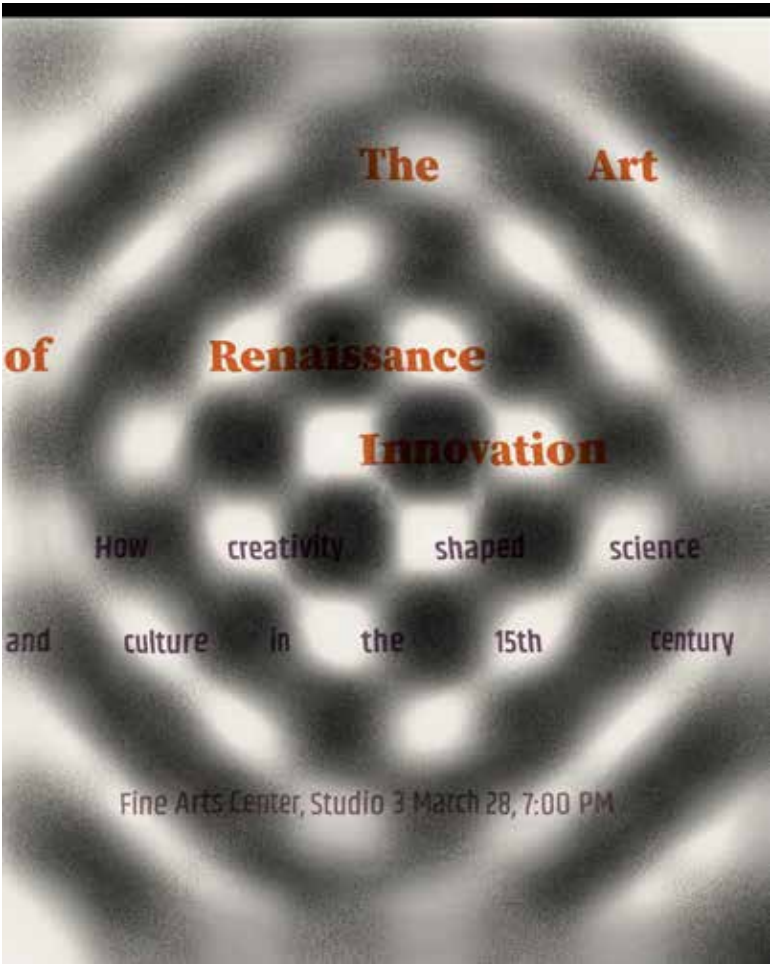
SUBHEAD Any Fatface Serif but also make it one eighth the case of the date and time.



PROMPT Something made by Pablo Picasso in Abstract Expressionism but Bent along with a Centralized layout.

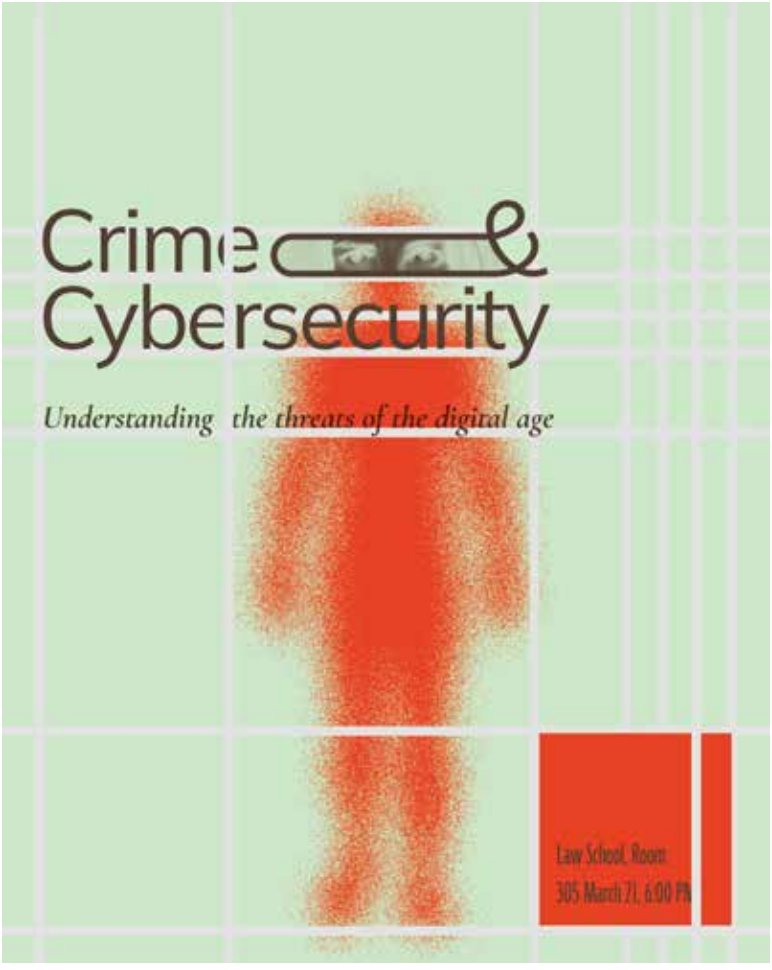
HEADLINE Inter Italic but make the noun one third the contrast.
SUBHEAD Ubuntu Mono but also make it one third the contrast of the venue.

HUMAN ORIGIN



PROMPT Something like Abstract Expressionism by Mark Rothko but Tackled along with a Checker layout.

HEADLINE Source Serif Pro but make the article one tenth the word spacing.
SUBHEAD Khand but also make it one tenth the word spacing of the date and time.



PROMPT Something made by Piet Mondrian in Dutch Abstract Art but Licked along with a Grid with offset layout.

HEADLINE Mulish Regular but make the conjunction quintuple the width.
SUBHEAD Cormorant but also make it quintuple the width of the date and time.

HUMAN ORIGIN

PROMPT Something like Eero Saarinen's Designs but Tugged along with a Unordered layout.

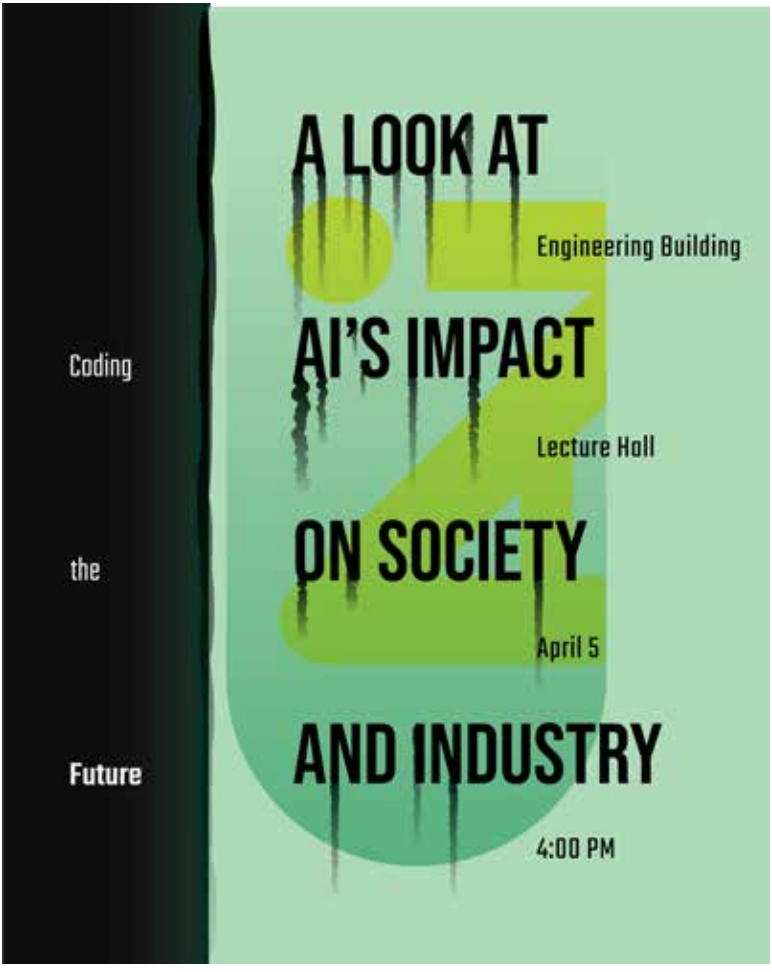
HEADLINE Viga but make the phrase triple the word spacing.

SUBHEAD Overpass but also make it triple the word spacing of the date and time.

PROMPT Something like Robert Venturi's Postmodern Architecture but Throttled along with a Parallel layout.

HEADLINE Rationale but make the pronoun hundredth the contrast
SUBHEAD Fira Sans Extra Condensed but also make it hundredth the opacity of the date and time

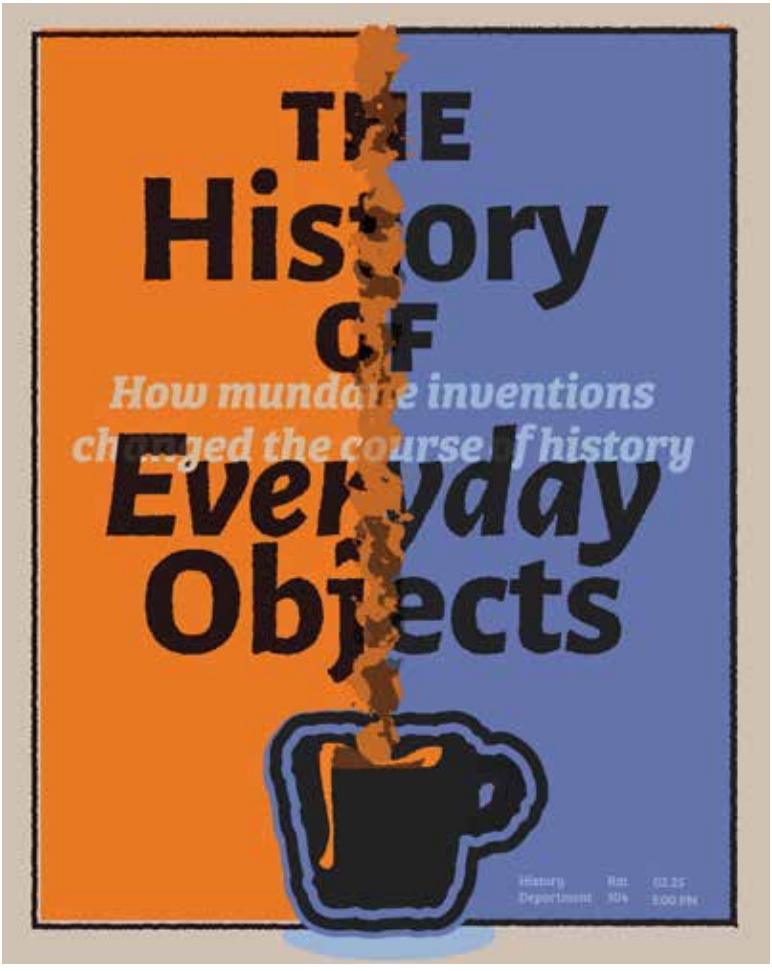
HUMAN ORIGIN



PROMPT Something like Vera Wang's Fashion but Licked along with a Uneven distribution layout.

HEADLINE Teko but make the noun double the weight.

SUBHEAD Bebas Neue but also make it double the weight of the header.

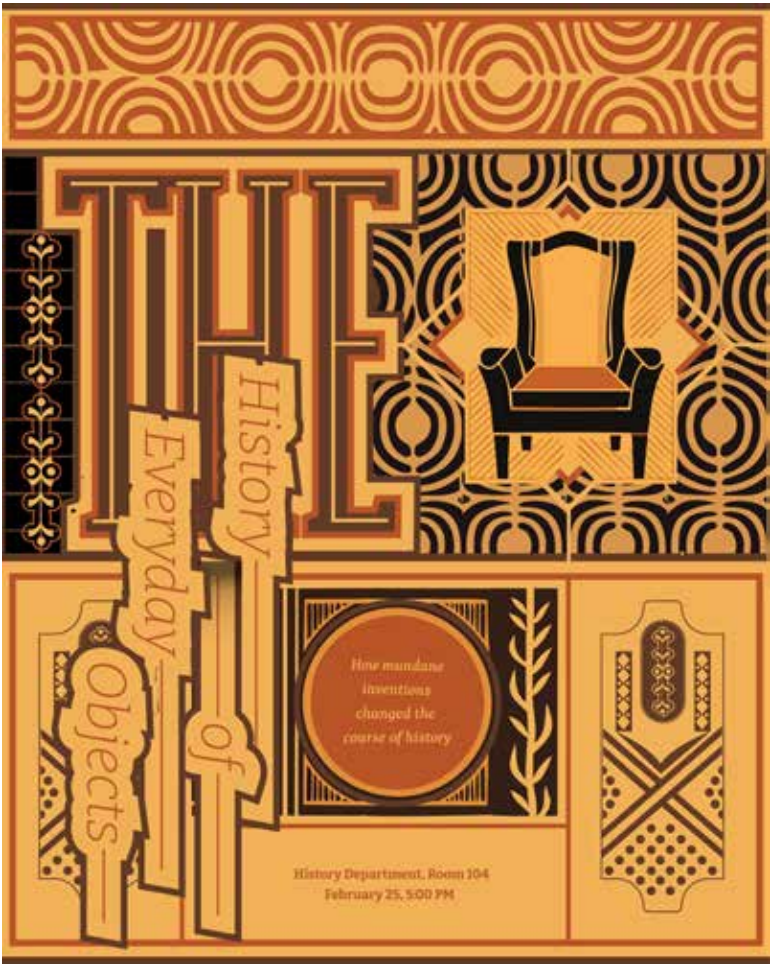


PROMPT Something out of Expressionism in Design but Carried along with a Dual sections layoutt.

HEADLINE Alegreya Sans but make the modifier fourfold the slant.

SUBHEAD Bree Serif Bold but also make it fourfold the underline of the

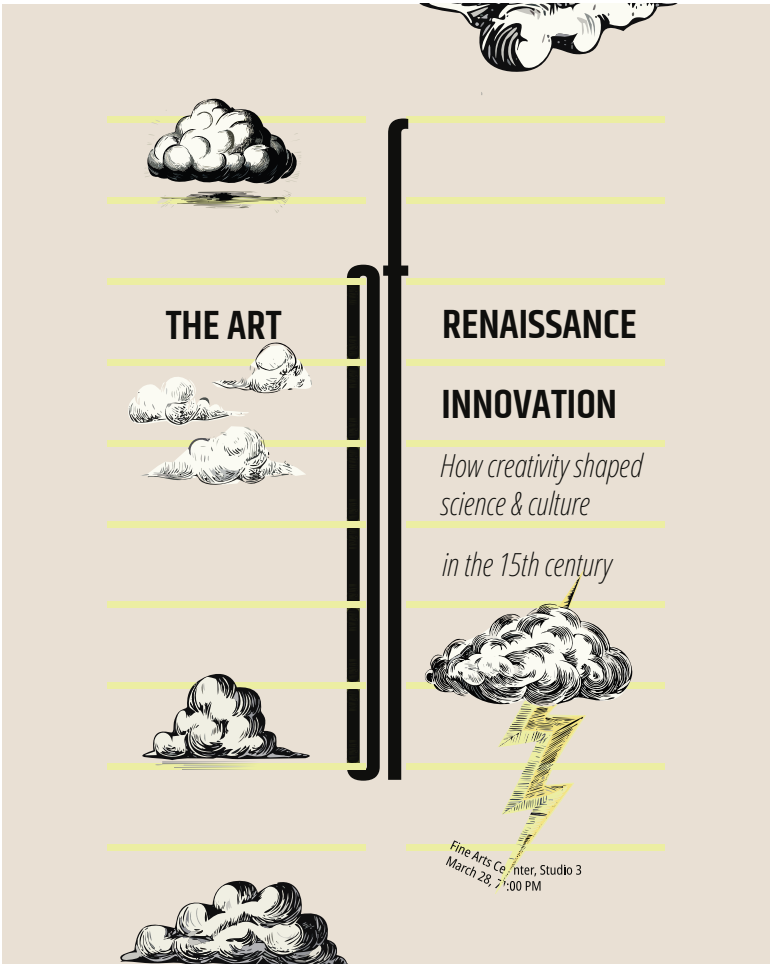
HUMAN ORIGIN



PROMPT Something out of the Arts and Crafts Movement but Crushed along with a Vertical layout.

HEADLINE Bitter but make the article triple the letter spacing.

SUBHEAD Rasa but also make it triple the case of the date and time.

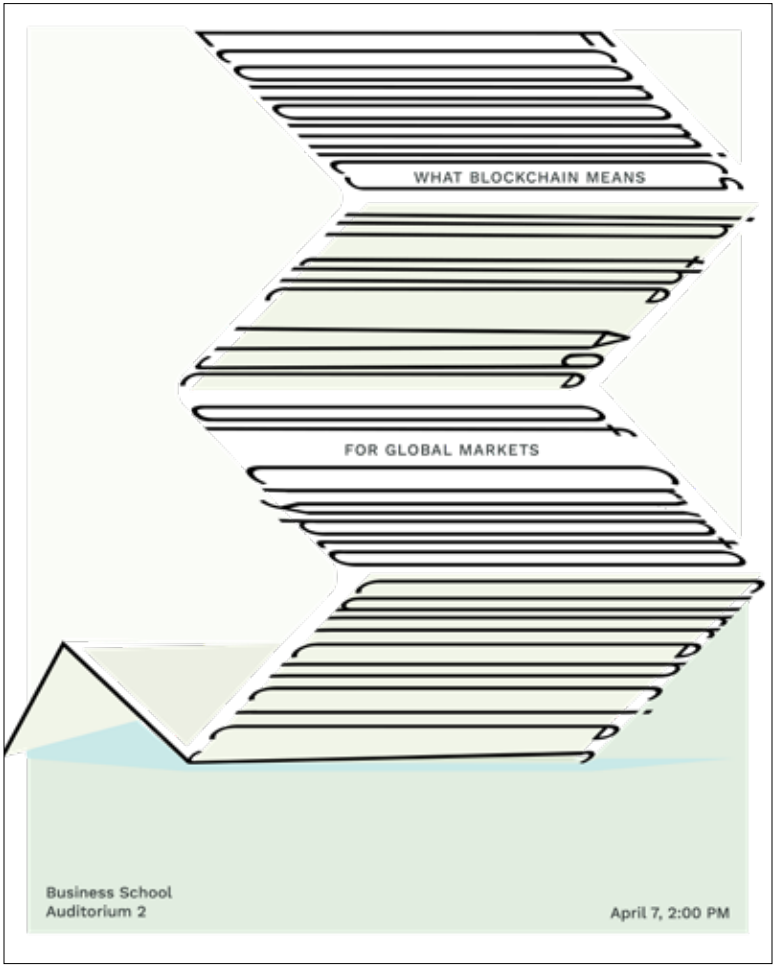


PROMPT Something made by Pablo Picasso in Abstract Expressionism but Destroyed along with a Layered layout.

HEADLINE Khand but make the preposition tenfold the construction.

SUBHEAD Noto Sans but also make it tenfold the construction of the date and time.

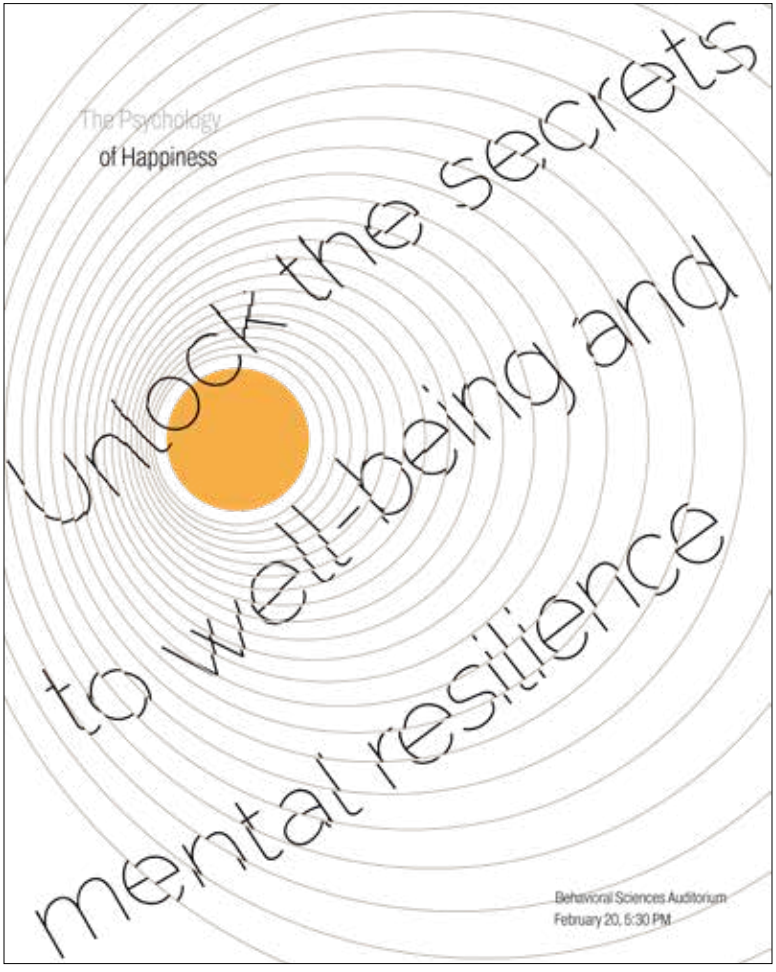
HUMAN ORIGIN



PROMPT Unfolded along with a Unordered layout.

HEADLINE Mulish but make the clause quadruple the case.

SUBHEAD Work Sans Medium



PROMPT Something out of Post-Impressionist Designs by Van Gogh but Shattered along with a Concentric circles layout.

HEADLINE Archivo Narrow but make the first word thrice the slant.

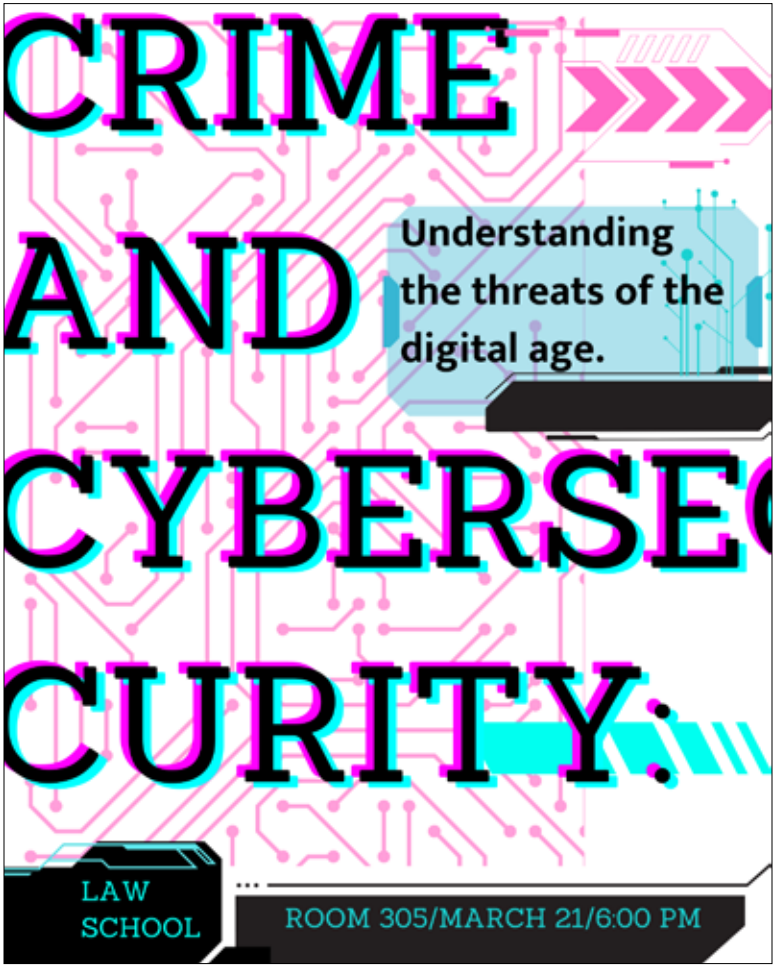
SUBHEAD Raleway Thin but also make it thrice the color of the header.

PROMPT A W-shaped layout.

HEADLINE Arvo Bold

SUBHEAD Syncopate

.

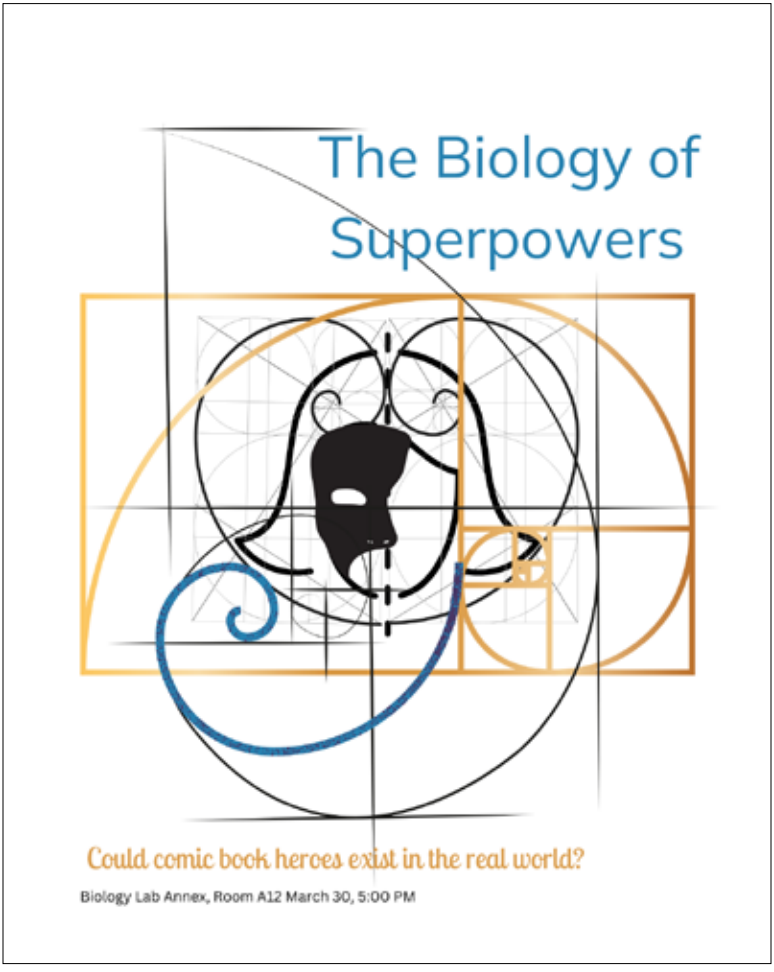


PROMPT Swatted along with a Inset framing layout.

HEADLINE Sanchez but make the modifier half the weight

SUBHEAD Mukta SemiBold

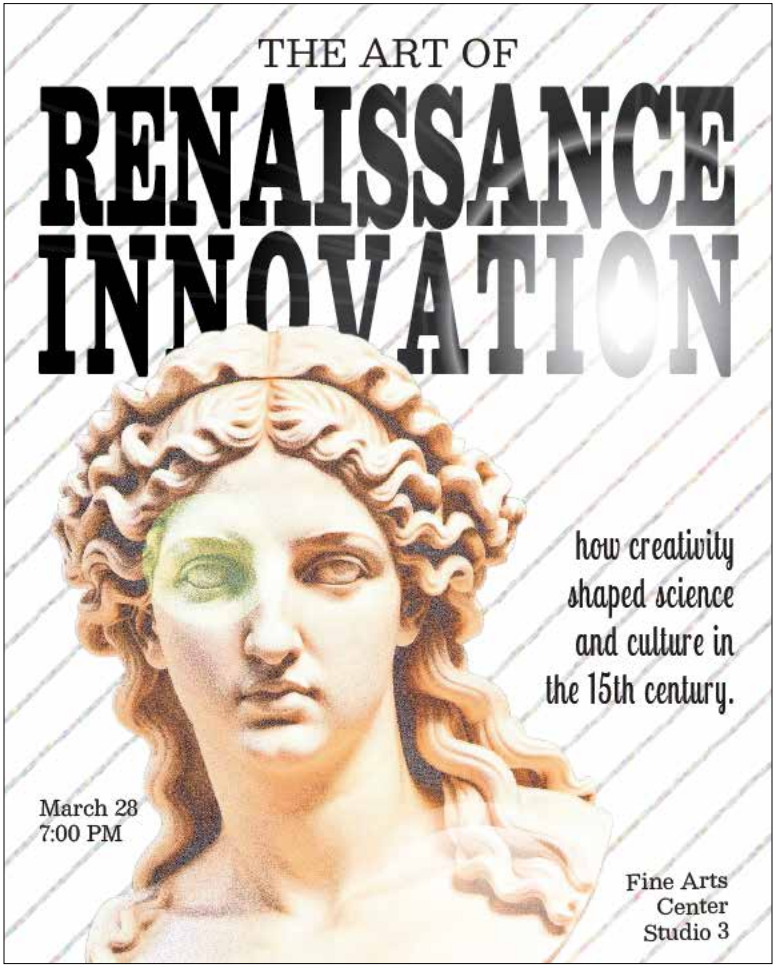
HUMAN ORIGIN



PROMPT A Symmetrical layout.

HEADLINE Mulish Regular

SUBHEAD Lobster Two

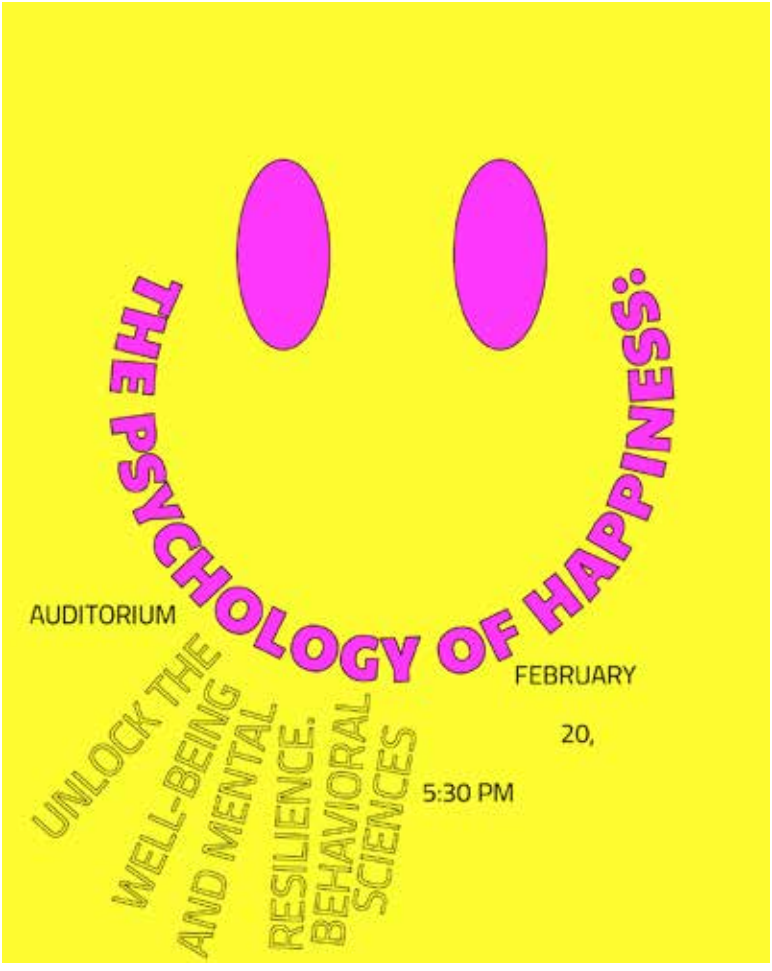


PROMPT A Diagonal stripes layout.

HEADLINE Any Slab Serif

SUBHEAD Lobster Two

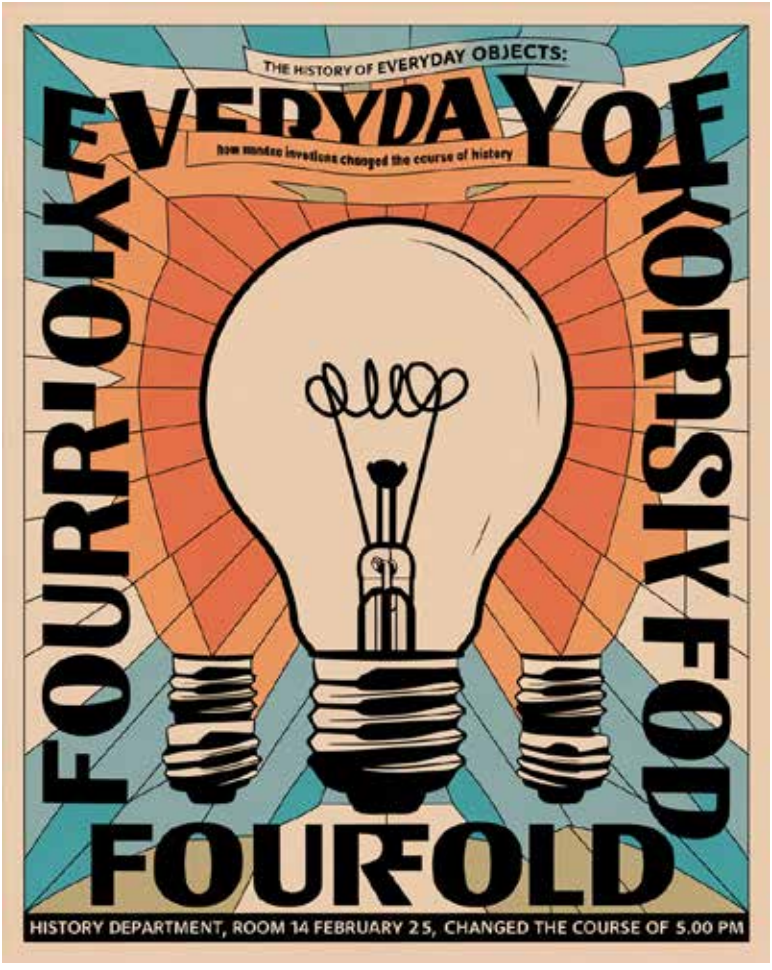
HUMAN ORIGIN



PROMPT Something made by Le Corbusier in Modernism but Flicked along with a Grid with offset layout

HEADLINE Paytone One but make the every other letter double the weight.

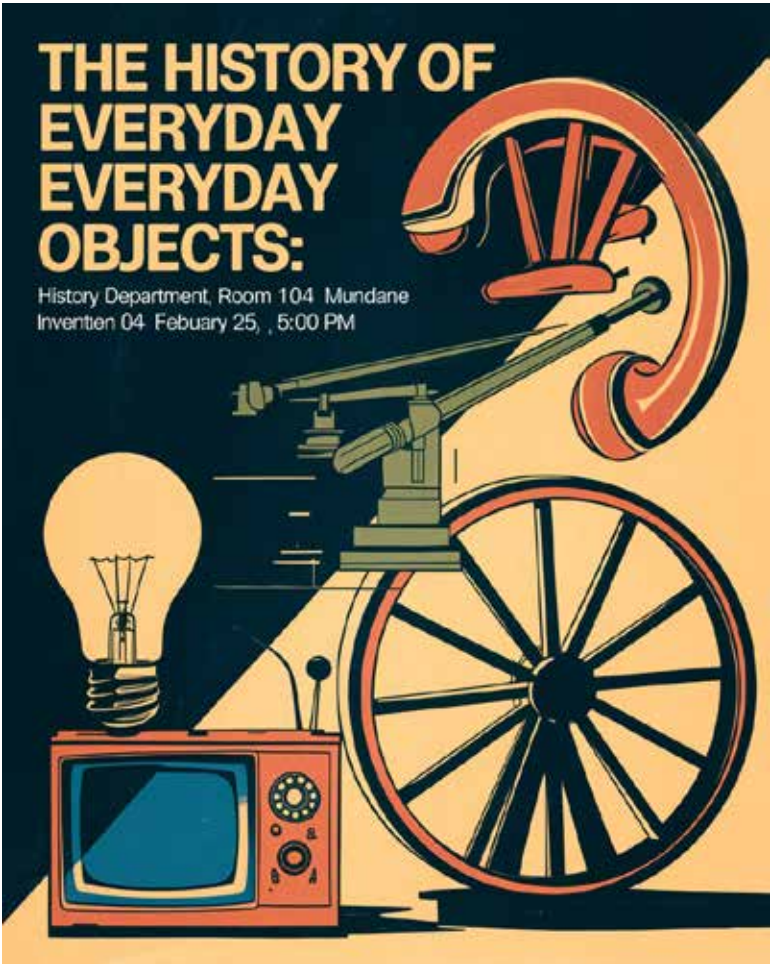
SUBHEAD Cairo but also make it double the underline of the date and time.



PROMPT Something out of Expressionism in Design but Carried along with a Dual sections layout.

HEADLINE Alegreya Sans but make the modifier fourfold the slant.
SUBHEAD Bree Serif Bold but also make it fourfold the underline of the date and time.

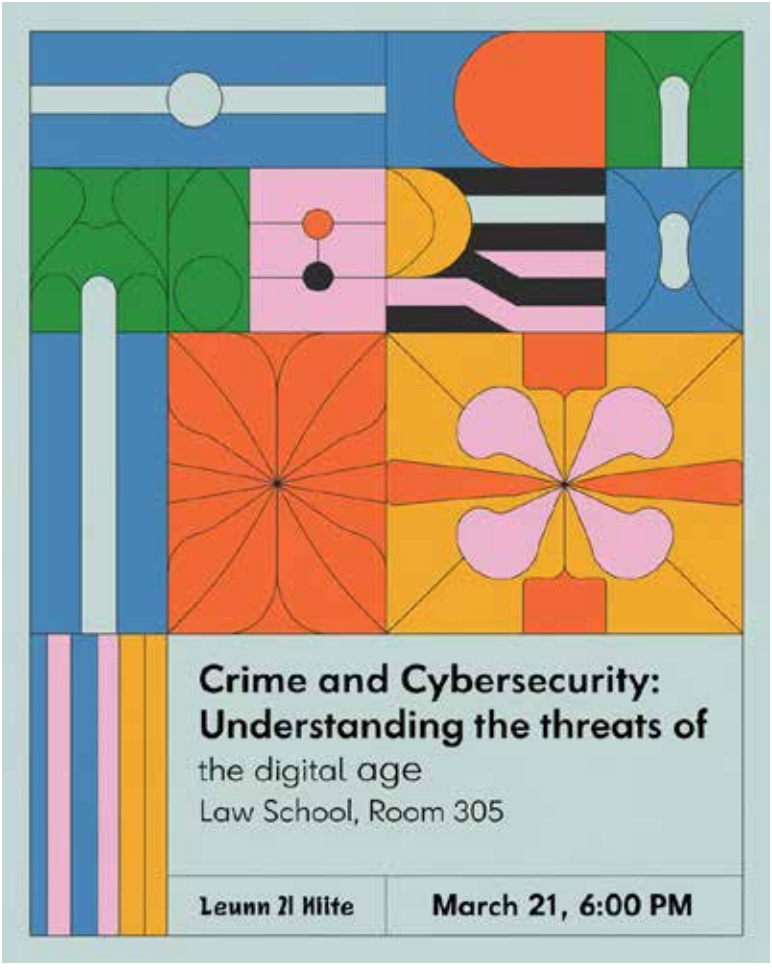
AI ORIGIN



PROMPT Something out of Expressionism in Design but Carried along with a Dual sections layout.

HEADLINE Alegreya Sans but make the modifier fourfold the slant.

SUBHEAD Bree Serif Bold but also make it fourfold the slant of the date and timer.



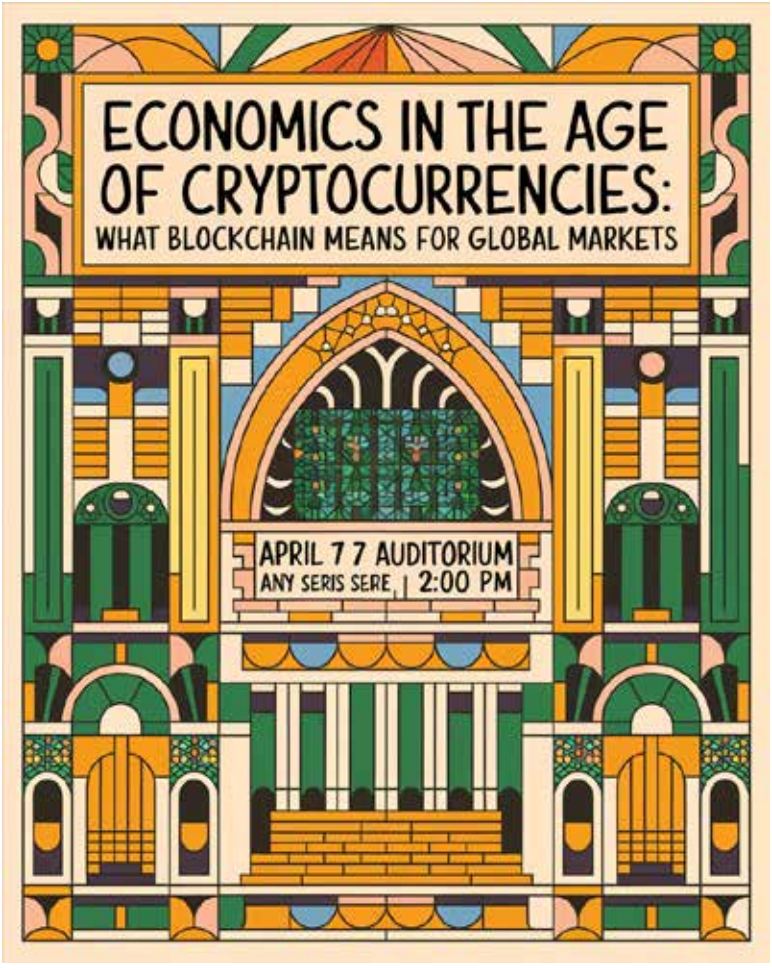
AI ORIGIN

PROMPT Something made by Piet Mondrian in Dutch Abstract Art but Licked along with a Grid with offset layout.

HEADLINE Mulish Regular but make the conjunction quintuple the width.

SUBHEAD Cormorant but also make it quintuple the width of the date

AI ORIGIN



PROMPT Something out of the Arts and Crafts Movement but Tipped along with a Horizontal stacking layout.

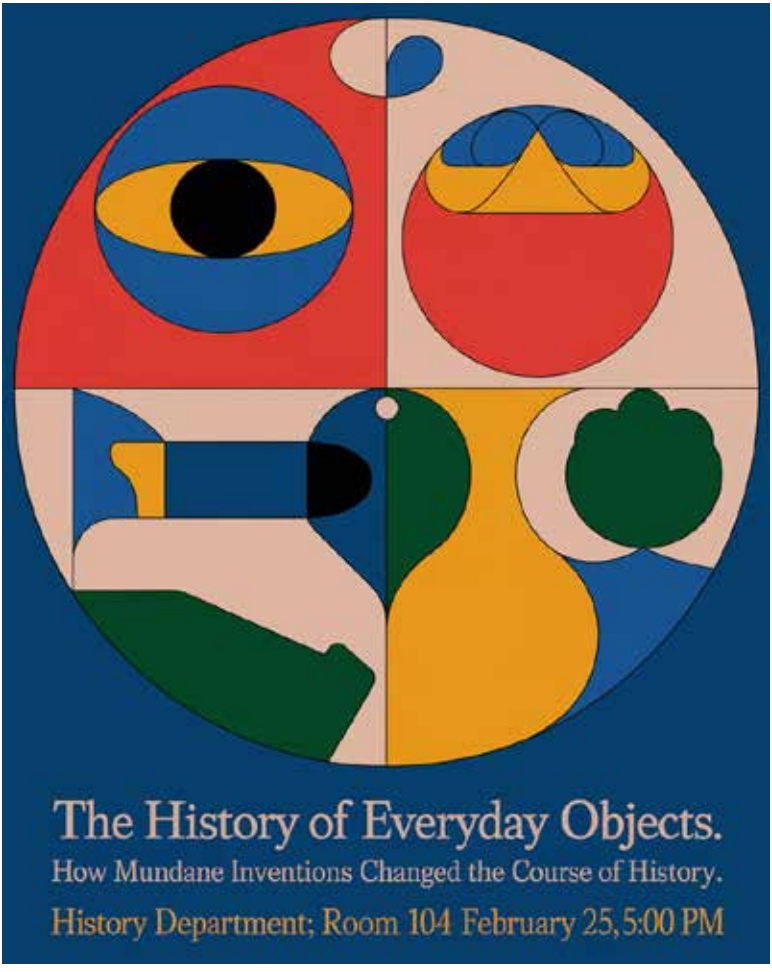
HEADLINE Bubbler One but make the adjective quadruple the size.
SUBHEAD Any Superellipse Sans Serif but also make it quadruple the slant of the venue.

PROMPT Something made by Charles Eames in Furniture but Slapped along with a Split sections layout.

HEADLINE DM Sans but make the clause one fifth the underline.

SUBHEAD Bitter but also make it one fifth the width of the date and time.

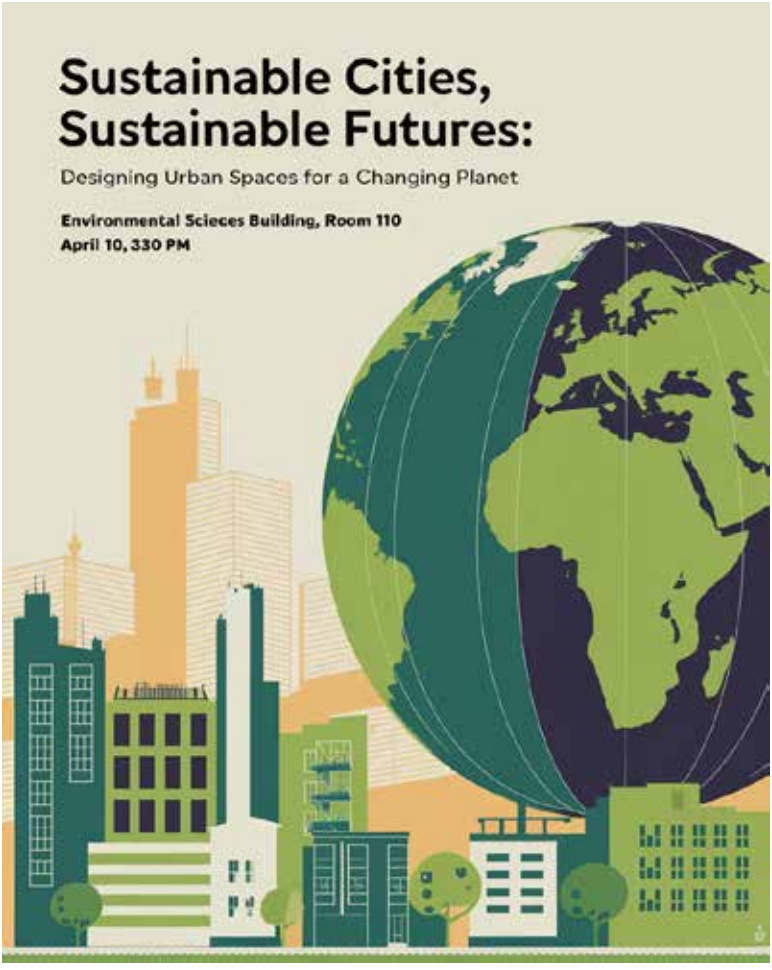
AI ORIGIN



PROMPT Something made by Arne Jacobsen in Modernist Design but Rapped along with a Circular layout.

HEADLINE Cardo Italic but make the noun one third the color.

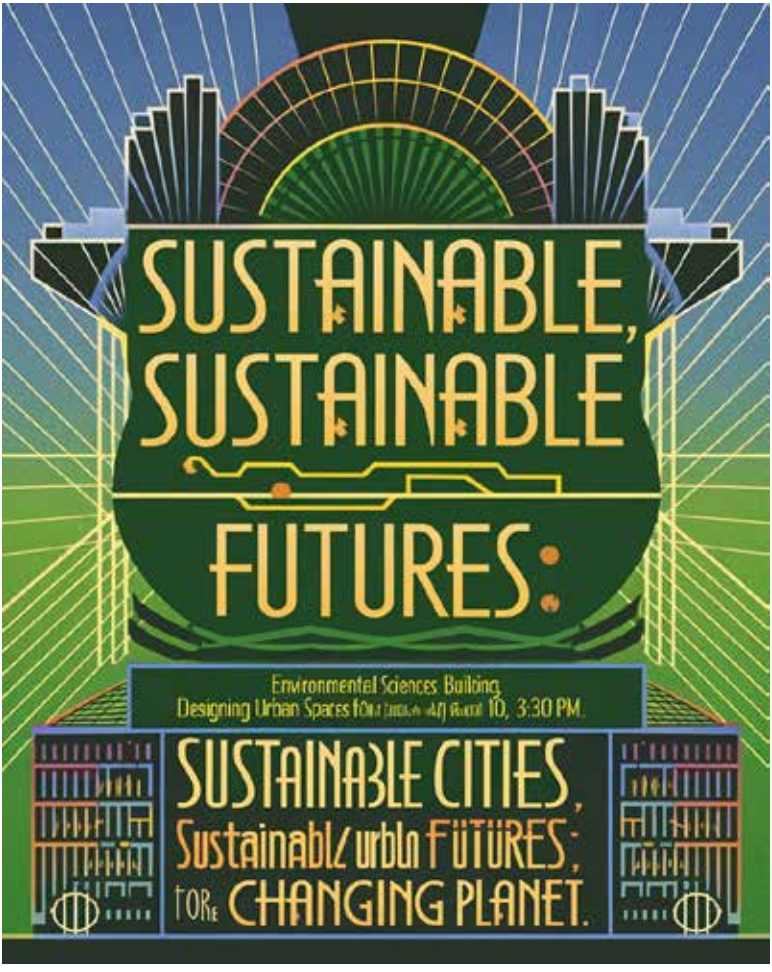
SUBHEAD Cardo but also make it one third the contrast of the date and time.



PROMPT Something like Eero Saarinen's Designs but Tugged along with a Unordered layout.

HEADLINE Viga but make the phrase triple the word spacing.
SUBHEAD Overpass but also make it triple the word spacing of the date and time.

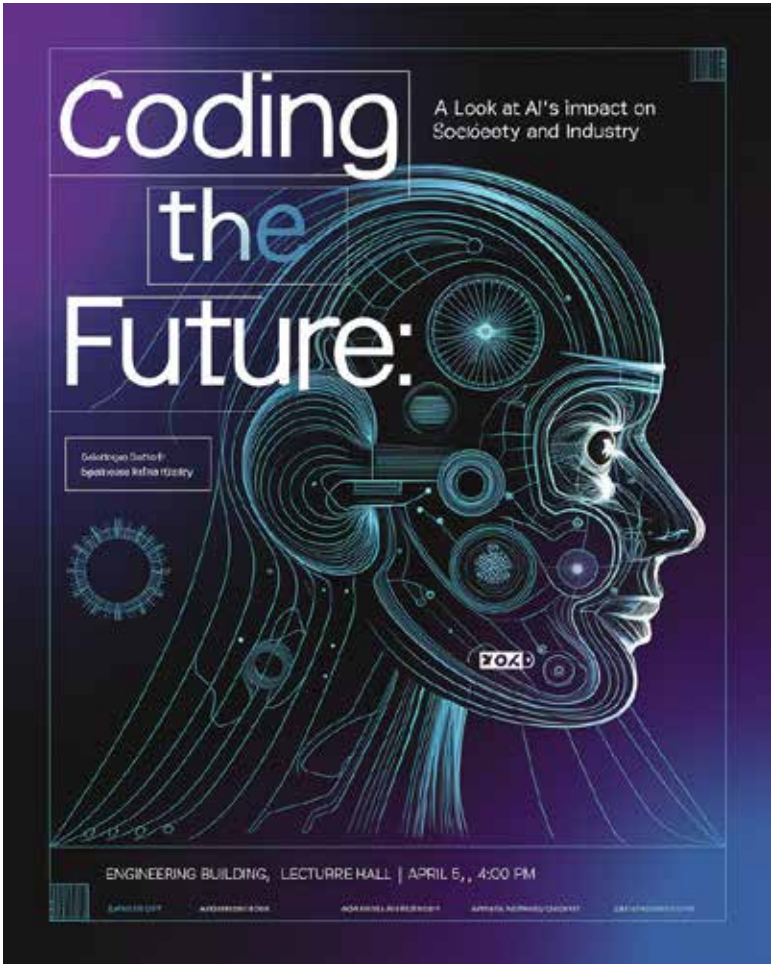
AI ORIGIN



PROMPT Something out of Art Deco but Tripped along with a Banded layout..

HEADLINE Viga but make the clause tenfold the construction.

SUBHEAD Cabin Sketch Italic but also make it tenfold the letter spacing of the venue.



PROMPT Something like Vera Wang's Fashion but Licked along with a Uneven distribution layout.

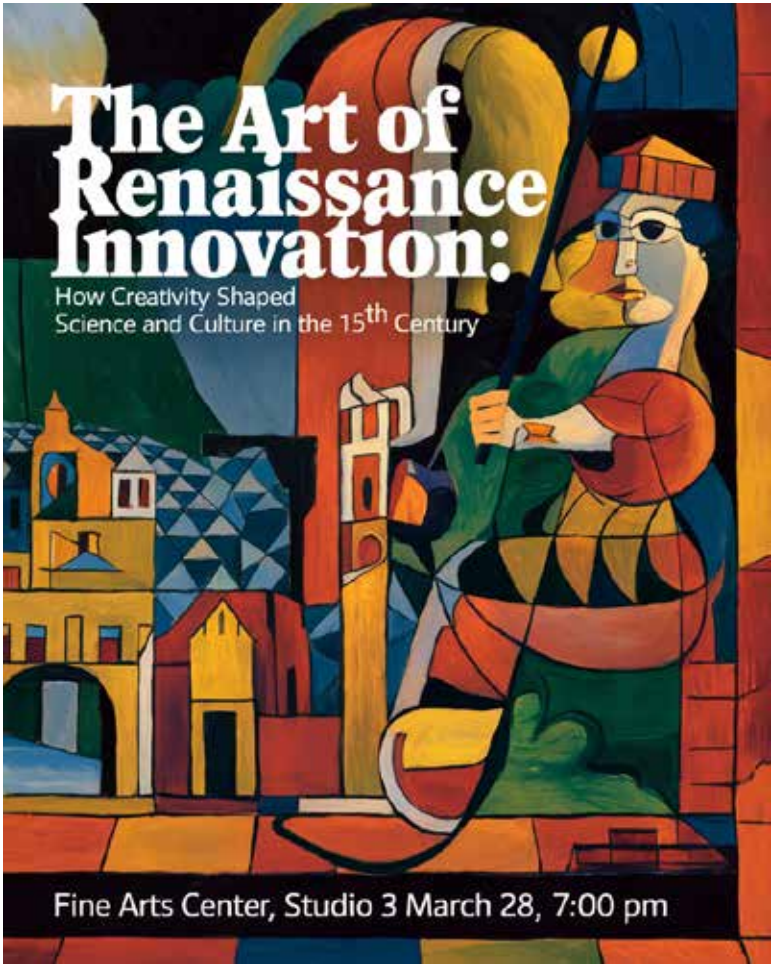
HEADLINE Teko but make the noun double the weight.

SUBHEAD Bebas Neue but also make it double the weight of the header.

AI ORIGIN

PROMPT Something made by Pablo Picasso in Abstract Expressionism but Destroyed along with a Layered layout layout.

HEADLINE Khand but make the preposition tenfold the construction.
SUBHEAD Noto Sans but also make it tenfold the construction of the date and time.



PROMPT Something made by Pablo Picasso in Abstract Expressionism but Bent along with a Centralized layout.

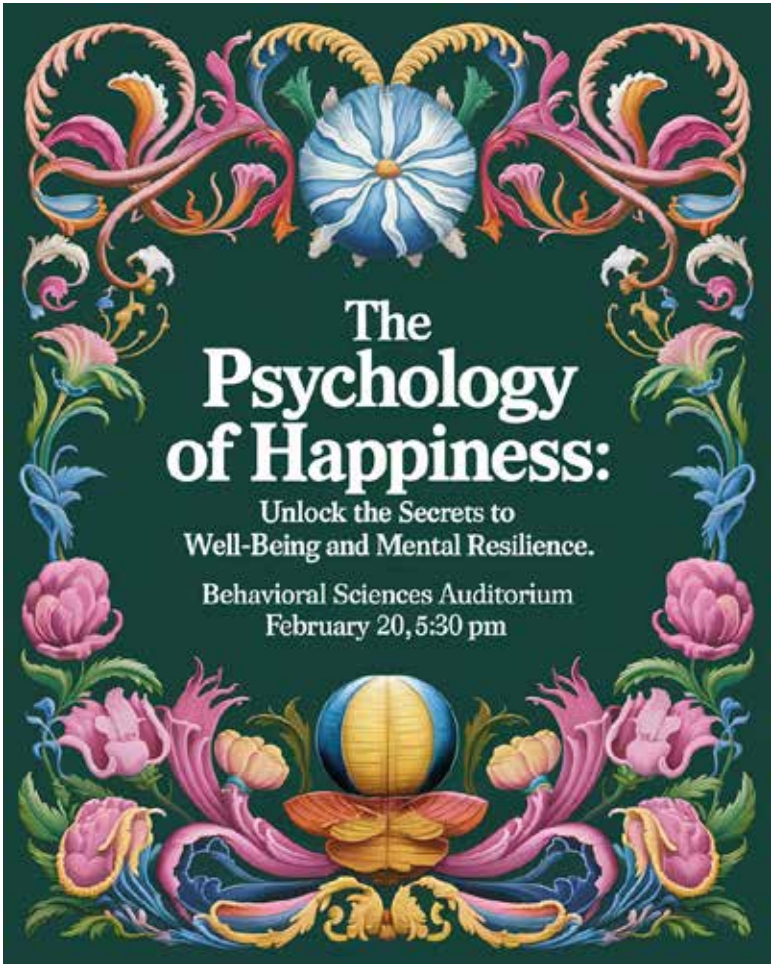
HEADLINE Inter Italic but make the noun one third the contrast.

SUBHEAD Ubuntu Mono but also make it one third the contrast of the venue.

AI ORIGIN

PROMPT Something like Robert Venturi's Postmodern Architecture but Throttled along with a Parallel layoutt.

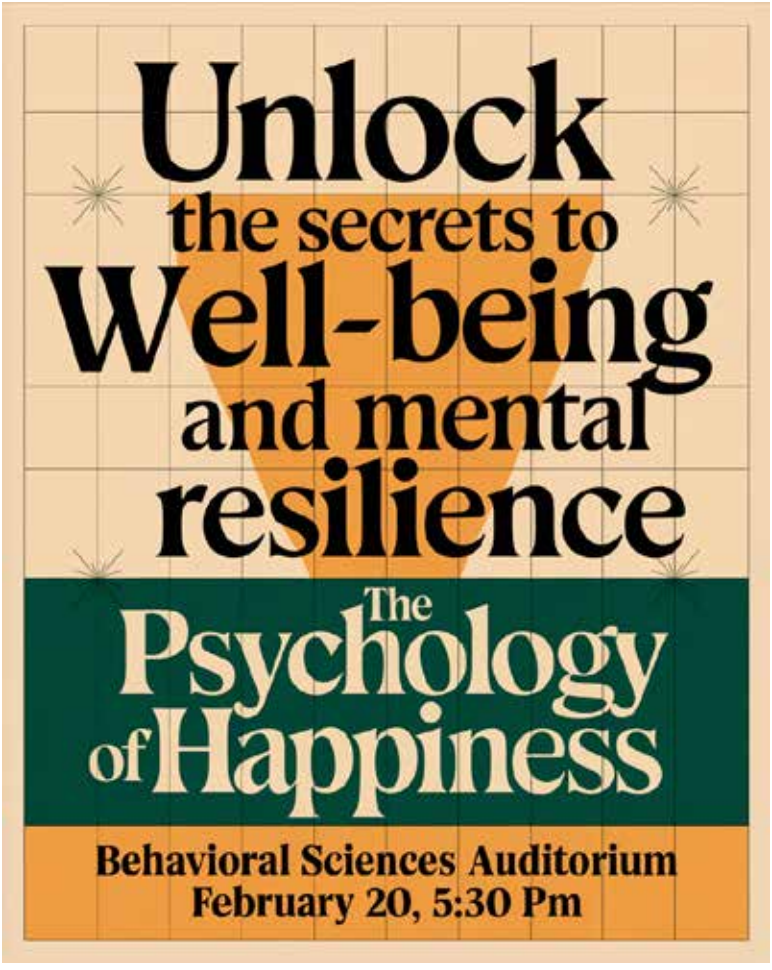
HEADLINE Rationale but make the pronoun hundredth the contrast.
SUBHEAD Fira Sans Extra Condensed but also make it hundredth the opacity of the date and time.



PROMPT Something made by Caravaggio in Baroque Art but Twisted along with a Center-aligned layout.

HEADLINE Rasa but make the conjunction one eighth the size.
SUBHEAD Any Fatface Serif but also make it one eighth the case of the date and time.

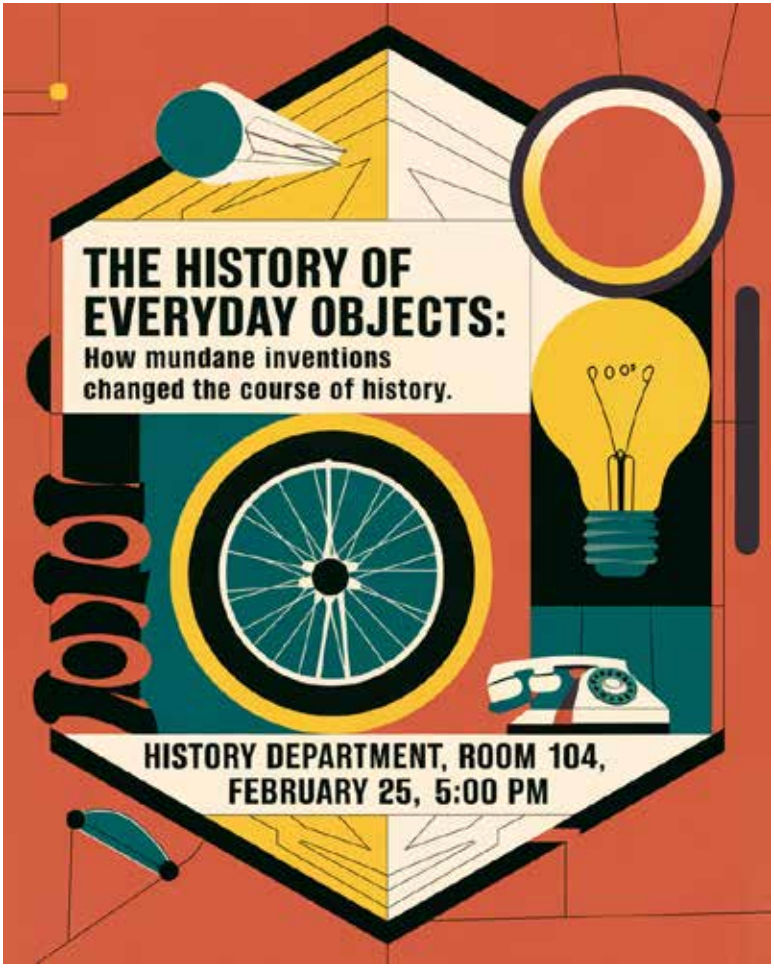
AI ORIGIN



PROMPT Something like the Aesthetic Movement Design but Swatted along with a Grid with offset layout.

HEADLINE Brawler but make the pronoun double the line height.

SUBHEAD Cabin but also make it double the alignment of the venue.



PROMPT Something out of Mid-Century Modernism but Bumped along with a Hexagonal layout.

HEADLINE Montserrat but make the adverb one fourth the word spacing.
SUBHEAD Righteous Bold but also make it one fourth the weight of the header.

AI ORIGIN

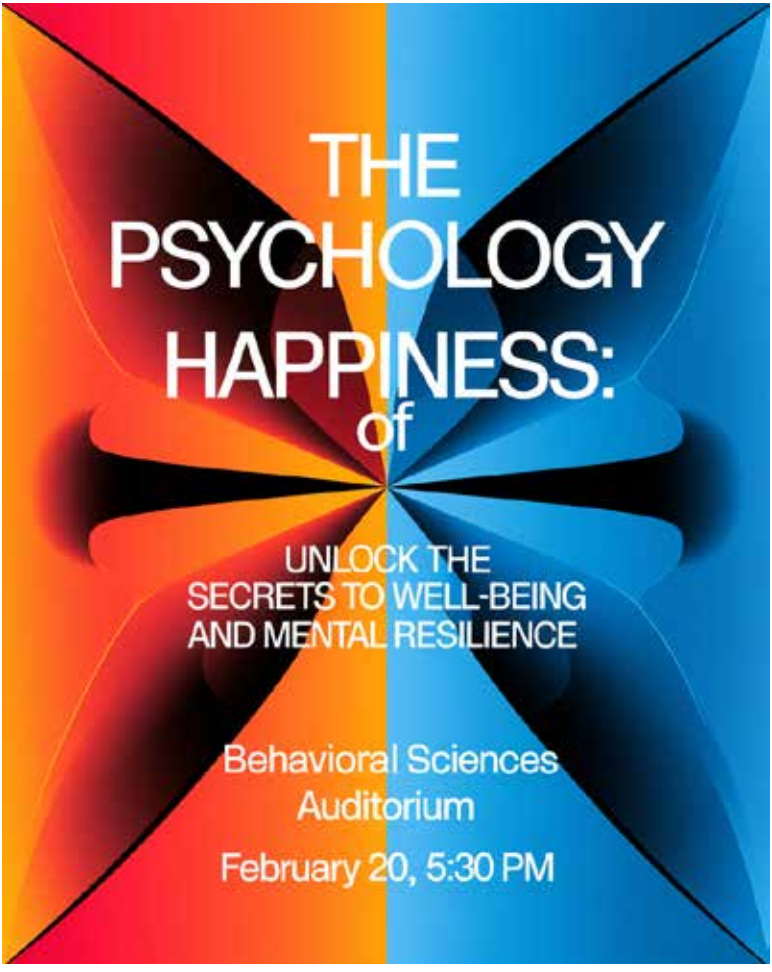
PROMPT Something like Modernist Graphics by Paul Rand but Destroyed along with a Focal point-centered layout.

HEADLINE Crimson Pro but make the subject one third the line height.
SUBHEAD Satisfy but also make it one third the width of the venue.

PROMPT Snomething out of Constructivist Art by El Lissitzky but Fragmented along with a Coiled layout.

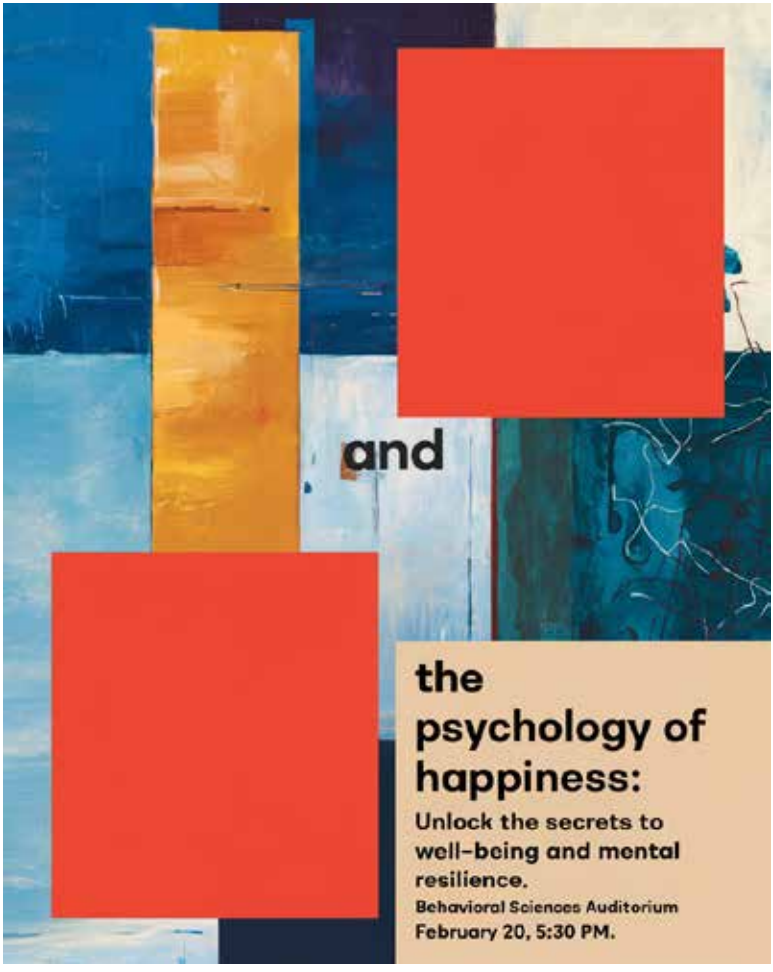
HEADLINE Signika Bold but make the clause one third the alignment.
SUBHEAD Crimson Pro but also make it one third the shadow of the date

AI ORIGIN



PROMPT Something out of the Bauhaus Movement but Snapped along with a Vertical symmetry layout.

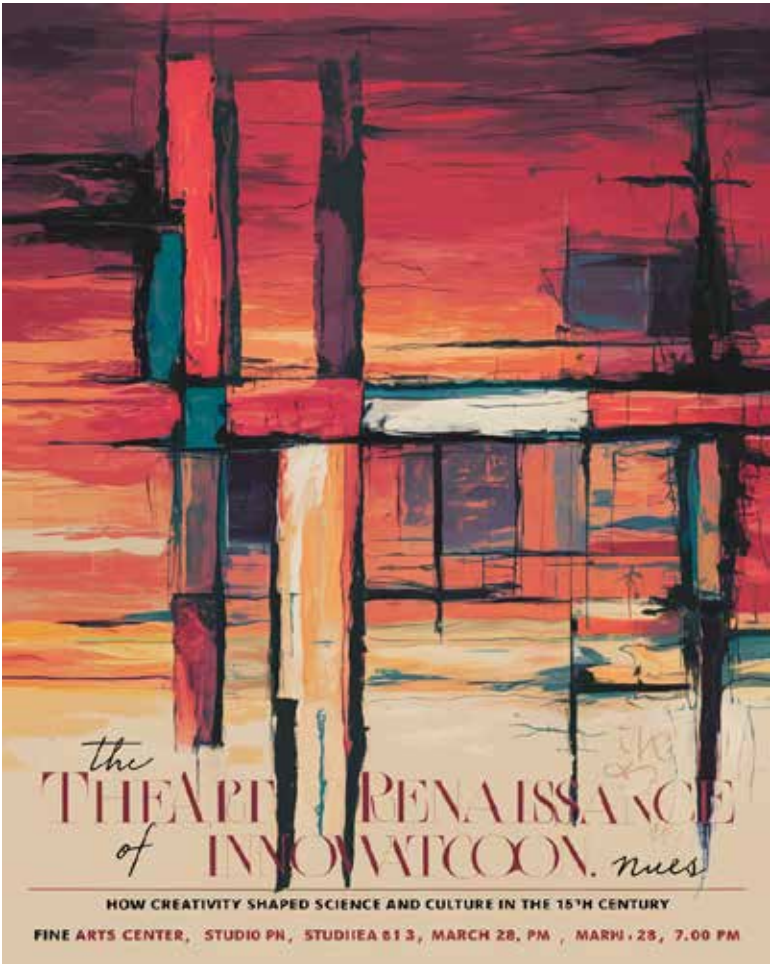
HEADLINE Spectral SC but make the modifier one eighth the alignment.
SUBHEAD Shadows Into Light but also make it one eighth the alignment of the date and time.



PROMPT Something like Abstract Expressionism by Mark Rothko but Tackled along with a Fragmented layout..

HEADLINE Pacifico Regular but make the conjunction one third the line height.
SUBHEAD Roboto Serif Italic but also make it one third the opacity of the header.

AI ORIGIN



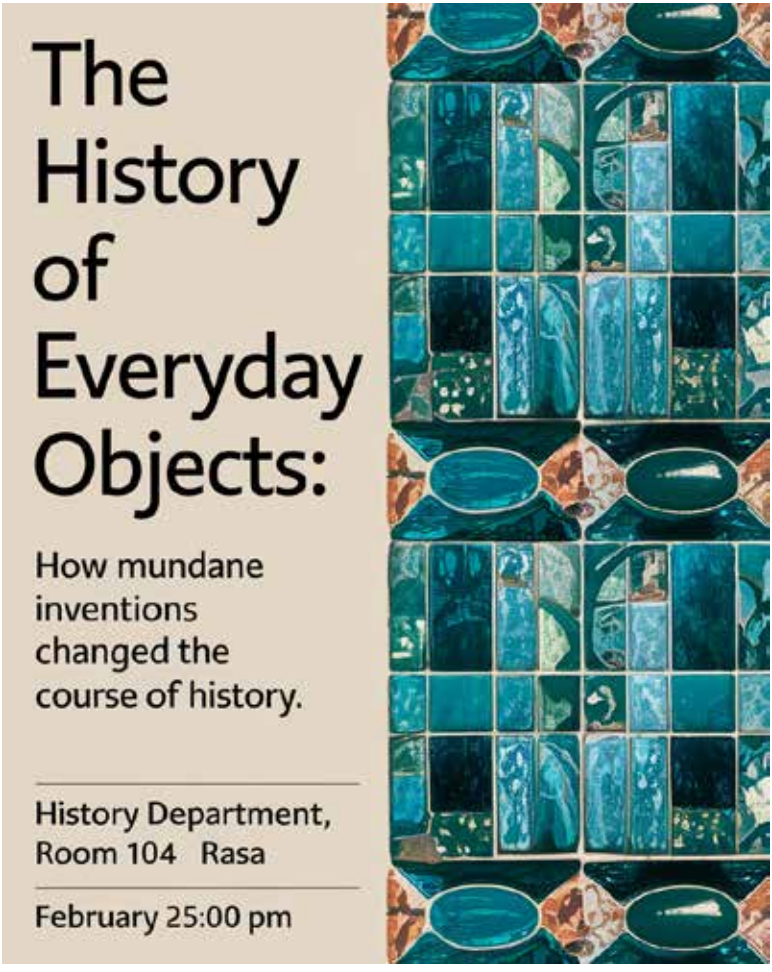
PROMPT Something like Abstract Expressionism by Mark Rothko but Tackled along with a Checker layout..

HEADLINE Source Serif Pro but make the article one tenth the word spacing.
SUBHEAD Khand but also make it one tenth the word spacing of the date and time.

PROMPT Something made by Piet Mondrian in Dutch Abstract Art but Grabbed along with a Focal point-centered layout.

HEADLINE Source Sans Pro but make the modifier one eighth the word spacing.
SUBHEAD Alegreya SC but also make it one eighth the line height of the date and time.

AI ORIGIN



PROMPT Something out of the Arts and Crafts Movement but Crushed along with a Vertical layout..

HEADLINE Bitter but make the article triple the letter spacing.

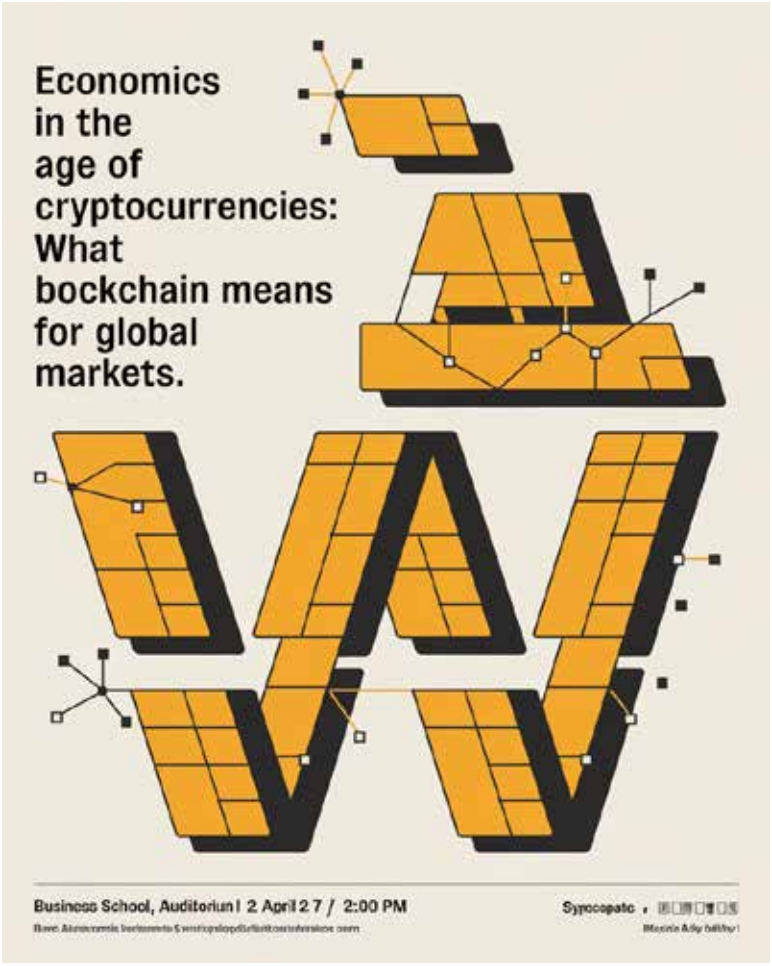
SUBHEAD Rasa but also make it triple the case of the date and time

PROMPT Unfolded along with a Unordered layout.

HEADLINE Mulish but make the clause quadruple the case.

SUBHEAD Work Sans Medium

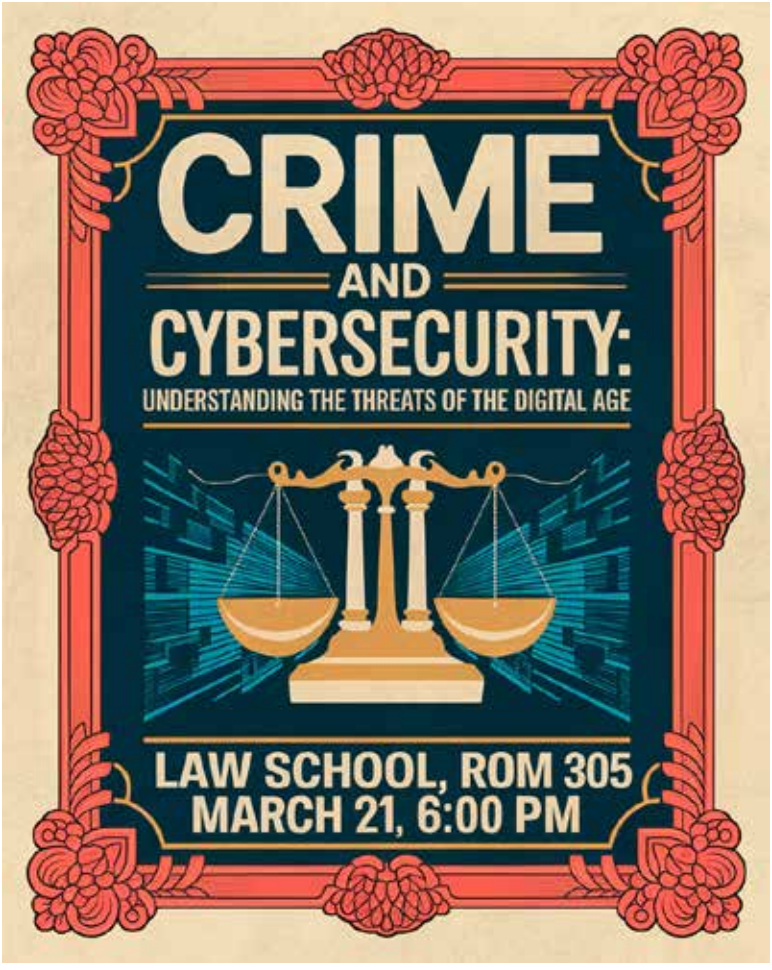
AI ORIGIN



PROMPT A W-shaped layout

HEADLINE Arvo Bold

SUBHEAD Syncopate

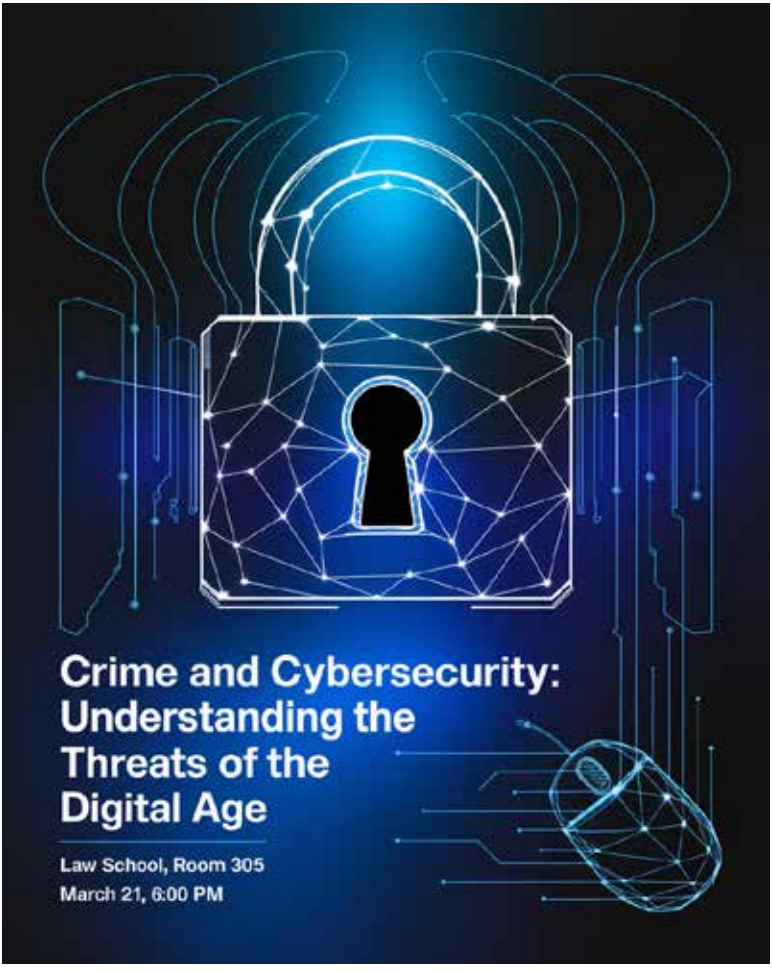


PROMPT Swatted along with a Inset framing layout.

HEADLINE Sanchez but make the modifier half the weight.

SUBHEAD Mukta SemiBold

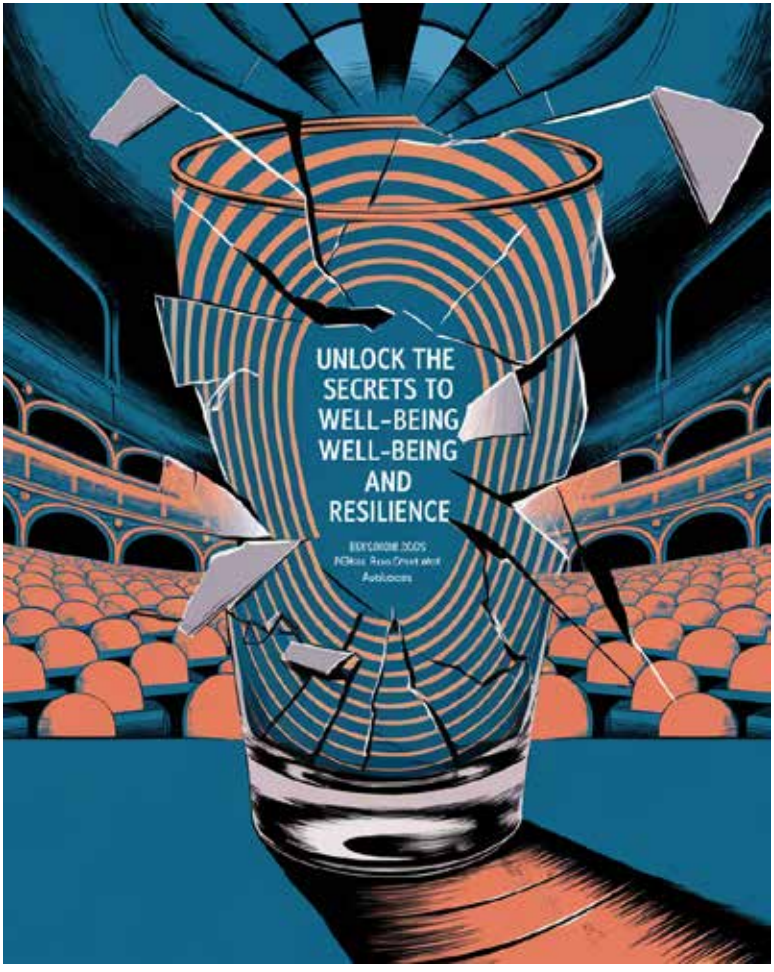
AI ORIGIN



PROMPT Swatted along with a Inset framing layout.

HEADLINE Sanchez but make the modifier half the weight.

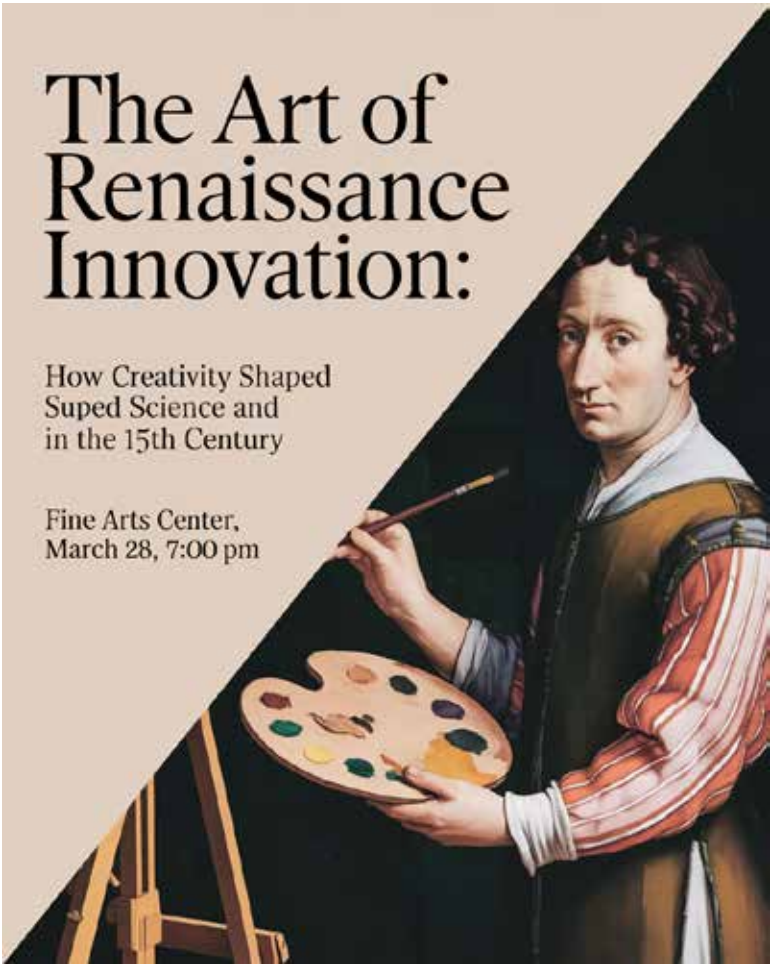
SUBHEAD Mukta SemiBold



PROMPT Something out of Post-Impressionist Designs by Van Gogh but Shattered along with a Concentric circles layout.

HEADLINE Archivo Narrow but make the first word thrice the slant.
SUBHEAD Raleway Thin but also make it thrice the color of the header.

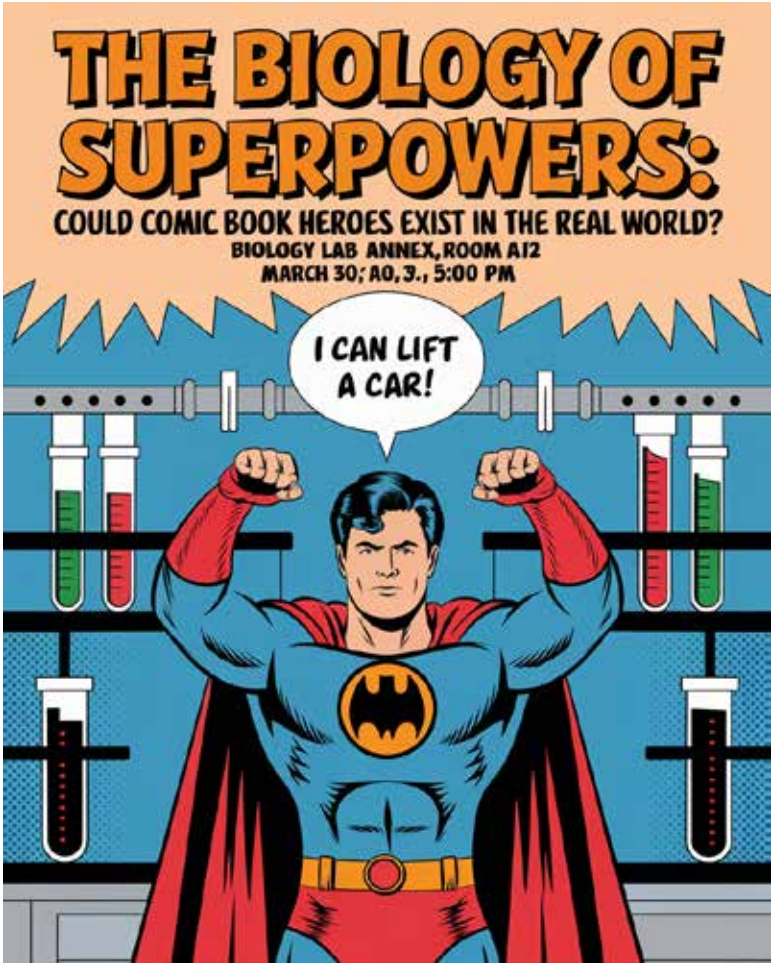
AI ORIGIN



PROMPT A Diagonal stripes layout.

HEADLINE Any Slab Serif.

SUBHEAD Lobster Two.

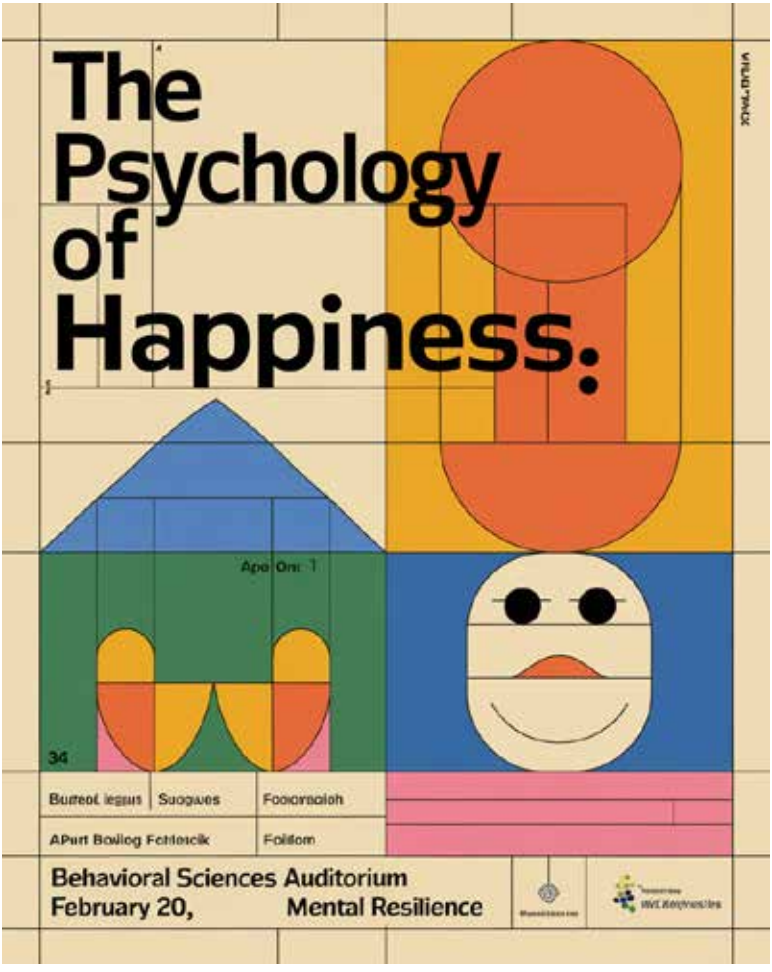


PROMPT A Symmetrical layoutt.

HEADLINE Mulish Regular

SUBHEAD Lobster Two

AI ORIGIN



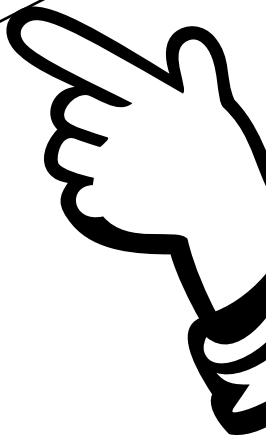
PROMPT Something made by Le Corbusier in Modernism but Flicked along with a Grid with offset layout.

HEADLINE Paytone One but make the every other letter double the weight

SUBHEAD Cairo but also make it double the underline of the date and timer.

CHAPTER 5

Conclusion



A. Results of Review–Survey

General Observations

There were several observable conclusions from the survey data. First, the survey revealed an average Likert score of 2.9 and a median Likert score of 3.0. Except for two works, all the works have skewed distributions of their ratings. A box plot visualization captures the aggregated scores for each artifact with their central tendencies. The filled box plot is a negative skew between mean and median Likert score, while a hollow box plot is a positive skew between the mean and median Likert score. The whiskers for the chart show almost all the artifacts received 1 and 5 ratings. This shows the distribution of the Likert scores is widely dispersed, with some slight skew, whether positive or negative. This means that outliers of opinion either in favor of or against an artifact determined the mean Likert score.

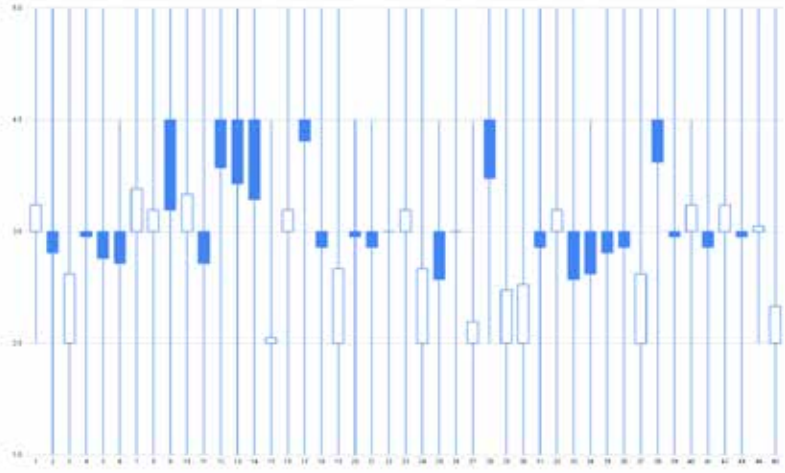
Rating of AI to Author Produced Work

AI work had both an average and median rating of 2.9 out of 5, ten works with a negative skew and ten works with a positive skew. The author received an average rating of 3.0 and a median rating of 3.2 Thirteen works had a negative skew, and six works had a positive skew.

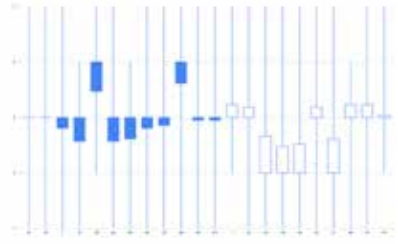
Correlations Between Variables

There is a moderate correlation (0.55) between knowing the content of a lecture and the mean visual interest score. There is a moderate correlation (0.54) between knowing the content of a lecture and knowing the location/date of the lecture.There is a weak correlation (0.29) between a design made by the author and the median visual interest score. There is a weak correlation (0.26) between knowing the content of a lecture and the average visual interest score. There is a weak correlation (0.22) between a design made by

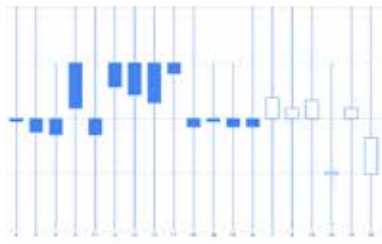
All artifacts Box Plot of Visual Interest Rating



AI-made artifacts



Author-made artifacts



the author and the mean visual interest score. There is no correlation (0.009) between a work made by AI and the average visual interest score. There is no correlation (0.009) between a work made by a human and the average visual interest score.

B. Comparison of Human & AI made posters

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	95.24%	100.00%	2.2	
AI	×	100.00%	76.19%	3.2	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	85.71%	90.48%	2.3	
AI	×	90.48%	57.14%	2.8	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	95.24%	90.48%	2.6	
AI	×	95.24%	76.19%	3.2	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	100.00%	100.00%	2.9	
AI	×	80.95%	95.24%	2.6	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	38.10%	90.48%	2.0	
AI	×	90.48%	100.00%	2.6	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	85.71%	14.29%	2.7	
AI	×	80.95%	100.00%	2.6	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	95.24%	76.19%	2.7	
AI	×	80.95%	66.67%	3.0	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	66.67%	90.48%	2.9	
AI	×	100.00%	95.24%	3.2	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	90.48%	100.00%	3.0	🏆
AI	✗	61.90%	80.95%	2.7	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	85.71%	76.19%	3.0	🏆
AI	✗	66.67%	19.05%	2.6	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	80.95%	71.43%	3.2	🏆
AI	✗	71.43%	42.86%	2.5	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	100.00%	100.00%	3.2	🏆
AI	✗	95.24%	80.95%	3.0	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	100.00%	100.00%	3.2	🏆
AI	✗	100.00%	100.00%	3.0	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	100.00%	100.00%	3.3	🏆
AI	✗	80.95%	95.24%	2.8	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	100.00%	100.00%	3.4	🏆
AI	✗	100.00%	100.00%	3.6	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	80.95%	80.95%	3.4	🏆
AI	✗	47.62%	38.10%	2.5	

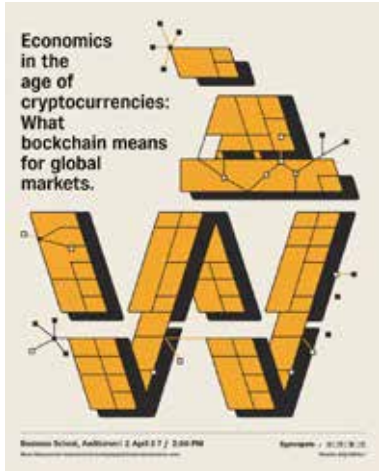
	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	95.24%	80.95%	3.6	🏆
AI	✖	71.43%	71.43%	3.2	

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	100.00%	100.00%	3.8	🏆
AI	✖	90.48%	80.95%	3.0	

The general observations from the review survey indicate a negligible difference between human- and AI-made posters, but in a particular comparison of human- and AI-made posters with the same prompt parameters, a more distinct difference is observed. The comparison between human- and AI-made posters is measured according to four criteria: First, if the design used the prescribed fonts in the prompt, followed by comparing the average ratings from the user survey. That is, the survey questions regarding understanding the content of the lecture; the date, time and location of the lecture; and visual interest rating were treated a distinct categories with equal weight. The artifact with the higher percentage or average Likert score is considered the winner of that criterion. The winner of the set is determined by winning 3 out of the 4 criteria. The comparison is considered a draw if each artifact wins 2 criteria. From the head-to-head comparisons, we find that the human-made designs won 14 times, there were 2 draws, and AI won 2 times. This means approximately that for every time AI won, human-made designs won 8 times. The head-to-head comparisons are presented above. Following this paragraph, the particular designs for each prompt are displayed with their head-to-head comparisons below the posters.

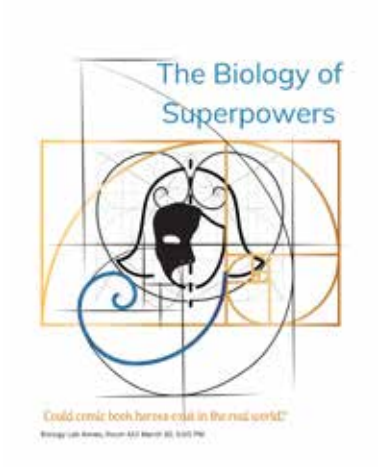
HUMAN ORIGIN

AI ORIGIN

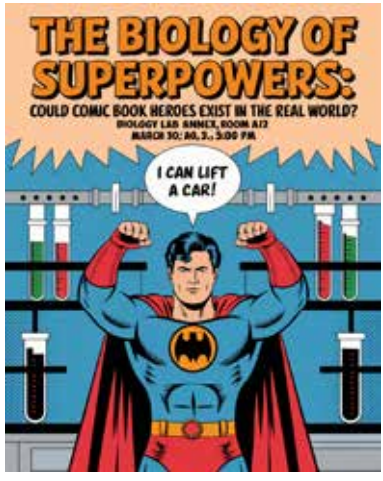


	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	95.24%	100.00%	2.2	
AI	×	100.00%	76.19%	3.2	

HUMAN ORIGIN



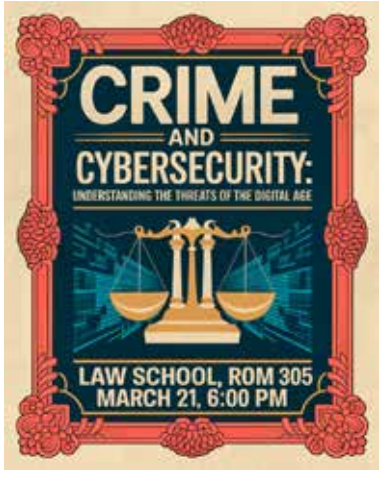
AI ORIGIN



	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	85.71%	90.48%	2.3	
AI	×	90.48%	57.14%	2.8	

HUMAN ORIGIN

AI ORIGIN



	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	95.24%	90.48%	2.6	🏆
AI	×	95.24%	76.19%	3.2	

HUMAN ORIGIN

AI ORIGIN

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	100.00%	100.00%	2.9	🏆
AI	×	80.95%	95.24%	2.6	

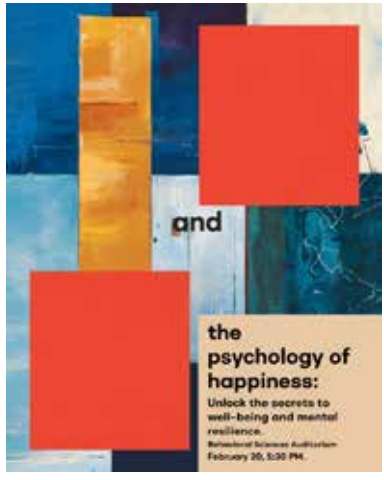
HUMAN ORIGIN

AI ORIGIN

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	38.10%	90.48%	2.0	
AI	×	90.48%	100.00%	2.6	🏆

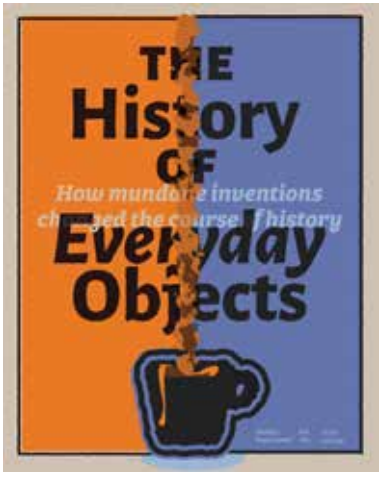
HUMAN ORIGIN

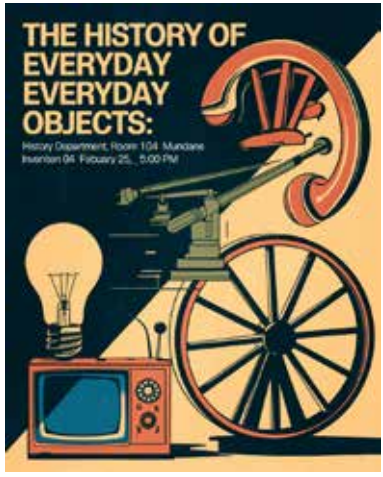
AI ORIGIN



	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	85.71%	14.29%	2.7	🏆
AI	×	80.95%	100.00%	2.6	

HUMAN ORIGIN

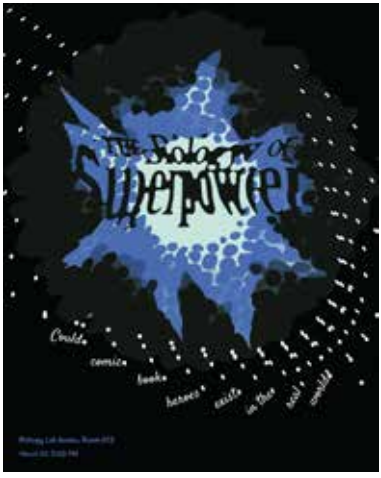




AI ORIGIN

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	95.24%	76.19%	2.7	🏆
AI	✗	80.95%	66.67%	3.0	

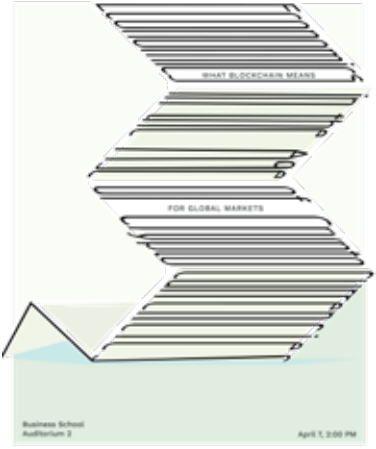
HUMAN ORIGIN



AI ORIGIN

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	66.67%	90.48%	2.9	
AI	✗	100.00%	95.24%	3.2	🏆

HUMAN ORIGIN



AI ORIGIN

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	80.95%	71.43%	3.2	🏆
AI	✗	71.43%	42.86%	2.5	

HUMAN ORIGIN

AI ORIGIN

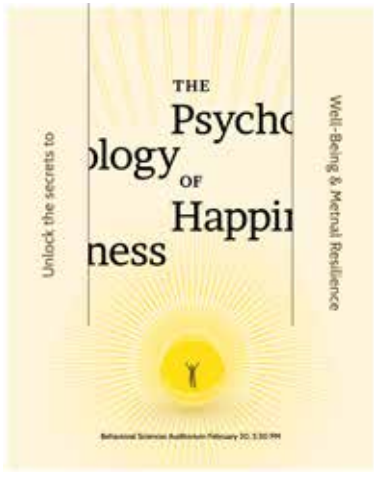
	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	100.00%	100.00%	3.2	🏆
AI	✗	95.24%	80.95%	3.0	

HUMAN ORIGIN

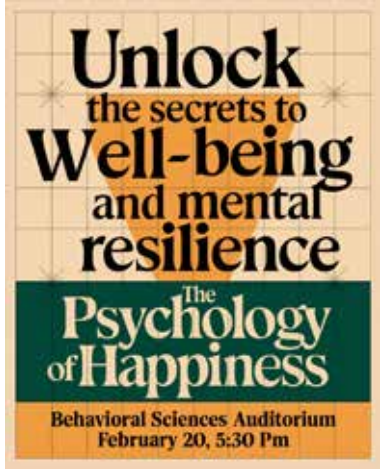
AI ORIGIN

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	90.48%	100.00%	3.0	🏆
AI	✗	61.90%	80.95%	2.7	

HUMAN ORIGIN

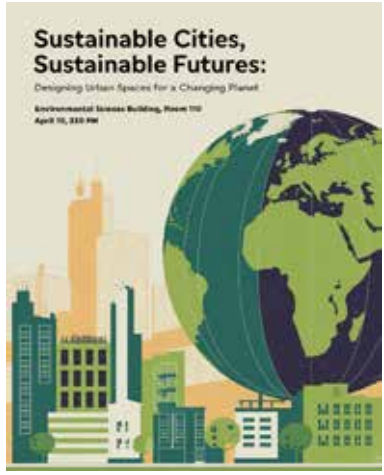


AI ORIGIN



	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	85.71%	76.19%	3.0	🏆
AI	✗	66.67%	19.05%	2.6	

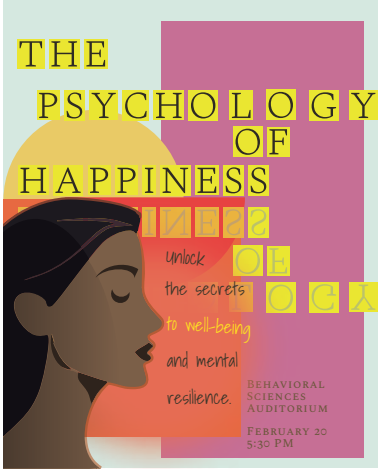
HUMAN ORIGIN

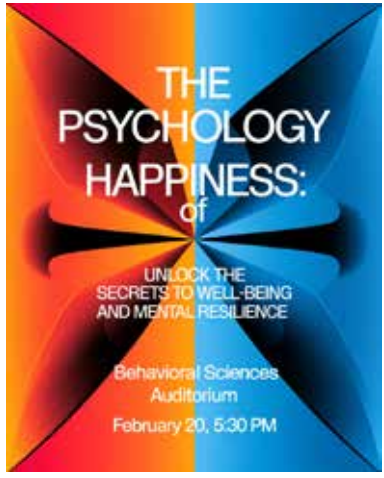


AI ORIGIN

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	80.95%	71.43%	3.2	🏆
AI	✗	71.43%	42.86%	2.5	

HUMAN ORIGIN



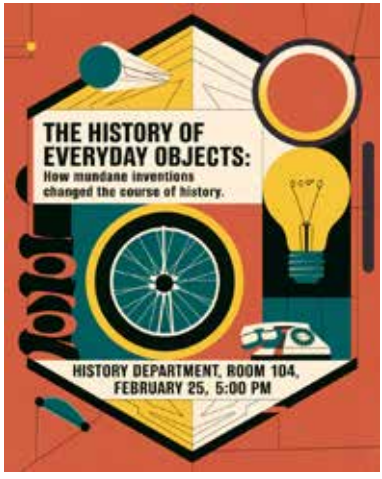


AI ORIGIN

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	100.00%	100.00%	3.2	🏆
AI	✗	95.24%	80.95%	3.0	

HUMAN ORIGIN

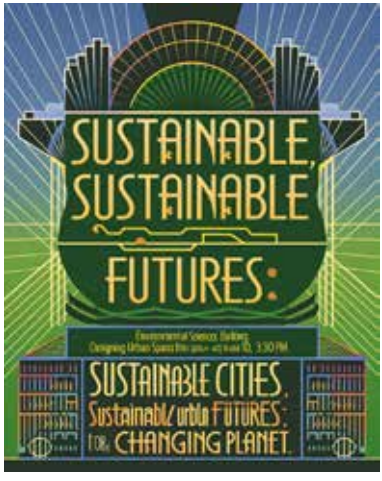
AI ORIGIN



	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	100.00%	100.00%	3.4	🏆
AI	✗	100.00%	100.00%	3.6	

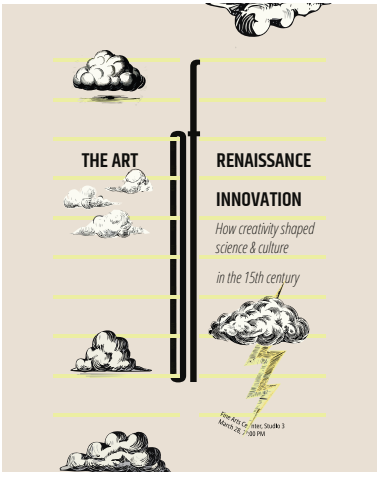
HUMAN ORIGIN

AI ORIGIN



	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	80.95%	80.95%	3.4	🏆
AI	✗	47.62%	38.10%	2.5	

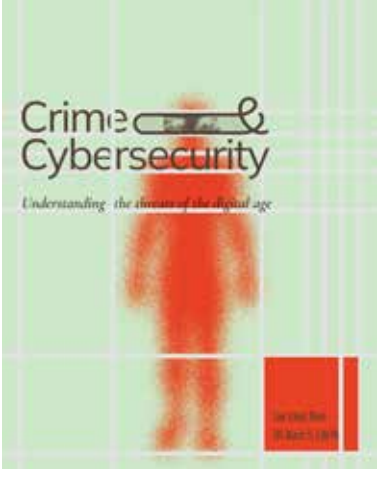
HUMAN ORIGIN

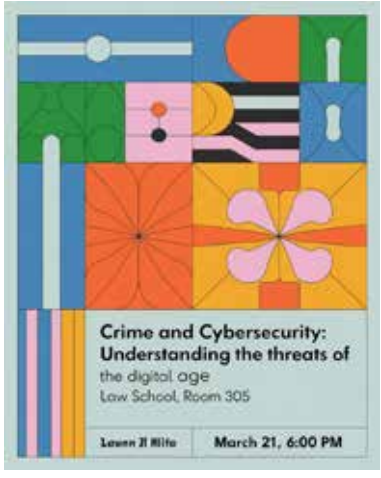


AI ORIGIN

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	95.24%	80.95%	3.6	🏆
AI	✗	71.43%	71.43%	3.2	

HUMAN ORIGIN





AI ORIGIN

	Used Fonts	Knows Content	Knows Location	Rating	Winner
Human	✓	100.00%	100.00%	3.8	🏆
AI	✗	90.48%	80.95%	3.0	

c. Closing Remarks

The creative use and pairing of fonts is an important aspect of successful visual communication. With the development of low-cost LLMs and text-to-image models, the continued utility of human-made design may require considerations about creativity. Font Flow explores how randomness might be harnessed to increase the likelihood of creative font usage in response to encroaching automation. The results were mixed; the Font Flow user interface and website were successful at creating surprise in user interaction when comparing human- and AI-made work. While the author subjectively experienced increased awareness, insight, and creativity in font usage, objective measurements of design effectiveness and visual interest as evaluated by anonymous review found that work produced by the author was only 0.1 above the sample mean and 0.2 above the sample median in visual interest. The moderate correlation of content knowledge with visual interest is enough to derive a principle of visual communication: visual expression is connected to conceptual expression, and cannot be disconnected in an "art for art's sake" sense. The Ideogram API for text-to-image generation of design posters is able to produce output slightly below mean (2.9), with some outliers surprisingly good. However, in direct head-to-head comparison to human-made designs, AI will currently win only 1 out of 8 times. Also, the Ideogram API is not currently able to understand explicit specifications of font, typeface, or the particular anatomical subdivisions of Latin typography. As LLM models improve, this limitation of the Ideogram 2.0 model will likely be corrected, thereby bringing the head-to-head comparison between human and AI-made design work closer together as the population comparison currently stands.

From these observations, I would consider several refinements of the prompt architecture to increase human performance. For example, in light of the moderate correlation of intelligible visuals to the content of the poster,

adjusting the prompt architecture to include semiotic signifiers of the lecture content as a parameter could increase visual interest. Also, improving the quality of the fonts available to design with in the prompt could also increase visual interest ratings. The reason for this hypothesis is the Ideogram limitation of font matching together with the better quality of proprietary fonts compared to open-source fonts. Also, there were no selection criteria or weighting of font quality of the open-source fonts from Google Fonts. Adding a font voting function to the Font Flow website could aggregate a weighted list of higher-quality fonts for users to work with in their design sprints.

Due to time constraints on the thesis, I was not able to conduct user testing of the design sprint experience. Conducting user interviews for the design sprint experience could provide additional insight to improve human performance. Regarding the survey sample, bias is possible due to the persons contacted were persons I knew within my social network; such a sample will not be representative to the general population. In addition, adding a user account function and database would allow for further iterative process for the user after the initial design sprint process. Also, adding functions in the Gallery section of the website such as rating the visual interest of designs in the gallery and the percentage of mis-mach between design maker origin and anticipated design marker origin. Such functions would engender more educational insight for users together with foster more social relationships of designers in a community of practice.

In a manner similar to Nina Stössinger's experience with TypeCooker, the habitual use of Font Flow is intended to spark typographic curiosity across a broader range of fonts and support the cultivation of a unique human voice in the design student user. The generation of AI renditions from the same prompts reveals an objective threshold—one that allows the design pupil to begin discerning the hidden principles behind typographic creativity.

Font Flow, through its integration of AI text-to-image models for convergent inquiry and its pairing with time-constrained human exploration, suggests a novel design process—one that preserves and amplifies human-origin design outcomes while leveraging the accelerating capabilities of AI generative models. A deeper immediacy of craft and detail lies at the heart of what it means to be human, even as technology advances to take on activities once reserved for thought.