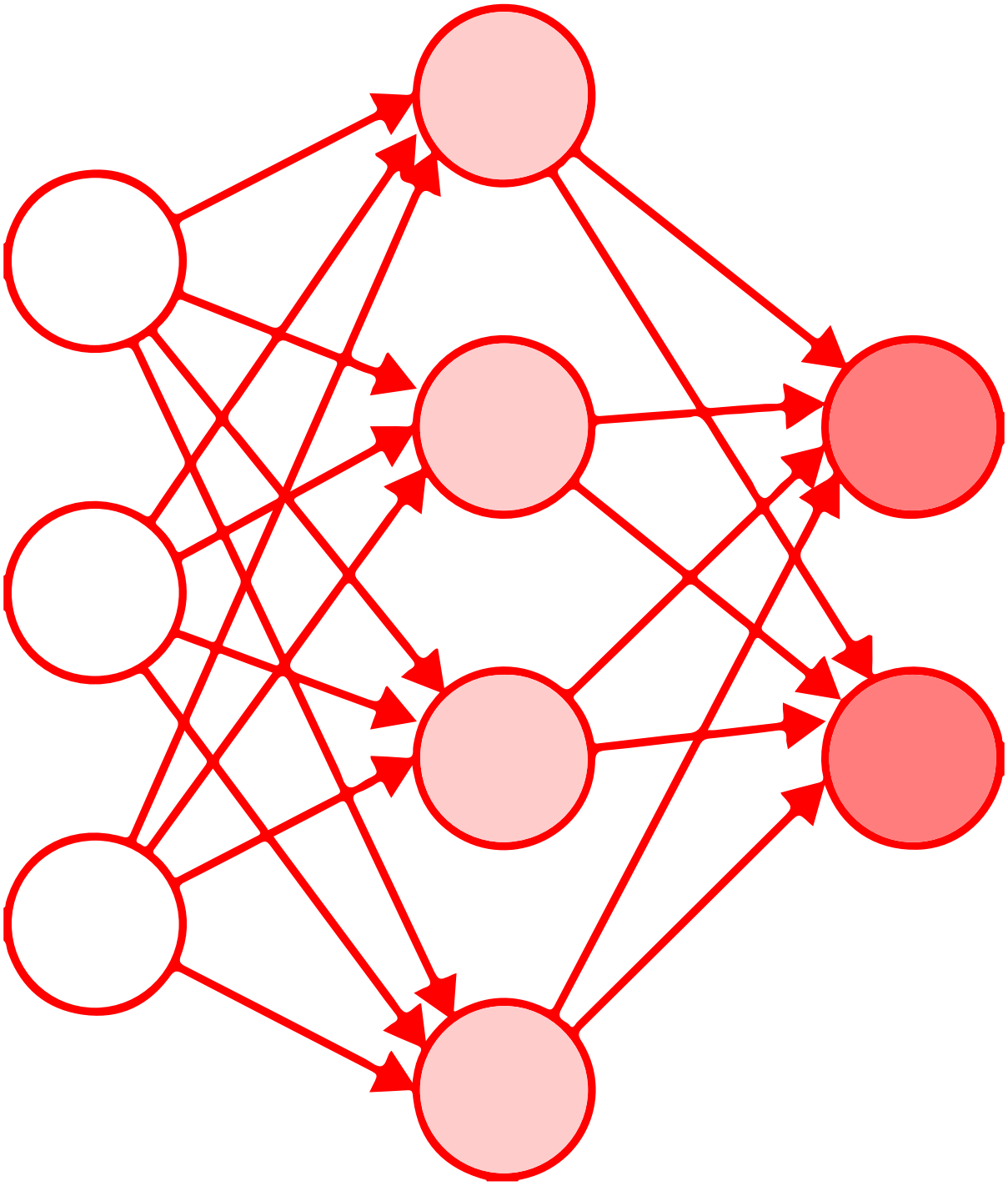
Design and Automation



Critical and Contextual Studies Digest

Design and Automation

Critical and Contextual Studies Digest
edited by Martin Lezhenin
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British Higher School of Art & Design, 2018

Introduction

We live in times where science fiction authors are struggling to keep up with reality. In recent years, there has been an explosion of research and experiments that deal with creativity and A.I. Almost every week, there is a new bot that paints, writes stories, composes music, designs objects or builds houses.

However, even though the implementation of the smart algorithms is a fact rather than a fantasy, there is still a lot of controversial thoughts and fears within the practitioners of all jobs, and graphic designers are no exception. In this digest I tried to incorporate as many thoughts as possible, giving you a fresh cut-through the industry, with both positive and negative thoughts on how this new technology can change both our design and our lives.

Martin Lezhenin

#1 What is the role of a designer in an increasingly automated society in which technological developments such as machine learning and artificial intelligence will alleviate us of many our daily routines and processes?

#2 Which of 'our' (human) skills will become obsolete or might be re-appropriated to serve as new tools which will help us operate in our ever-changing design practice?

#3 How do you create design that empowers people and seeks to oppose forces of standardization?

#4 How can design facilitate a more pluralistic perspective instead of a standardized and deterministic influences common to technology?

#5 Where do you position yourself (as a future designer) between 'man' on one end and 'machine' on the other?

#6 If 'everything' can be automated/generated, what will become your responsibility as a designer?

#7 What is the role of the designer when everyone has access to the same tools and there is no fixed canon?

#8 If technology replaces everyday face to face interaction, what are the consequences, implications and/or potential?

Core Questions, Design Academy Eindhoven – Man and Media / Man and Communication: class Man & Machine; 2017 class by The Rodina

Hey, so you're a monk. It's about 1440AD and you're just chilling out in your quarters, listening to a bit of chanting through the stone walls, practicing your black-letter while you digest your dinner. You've got a killer commission coming up to add some nice rubrics to a popular manuscript—The Bible—and you don't want to fuck it up. Suddenly your pal Hildegard is bashing down your door shouting about some guy called Gutenberg: "We're fucked dude," he's yelling, "that witch is gonna make us all redundant with his printing press. I'm off to become a coroner, people are always dying." Buzz killer.

Fast forward 600 years, and the graphic designer is that stressed-out monk, and this time Gutenberg's witchcraft is taking the form of algorithms.

Peart, R. (2016). Automation Threatens to Make Graphic Designers Obsolete. [online] Eye on Design. Available at: https://eyeondesign.aiga.org/automation-threatens-to-make-graphic-designers-obsolete/ [Accessed 15 Dec. 2018].

‘Design right now, as it’s been put on the earth — whether it’s buildings or cars or hardware — is pretty much the first thing that worked, as opposed to the best one that could be found.’

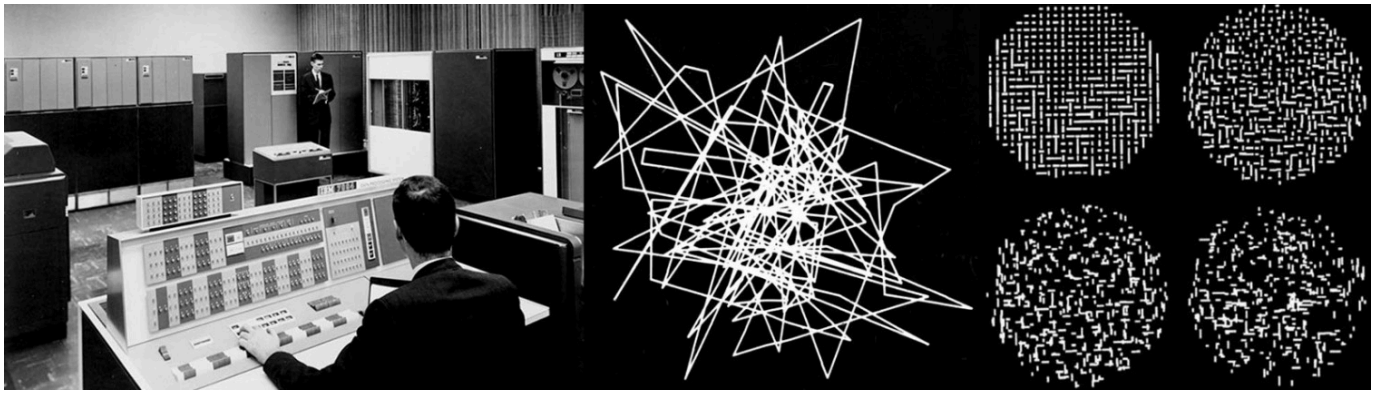
Bass, C. (2014). 3D Printing & Design - The Future of How Things are Made. [online] YouTube. Available at: https://www.youtube.com/watch?v=eAfVF1ne_1M [Accessed 15 Dec. 2018].

Until recently, the term Graphic Designer was used to describe artists firmly rooted in the fine arts. Aspiring design students graduated with MFA degrees, and their curriculums were based on traditions taught by painting, sculpture and architecture. Paul Rand once famously said: «It's important to use your hands. This is what distinguishes you from a cow or a computer operator». At best, this teaches the designer not to be dictated by their given tool. At worst, the designer is institutionalized to think of themselves as ideators: the direct opposite to a technical person.

This has obviously changed with the advent of computers (and the field of web design in particular), but not to the degree that one would expect. Despite recent efforts in defining digital-first design vocabularies, like Google's Material Design, the legacy of the printed page is still omnipresent. Even the most adept companies are organized around principles inherited from desktop publishing, and, when the lines are drawn, we still have separate design and engineering departments. Products start as static layouts in the former and become dynamic implementations in the latter. Designers use tools modeled after manual processes that came way before the computer while engineers work in purely text-based environments. I believe this approach to design will change in a fundamental way and, like Donald Knuth, I'll call this the transition from design to meta-design.

So what is meta-design? In a traditional design practice, the designer works directly on a design product. Be it a logo, website, or a set of posters, the designer is the instrument to produce the final artifact. A meta-designer works to distill this instrumentation into a design system, often written in software, that can create the final artifact. Instead of drawing it manually, she is programming the system to draw it. These systems can then be used within different contexts to generate a range of design products without much effort.

Madsen, R. (2015). On meta-design and algorithmic design systems. [online] Runemadsen.com. Available at: https://runemadsen.com/blog/on-meta-design-and-algorithmic-design-systems/ [Accessed 15 Dec. 2018].



IBM 7094 with IBM 7151 Console (1962) / Creative use of Computer Graphics by A. Michael Noll at Bell Labs (1962).

Engelbart did not only provide a vision of interacting with a computer system but he had a guiding philosophy. He believed that computers can be used to create an extension for the ways we do thinking, representation and association in our minds. Engelbart's vision was not just to automate processes but to multiply the power of people and collaborators by creating systems that augment our intellect, humanity and creativity. His goal was to raise the human potential.

Pieters, R. and Winiger, S. (2016). Creative AI: On the Democratisation & Escalation of Creativity. [online] Medium. Available at: https://medium.com/@creativeai/creativeai-9d4b2346faf3 [Accessed 15 Dec. 2018].

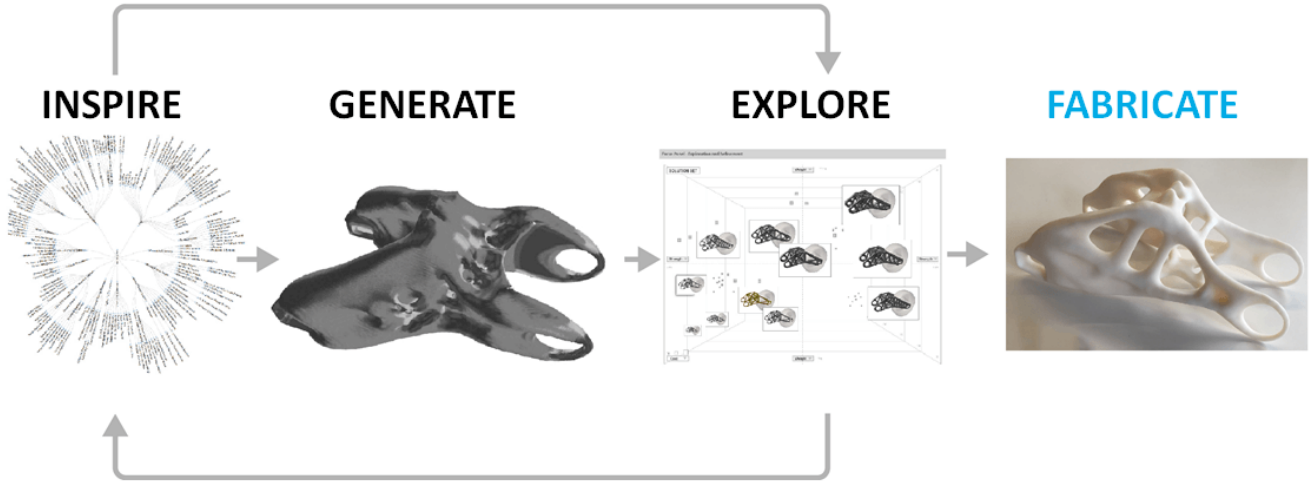
‘writing machine [that] would permit you to use a new process of composing text (..) You can integrate your new ideas more easily, and thus harness your creativity more continuously (..) This will probably allow you to devise and use even-more complex procedures to better harness your talents...’

Engelbart, D. (1962). Augmenting Human Intellect: A Conceptual Framework. [online] Dougengelbart.org. Available at: http://dougengelbart.org/content/view/138/000/ [Accessed 15 Dec. 2018].

Automation as a facet of the operational structures of the global economy produces its own unique aesthetics, which can be used as an evocative object with which to analyze and critique automation as a generality. In fact, the present essay was entirely precipitated by a revelation that the aesthetics of automation are a key signifier of the motives behind the proliferation of automated technology. Using a semiotic approach similar to that of Nietzsche, it became evident that the aesthetics of automation are not merely a cause of the amount people work today, but are also an effect of an underlying interplay of forces and powers, including the painful state of rapidly increasing amounts of work that catalyzed the need for automated technologies in the first place. These aesthetics, in fact, are a semiotic representation of, and vessel for the execution of, a new type of power being exerted over populations in an ultimate, even if unconscious, effort to make humans harder working, more docile, and more replaceable.

At base, the aesthetics of automation are constituted by the removal of the human touch or the visibly human aesthetic gesture from interfaces and interactions in both physical and digital products and services. From a design standpoint, this includes “neutral” or “objective,” hyper-rational, aesthetic choices like geometric sans-serif typefaces, machined metal, pristinely white and minimalist interfaces; falsely humanized illustrations to give these anti-human aesthetics a kind of human touch; I could go on and on.

Halladay, D. (2018). The Aesthetics of Soft Automation — Infinite Caesura. [online] Infinite Caesura. Available at: https://infinitecaesura.com/entries/aesthetics-of-automation/#3-the-aesthetics-of-automation [Accessed 15 Dec. 2018].



Autodesk Project “Dreamcatcher” (2015)

Throughout history, at the onset of every new era of technology, there have been plenty who have speculated and worried about imminent human redundancy. However, analysis by economists has shown that what actually transpires is the creation of entirely new kinds of occupations and millions of new jobs. Economists have dubbed this anxiety, “the Luddite fallacy,” after the failed Luddite rebellion in 19th-century England, where artisans, afraid of losing their jobs, vandalized power looms.

But many technologists speculate that this time with AI it’s different. Previous technological revolutions were largely confined to the mechanization of manual tasks. In comparison, AI has started to displace not only physical labor but an increasingly wide range of cognitive tasks, which, until now had remained exclusively in the human domain. Current AI systems are becoming capable not just of conducting relatively low-skilled manual jobs, such as driving or moving inventory in warehouses, but are also encroaching on cognitive jobs, such as trading in financial markets, assessing the probability of winning legal cases, automatic journalism, and doing medical diagnostic work better than humans.

Some argue that the effects of automation are already visible and present in economic data since the turn of the millennium. Yet, it’s hard to prove definitively if human technological displacement is already occurring. The clearest test case for this new era will be self-driving cars, which will likely be adopted over the next few years. If large, centrally managed, low-cost fleets of intelligent electric taxis become quickly available, it won’t be long before people start questioning the need for car ownership. This will not only displace millions of professional driving jobs, but also jobs in the surrounding support industries —from auto-body and maintenance services to car dealerships, gas stations, insurance companies, and so on.

Girling, R. (2016). AI and the future of design: Will machines take your job?. [online] O’Reilly Media. Available at: https://www.oreilly.com/ideas/ai-and-the-future-of-design-will-machines-take-your-job [Accessed 15 Dec. 2018].

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‘Human-centered design has expanded from the design of objects (industrial design) to the design of experiences (adding interaction design, visual design, and the design of spaces) and the next step will be the design of system behavior: the design of the algorithms that determine the behavior of automated or intelligent systems’.

Brownlee, J. (2016). 5 Design Jobs That Won’t Exist In The Future. [online] Fast Company. Available at: https://www.fastcompany.com/3063318/5-design-jobs-that-wont-exist-in-the-future [Accessed 15 Dec. 2018].

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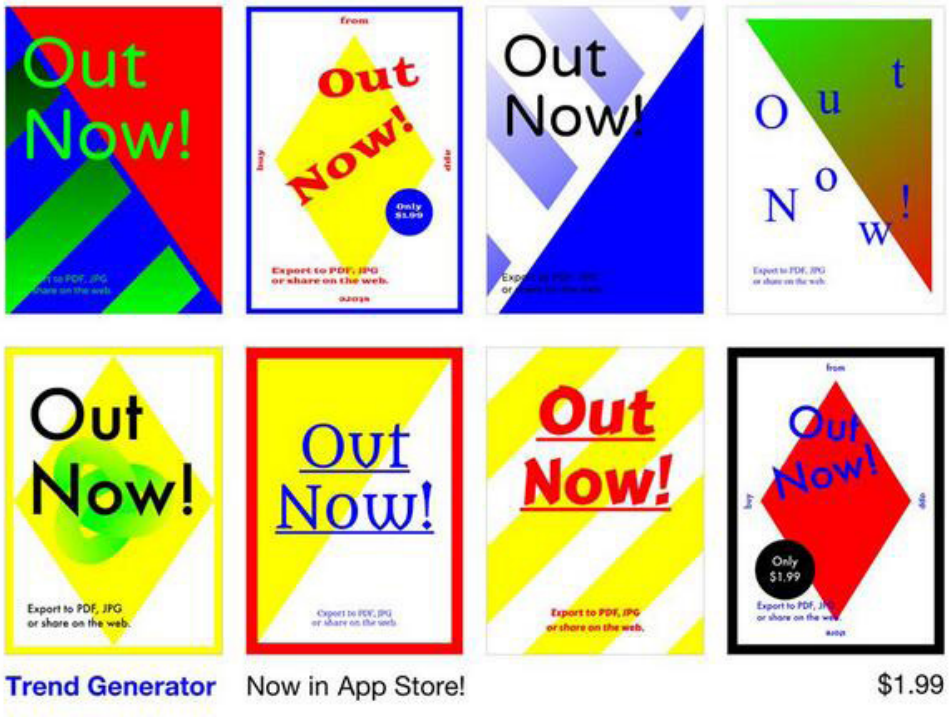
A lot of the work we do as designers is prescriptive. We work within set screen sizes and resolutions, to standardized paper formats with grids that have been calculated proportionally. We work with colors that have been numerically serialized and indexed, and can be developed into color systems mathematically. We create palettes of type styles from typefaces that are accessible online, can be categorized based on historical developments and genres, and laid out according to a base unit. These parts are modular and mechanical, perfect for automation. And a lot of our current workflow is pretty automated anyway—consider some of those tasks that would have been completed manually in years gone by, like typesetting.

This is not new thinking, of course. The Modernists were mucking about with modular principles back in the 1950s across all creative disciplines, from art to architecture; and Shakespeare and classical musicians from medieval to modern were experimenting with numerical limitations way before that. Plus, we've kind of been the monk many times in our history: first it was Gutenberg, then phototypesetting, then the Mac and Adobe, and after that came digital cameras and the internet. With each technological development came massive disruption and reaction, followed by an evolving of the role of the designer.

Tightly defined tasks can be automated pretty easily with tightly defined programming—outputs generated by hard lines of code. These kinds of algorithms have been used in design and the creative arts for some time.

Peart, R. (2016). Automation Threatens to Make Graphic Designers Obsolete. [online] Eye on Design. Available at: https://eyeondesign.aiga.org/automation-threatens-to-make-graphic-designers-obsolete/ [Accessed 15 Dec. 2018].



Autotrend App (2015)

In industry, there is blunt-force algorithmic tension – ‘Efficiency, capitalism, commerce!’ versus ‘Robots are stealing our jobs!’

ut for algorithmic art, the tension is subtler. Only 4 per cent of the work done in the United States economy requires ‘creativity at a median human level’, according to the consulting firm McKinsey and Company.

So for computer art – which tries explicitly to zoom into this small piece of that vocational pie – it’s a question not of efficiency or equity, but of trust. Art requires emotional and phrenic investments, with the promised return of a shared slice of the human experience. When we view computer art, the pestering, creepy worry is: who’s on the other end of the line? Is it human? We might, then, worry that it’s not art at all.

Roeder, O. (2016). There is no difference between computer art and human art – Oliver Roeder | Aeon Ideas. [online] Aeon. Available at: https://aeon.co/ideas/there-is-no-such-thing-as-computer-art-it-s-all-just-art [Accessed 15 Dec. 2018].

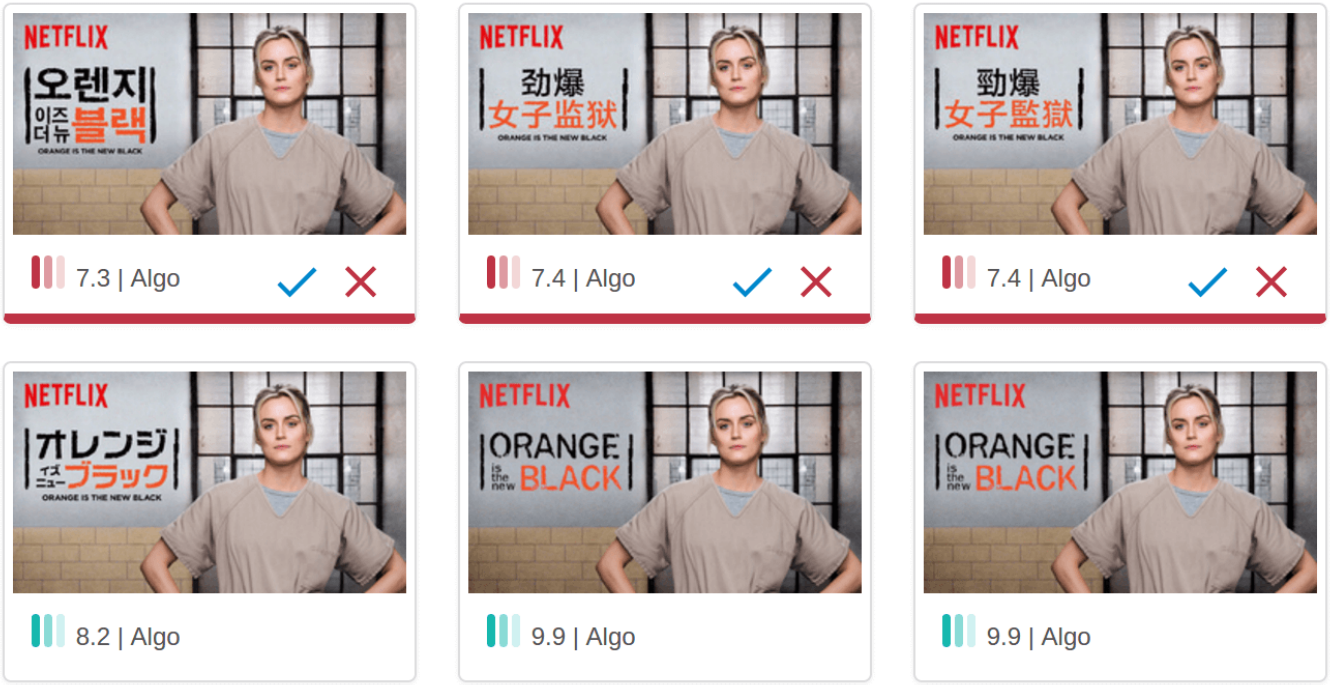
‘No matter what the future holds – and scientists predict a time when almost any kind of painting can be computer-generated – the actual touch of the artist will no longer play any part in the making of a work of art. When that day comes, the artist’s role will consist of mathematically formulating, by arranging an array of points in groups, a desired pattern. From then on, all will be entrusted to the deus ex machina. Freed from the tedium of technique and the mechanics of picture-making, the artist will simply ‘create’.’

Preston, S. (1965). The first exhibition of computer art review, The New York Times

But further than that, at a fundamental level, graphic design works as a kind of user interface; we organize information visually to allow people to navigate through and understand the world. As graphic designers we channel interactions through a primarily visual funnel, stripping out everything that can't be accommodated in the medium. But as sensors, processing power and machine intelligence become more portable, ubiquitous, and increasingly part of the designer's lexicon, we will one day find that our user interfaces are no longer primarily visual, but more sonic, haptic, and multi-sensory. With that comes a brand new palette of output at our disposal.

Allow me to take this to a more extreme conclusion: We're beginning to interface with our devices in more conversational terms as natural-language-processing algorithms improve, and in more gestural terms with improvements in computer vision and virtual reality. When coupled with renewed interest in anticipatory design, a massive signal appears pointing to a future in which graphic designers are barely required at all. But by taking a designer's mindset to problem-framing and solving, we have skills that position us well to help shape the deployment and development of this new artificial intelligence in design; helping to develop new tools, new interfaces, and new interactions that shape future worlds in unimaginably profound ways.

Peart, R. (2016). Automation Threatens to Make Graphic Designers Obsolete. [online] Eye on Design. Available at: https://eyeondesign.aiga.org/automation-threatens-to-make-graphic-designers-obsolete/ [Accessed 15 Dec. 2018].



Netflix extracting image metadata algorithm (2016)

To a large extent, machine learning systems can be seen as tools that assist or automate inductive reasoning processes. In a simple system that is governed by a small number of rules, it is often quite easy to produce a general theory from a handful of specific examples. Consider the following picture as an example of such a system.

Included:

Excluded:

Which of these are included?

Hebron, P. (2016). Machine learning for designers. O'Reilly Media, Inc.

‘Decades ago, someone came up with the term ‘computer-aided design,’ but what we’ve had up to now is really computer-aided documentation. Design has been accomplished solely in the head of the designer, and then the computer is used to document the outcome.’

Bruner, J. (2014). The automation of design. [online] O’Reilly Radar. Available at: http://radar.oreilly.com/2014/05/the-automation-of-design.html [Accessed 15 Dec. 2018].

THREE LEVELS OF MATURITY FOR DESIGN TOOLS:

First-generation systems mimic analogue tools with digital means.

The second generation is assisted creation systems, where humans and machines negotiate the creative process through tight action-feedback loops.

The third generation is assisted creation systems 3.0, which negotiate the creative process in fine-grained conversations, augment creative capabilities and accelerate the acquisition of skills from novice to expert.

Pieters, R. and Winiger, S. (2016). Creative AI: On the Democratisation & Escalation of Creativity. [online] Medium. Available at: https://medium.com/@creativeai/creativeai-9d4b2346faf3 [Accessed 15 Dec. 2018].

‘As soon as it works, no one calls it AI any more.’

Mccarthy, J. (2011). John Mccarthy. [online] Cacm.acm.org. Available at: https://cacm.acm.org/blogs/blog-cacm/138907-john-mccarthy/fulltext [Accessed 15 Dec. 2018].

However, I think that graphic design (in which I include web design as well), has already undergone the drastic effects of automation, at least in a broad sense. The Web is full of generators capable of producing endless permutations of logos. Some of these generators make use of neural networks and therefore have the ability improve their designs by «learning» from their mistakes. But there is no need to be a Singularity zealot to acknowledge the revolutionary impact of digital technology on graphic design. In the early '90s several desktop publishing applications found a widespread use among professionals and ordinary people alike. A few years later «photoshop» became a verb, and, together with other elements of the Adobe suite, it populated the collective imagination. The statements of the designers who were first inspired by computers are full of enthusiasm: «We are the primitives of a new technological era», the Emigre duo proclaimed, omitting that so was everyone else. At the same time, the work of these pioneers, full of proudly executed mishaps, seems to conceal a passive-aggressive form of Luddism.

Lorusso, S. (2017). What Design Can't Do — Graphic Design between Automation, Relativism, Élite and Cognitariat | ENTREPRECARIAT. [online] Networkcultures.org. Available at: http://networkcultures.org/entreprecariat/what-design-cant-do/ [Accessed 15 Dec. 2018].

Assisted Freehand Drawing (2011)

Think about your own mental process of recognizing a human face. It's such an innate, automatic behavior, it is difficult to think about in concrete terms. But this difficulty is not only a product of the fact that you have performed the task so many times. There are many other often-repeated procedures that we could express concretely, like how to brush your teeth or scramble an egg. Rather, it is nearly impossible to describe the process of recognizing a face because it involves the balancing of an extremely large and complex set of interrelated factors, and therefore defies any concrete description as a sequence of steps or set of rules.

To begin with, there is a great deal of variation in the facial features of people of different ethnicities, ages, and genders. Furthermore, every individual person can be viewed from an infinite number of vantage points in countless lighting scenarios and surrounding environments. In assessing whether the object we are looking at is a human face, we must consider each of these properties in relation to each other. As we change vantage points around the face, the proportion and relative placement of the nose changes in relation to the eyes. As the face moves closer to or further from other objects and light sources, its coloring and regions of contrast change too.

There are infinite combinations of properties that would yield the valid identification of a human face and an equally great number of combinations that would not. The set of rules separating these two groups is just too complex to describe through conditional logic. We are able to identify a face almost automatically because our great wealth of experience in observing and interacting with the visible world has allowed us to build up a set of heuristics that can be used to quickly, intuitively, and somewhat imprecisely gauge whether a particular expression of properties is in the correct balance to form a human face.

Hebron, P. (2016). Machine learning for designers. O'Reilly Media, Inc.

‘I’m building design tools that integrate intelligent algorithms with the design process; tools that try to make designers better by learning about what they’re doing. What we’re doing. Augmenting rather than replacing designers..’

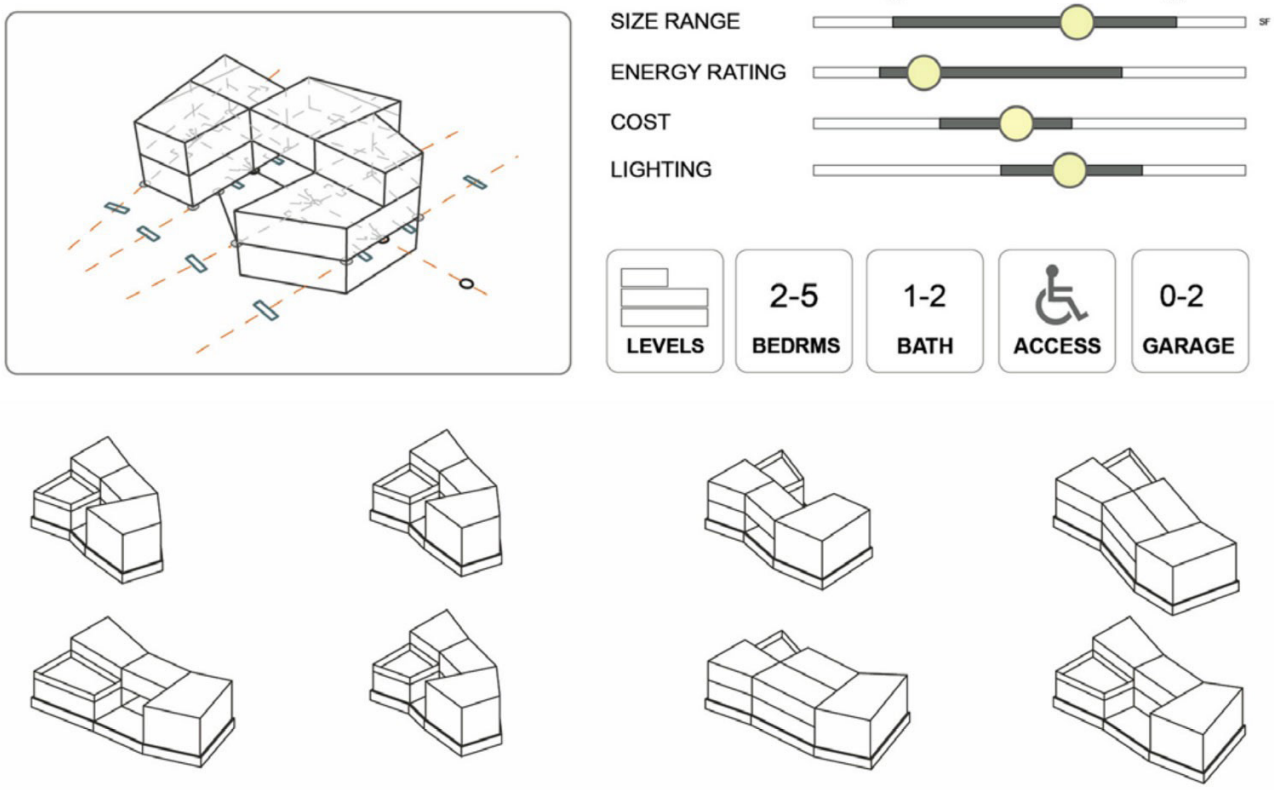
Gold, J. (2016). Taking The Robots To Design School. [online] Jon Gold’s blog. Available at: https://www.jon.gold/2016/05/robot-design-school/ [Accessed 15 Dec. 2018].

As today's rudimentary tools mature, AI experts see the field moving down DesignScape's path. In the next desktop publishing revolution, users will step back from hands-on labor and let the software generate ideas and plans. In this world, design work will become more like curation and management. Our tools will propose designs, and we will decide what works. But how useful—and how good—will the resulting designs be?

Of course, professional graphic designers have fretted about being replaced since the first versions of PageMaker and Quark fired up. One veteran who doesn't believe in worrying is John Maeda, currently the Head of Computational Design & Inclusion at Automattic, the parent company of WordPress. Maeda says he's been preparing for this latest wave of change since the 1990s: "In each decade, I have looked to acquire the skills that can keep myself ahead of the machine. I know it to be an impossible task, but I also don't give up easily. I guess I'm more of a warrior than a worrier. And I'm excited about the challenges that are coming to design."

If and when professional graphic designers hand over some of their responsibilities to machines—or get cut out of the creative process entirely—many might welcome the change, seeing it as a chance to step away from the computer, whether to work by hand or just take a break from the screen. If this second desktop revolution's AI algorithms save human designers time and make more room in their lives for reflection and creativity, it will win cheers all around. But those who want the software to function exactly like a professional designer should be careful what they wish for.

Tselentis, J. (2017). AI Will Turn Graphic Design On Its Head | Backchannel. [online] WIRED. Available at: https://www.wired.com/story/when-websites-design-themselves/ [Accessed 15 Dec. 2018].



"Housing Agency System: Mass-Customization System for Housing" by Autodesk (2012)

Designers make a lot of big and small decisions; many of them are hardly described by clear processes. Moreover, incoming requirements are not 100% clear and consistent, so designers help product managers solve these collisions — making for a better product. It's much more than about choosing a suitable template and filling it with content.

Surely, as in the case of The Grid, rejecting designers from the creative process leads to clichéd and mediocre results (even if it improves overall quality). However, if we consider this process more like «paired design» with a computer, then we can offload many routine tasks; for example, designers could create a moodboard on Dribbble or Pinterest, then an algorithm could quickly apply these styles to mockups and propose a suitable template. Designers would become art directors to their new apprentices, computers.

Algorithm-driven design should be something like an exoskeleton for product designers — increasing the number and depth of decisions we can get through. How might designers and computers collaborate?

This is a story of a beautiful future, but we should remember the limits of algorithms — they're built on rules defined by humans, even if the rules are being supercharged now with machine learning. The power of the designer is that they can make and break rules; so, in a year from now, we might define «beautiful» as something totally different. Our industry has both high- and low-skilled designers, and it will be easy for algorithms to replace the latter. However, those who can follow and break rules when necessary will find magical new tools and possibilities.

Vetrov, Y. (2016). Algorithm-Driven Design: How Artificial Intelligence Is Changing Design. [online] Smashing Magazine. Available at: https://www.smashingmagazine.com/2017/01/algorithm-driven-design-how-artificial-intelligence-changing-design/ [Accessed 15 Dec. 2018].

‘We’re approaching the point where one second of computing time on 10,000 computers working in parallel is as inexpensive as 10,000 seconds of computing time on a single computer.’

Bass, C. (2014). 3D Printing & Design - The Future of How Things are Made. [online] YouTube. Available at: https://www.youtube.com/watch?v=eAfVF1ne_1M [Accessed 15 Dec. 2018].

Of course, the work of architects and industrial designers has enough limitations and specificities of its own, but user interfaces aren't static — their usage patterns, content and features change over time, often many times. However, if we consider the overall generative process — a designer defines rules, which are used by an algorithm to create the final object — there's a lot of inspiration. The working process of digital product designers could potentially look like this:

An algorithm generates many variations of a design using predefined rules and patterns.

The results are filtered based on design quality and task requirements.

Designers and managers choose the most interesting and adequate variations, polishing them if needed.

A design system runs A/B tests for one or several variations, and then humans choose the most effective of them.

Vetrov, Y. (2016). Algorithm-Driven Design: How Artificial Intelligence Is Changing Design. [online] Smashing Magazine. Available at: https://www.smashingmagazine.com/2017/01/algorithm-driven-design-how-artificial-intelligence-changing-design/ [Accessed 15 Dec. 2018].

‘Meta-design is much more difficult than design; it’s easier to draw something than to explain how to draw it.’

Knuth, D. (2000). METAFONT: the program. Boston, Mass: Addison-Wesley.

My concerns as a designer reach far beyond those of the reaches of design criticism. I am concerned with the ways in which the methodologies, practices, and artifacts of design shape the world around us, and with the implicated rinse of ideology contained in many aesthetics and forms.

For the sake of brevity (yes, this paper is my version of brevity), I cut out two sections of this paper — "Why Automation?" and "The Complicity of Designers and Businesses." The goal of these sections was not only to elucidate why capitalism has led to the mentality "anything that can be automated, will be automated," but also to interrogate the role and responsibility of designers and businesses in a world in which these two groups are able to exercise concerning levels of control over the daily lives of people everywhere. While these sections are not included here, I felt it important to write a brief afterword to say this: design is always implicitly rinsed with the political. Like natural gas permeating the air of a kitchen, design is so soaked with power that at any moment it can create ruptures and explosive tensions in society. And this power becomes very problematic when artifacts of design and their aesthetic tendencies begin to seep into the background of society, becoming ubiquitous and widely accepted.

The key to this entire paper has been that the aesthetics of automation are a signifying device, a clue, hinting at underlying sentiments, apparatuses, and power relations that exist in the context of automation's existence. While this paper has been a relatively expansive exploration of automation, efficiency, and their aesthetic vernaculars, I am sure that this critique is only the beginning; there is much more work to be done here, many more dark corners to illuminate. All aesthetics contain political undertones, and more often than not, these undertones go unnoticed, unchecked, and unexamined. The wide field of aesthetic and mechanical gestures in today's world still requires a great deal of illumination; and I intend to light the torch.

Halladay, D. (2018). The Aesthetics of Soft Automation — Infinite Caesura. [online] Infinite Caesura. Available at: https://infinitecaesura.com/entries/aesthetics-of-automation/#3-the-aesthetics-of-automation [Accessed 15 Dec. 2018].

Generative Column Design, created with digital manufacturing, by Michael Hansmeyer (2010)

As Lyotard states in ‘Paradox of Graphic Arts’, Graphic arts derive both from communication and from art, which carries out a lot of contradiction and results in having ethical, rhetorical, aesthetic, and commercial sides of the job implemented as one. This, in its turn, requires the designer to find a solution to a set of multidisciplinary, even contradicting problems. One of these problems would be that designers at the same time need to convey a clear a message about the piece stated by the technical task but it also needs to be fascinating in order to be interesting enough to attract attention of the final customer (viewer).


musee d'orsay example:
painting loses to photography
writing loses
to web (does it?)
reconsideration of
literature
the world powered
by the language
code and writing
code and writing
Charles Bernstein, "Lift Off"
wikipedia
favicon
Stéphane Mallarmé's "Un coup de dés jamais n'abolira le hasard"
"The Public Computer Errors Pool"
the act of reading = the act of decoding
other examples
language acting upon more language
Shakespeare: image and sonnets
"Quantity Is the New Quality"
using words as a metric
language materiality
boom of text
based forms
A Textual Ecosystem
"Image World", 1990
James Joyce's Ulysees
Identifying – weighing – language
"The Rise of the Image, the Fall of the Word"
Data
textual microclimates
the infinite variety of textual occurrences

Machine-learning techniques are now widely used to optimize complex information systems. A genetic algorithm starts with a fundamental description of a desired outcome—say, an airline timetable that's optimized for fuel savings and passenger convenience. It adds in constraints—the number of planes an airline owns, the airports it operates in, and the number of seats on each plane. It loads what you might think of as independent variables—details on thousands of flights from an existing timetable, or perhaps randomly generated dummy information.

The algorithm tests that timetable against the optimization goals, discerns the effect that each change to the timetable might have on its performance against the goals, adjusts the timetable incrementally, and tests again. It might also ingest data on past performance—data that might not have any evident pattern in itself, but that enriches the model.

Over thousands, millions, or billions of iterations, the timetable gradually improves to become more efficient and more convenient. And the algorithm gains an understanding of how each element of the timetable—the takeoff time of flight 37 from O'Hare, for instance—affects the dependent variables of fuel efficiency and passenger convenience.

Researchers have looked for ways to apply this kind of iterative optimization to physical design for decades, initially applying it to specialized objects with well-defined optimization goals, like antennas. In 2006, NASA launched three spacecraft with so-called evolved antennas that "resemble bent paper clips," making those the first generatively designed objects to fly in space. Today, lattices and other complex, structurally critical elements are often designed generatively.

Bass, C. (2014). 3D Printing & Design - The Future of How Things are Made. [online] YouTube. Available at: https://www.youtube.com/watch?v=eAfVF1ne_1M [Accessed 15 Dec. 2018].

‘The time required to test an idea should be zero.’

Benjamin Wilkins
Airbnb Design technologist

That optimization engine can go all the way down to individual toolpaths in the manufacturing process, thanks to closer linkages between software and industrial tools, so a designer might ask the software to minimize waste or balance cost against environmental impact from materials.

Rather than spend their time trying out different technical solutions, designers can summon an optimized solution and focus on aspects of design that are harder to quantify, like aesthetics and human experience. Kowalski thinks the change will make design much more broadly accessible. “Think of the human capital and monetary capital required to bootstrap these things,” he says. “To the extent we’re able to reduce or limit those, we make design more available to more interested parties.”

In the past, sophisticated designs were only available to big companies with a lot of resources; now, they’re accessible to small-scale entrepreneurs and people who don’t necessarily have design or technical expertise. “They don’t even need a computer; they just need a Chromebook,” says Kowalski, “and that follows exactly the trajectory of people who create music, videos, and so forth on the web.”

Bruner, J. (2014). The automation of design. [online] O’Reilly Radar. Available at: http://radar.oreilly.com/2014/05/the-automation-of-design.html [Accessed 15 Dec. 2018].

‘Twenty-five years ago, if you asked people whether a computer could help you navigate around the city, they’d have said that’s ridiculous — you can’t digitize and encapsulate all of those streets in a single system,. But all of that simply takes work, and it’s available to us now.’

Bruner, J. (2014). The automation of design. [online] O’Reilly Radar. Available at: http://radar.oreilly.com/2014/05/the-automation-of-design.html [Accessed 15 Dec. 2018].

From our perspective here in 2025, it all seems inevitable. But maybe it wasn't.

When Adobe released the desktop publishing software PageMaker 6.0 in 1995, it started monitoring and collecting its users' activity online. In one of the many black-and-white booklets inside its colourful box, it is still possible to read in the fine print that 'data related to the customers' use of our software will be collected to improve our products'. After just three years, the company had to build a large compound in the outskirts of Ottawa to store all the information being gathered. By the time Adobe Creative Suite was released in 2003, more than 180 engineers were working exclusively in managing, categorising and processing all the data generated by programs such as Photoshop, Illustrator, InDesign, Acrobat, Premiere Pro, Dreamweaver and After Effects. But this task was consuming too many human resources and was not cost-effective.

As automated tasks 'to optimise workflow' became popular among designers – the number of people working in data processing was cut to a third and replaced by bots. These bots could categorise and archive all the data generated by the software packages' users – mainly graphic designers. On an almost global scale, they were able to produce detailed reports on habits, processes, steps taken, recurrent detours, variations and the final product. When Adobe bought the online portfolio-showcasing platform Behance in 2012, the aim of tracking every designer's activity was made evident, although disguised as just a 'boost to empower creativity' and launch their next product, Adobe Creative Cloud. But the goal was not to empower designers, but to automate profit. The Creative Data Library was ready to be explored. Soon there was no alternative for anyone needing to design but to pay for a subscription. Software had effectively flattened tools, process and output into an inevitable standardisation. The global homogenisation of graphic design and visual culture was a key political conquest to further push consumer control and its respective monetisation.

Laranjo, F. (2016). Automated Graphic Design | Modes of Criticism. [online] Modes of Criticism. Available at: http://modesofcriticism.org/automated-graphic-design/ [Accessed 15 Dec. 2018].

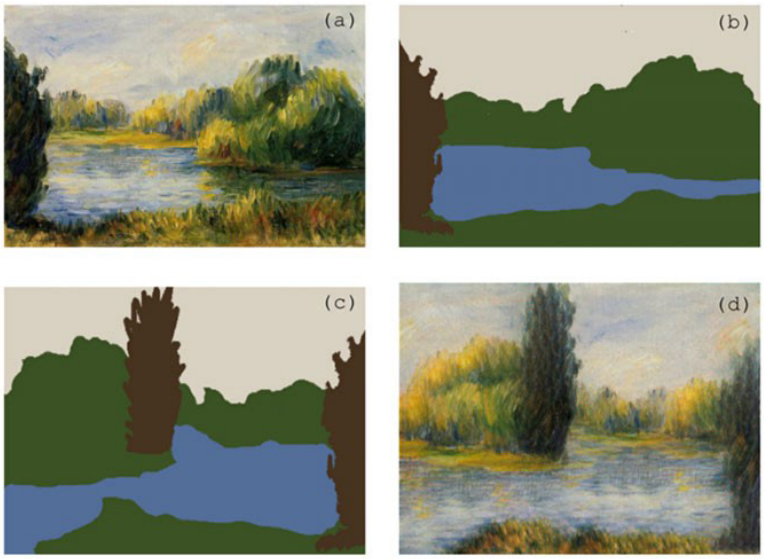


Figure 1: Synthesizing paintings with deep neural networks via analogy. (a) Original painting by Renoir, (b) semantic annotations, (c) desired layout, (d) generated output.

As a discipline, web design has already exhausted its possibilities, an emerging combination of tech and cultural trends highlight the need for a broader approach.

Symptom 1: Commoditization by templates

Most of the content that you see on the web today is run by some framework or service — WordPress, Blogger, Drupal, you name it. Frameworks provide you a foundation and shortcuts so you spend less time struggling with the creation of a web site, and more time creating content.

As a consequence of the ubiquity of these frameworks, a whole world of free and paid templates lets you get started with a professional-looking design in minutes. Why hire a web designer if you can achieve a fairly acceptable design for a fraction of the cost using a template? Actually, many web designers (especially the ones on the cheaper side) just pick a pre-made template and make some minor branding customizations.

Either way, if your web page is a standard, informational one, there's probably a template out there that can do the job for you.

Symptom 2: Web design patterns are mature

What is the latest web design innovation you can point a finger on? Responsive design? That's digital ages old. Parallax? Useless eye-candy. The web has had all the user interface components and patterns you might need for a while now (and no, parallax is not something we really ever needed). And that's why you don't see much innovation in web patterns as of late.

This maturity is good for users: they will find consistency in their daily use of the web. Checkout forms, shopping carts, and login pages should all behave in a similar way. Trying to get creative at this point will probably be pointless or even harmful.

Symptom 3: Automation and artificial intelligence are already doing the job

There's a new trend of automated web design services, arguably started by The Grid. It's a service to build basic websites which makes design decisions — semantic ones — based on artificial intelligence. It analyzes your content to detect the best layouts, colors, fonts, and extra imagery for your site. Using cleverly chosen design basics (made by humans) as the foundation, it's hard to go wrong with it, and the result

will probably be better than what an average web designer can do.

When something can be successfully automated, it means that its practices and standards are established enough as not to need much human input. And this is obviously the beginning. There will be a fierce competition about which service can deliver better designs, faster, and with less human intervention.

Symptom 4: Facebook pages as the new small-business homepage

In the late 1990's, future-minded businesses would buy their .com's, purchase expensive hosting plans, and hire a «web master» in order to have The Web Page, the one that would make them visible to the rest of the Internet. By 2005, creating a site in Blogger or WordPress.com was more than enough for your new wedding photo business (it was also quick and free).

Today, this function has been completely overridden by Facebook pages. They are free, made to be viral out of the box, offer powerful tools only available to big businesses a decade ago (like subscription for updates or media posting), and are as easy to set up as your own profile page. They are so efficient in making a business visible that they are rendering basic web pages useless.

Symptom 5: Mobile is killing the web

How often do you visit a web site from your mobile device by directly typing the address? Only when you don't have the app, right? People don't seem to think much in terms of web pages these days: they think of digital brands, which mostly translate to apps or subscriptions (likes, follows, etc). That's why most big websites, blogs, and portals are pushing their mobile apps to you — out of home screen, out of mind.

Mobile web has always been slow and cumbersome. Typing addresses is weird. Navigating between tabs is weird. Our underpowered mobile devices and saturated data networks don't help create a smooth web experience like the one we have in our desktop machines.

As vital as responsive web design is (not adopting it is commiting digital suicide), it only guarantees that your user can view your page in a mobile device, if she ever finds it in first place. And the limited space in her mind is already mostly occupied by apps.

Nouvel, S. (2015). Web design is dead. [online] Mashable. Available at: https://mashable.com/2015/07/06/why-web-design-dead/#5.K2QGmmbgqw [Accessed 15 Dec. 2018].

But the honest-to-God truth, at the end of all of this, is that this whole notion is in some way a put-on: a distinction without a difference. ‘Computer art’ doesn’t really exist in an any more provocative sense than ‘paint art’ or ‘piano art’ does. The algorithmic software was written by a human, after all, using theories thought up by a human, using a computer built by a human, using specs written by a human, using materials gathered by a human, at a company staffed by humans, using tools built by a human, and so on. Computer art is human art – a subset rather than a distinction. It’s safe to release the tension.

Roeder, O. (2016). There is no difference between computer art and human art – Oliver Roeder | Aeon Ideas. [online] Aeon. Available at: https://aeon.co/ideas/there-is-no-such-thing-as-computer-art-it-s-all-just-art [Accessed 15 Dec. 2018].

‘The real philosophical lessons of AI will have less to do with humans teaching machines how to think than with machines teaching humans a fuller and truer range of what thinking can be.’

Premsela, B. (2015). Lecture: On A.I. and Cities: Platform Design, Algorithmic Perception, and Urban Geopolitics. [online] Benno Premsela Lectures. Available at: https://bennopremselalezing2015.hetnieuweinstituut.nl/en/lecture-ai-and-cities-platform-design-algorithmic-perception-and-urban-geopolitics [Accessed 15 Dec. 2018].

“Web design is dead.” http://mashable.com/2015/07/06/why-web-design-dead/

No, it isn’t. Generic solutions are dead. Soulless theming and quick skinning are dead. Our solutions have to be better and smarter. Less templates, frameworks and trends and more storytelling, personality and character. Users strive for good stories and good photography; they appeal for good visuals and interesting layouts; they can’t wait for distinctive and remarkably delightful user experiences. And that should be exactly our strategy to create websites that stand out.

There are way too many badly designed experiences out there, and there is so much work for us to be done. Proclaiming our craft to be dead is counter-productive, because we showed to ourselves and everybody out there what we are capable of. Last fifteen years of web design were nothing but outstanding in innovation and experimentation. And it’s not about to stop, it’s just not who we are.

If we can’t produce anything but generic work, other creatives will. The web has to get better, and it’s our job to make it better. Nobody said that it’s supposed to be easy though; if we don’t adapt our practices and techniques, we’ll have to give way to people who can get it done better than we do—but web design itself isn’t going anywhere any time soon.

Friedman, V. (2015). Web design is not dead. [online] Facebook.com. Available at: https://www.facebook.com/vitaly.friedman/posts/10155740174175573 [Accessed 15 Dec. 2018].

Zeldman (2015). Twitter post by @zeldman. [online] Twitter.com. Available at: https://twitter.com/zeldman/status/611187696271290368 [Accessed 15 Dec. 2018].

Conclusion

PROS

If we look in the near term, the value of this approach is more or less clear:

Remove the routine of preparing assets and content, which is more or less mechanical work.

Broaden creative exploration, where a computer makes combinations of variables, while the designer filters results to find the best variations.

Optimize a user interface for narrow audience segments or even specific users.

Quickly adapt a design to various platforms and devices, though in a primitive way.

Experiment with different parts of a user interface or particular patterns — ideally, automatically.

Altogether, this frees the designer from the routines of both development support and the creative process, but core decisions are still made by them. A neat side effect is that we will better understand our work, because we will be analyzing it in an attempt to automate parts of it. It will make us more productive and will enable us to better explain the essence of our work to non-designers. As a result, the overall design culture within a company will grow.

CONS

However, all of these benefits are not so easy to implement or have limitations:

We can only talk about a company's custom solutions in the context of the company's own tasks. The work requires constant investment into development, support and enhancement.

As The Grid's CMS shows, a tool alone can't do miracles. Without a designer at the helm, its results will usually be mediocre. On the other hand, that's true of most professional tools.

Breaking past existing styles and solutions becomes harder. Algorithm-driven design is based on existing patterns and rules.

Copying another designer's work becomes easier if a generative design tool can dig through Dribbble.

There are also ethical questions: Is design produced by an algorithm valuable and distinct? Who is the author of the design? Wouldn't generative results be limited by a local maximum? Oliver Roeder says that «computer art» isn't any more provocative than «paint art» or «piano art.» The algorithmic software is written by humans, after all, using theories thought up by humans, using a computer built by humans, using specifications written by humans, using materials gathered by humans, in a company staffed by humans, using tools built by humans, and so on. Computer art is human art — a subset, rather than a distinction. The revolution is already happening, so why don't we lead it?

Vetrov, Y. (2016). Algorithm-Driven Design: How Artificial Intelligence Is Changing Design. [online] Smashing Magazine. Available at: https://www.smashingmagazine.com/2017/01/algorithm-driven-design-how-artificial-intelligence-changing-design/ [Accessed 15 Dec. 2018].

Glossary

A/B Testing –
Randomized experiment with two variants, A and B.[1] [2] It includes application of statistical hypothesis testing or «two-sample hypothesis testing» as used in the field of statistics. A/B testing is a way to compare two versions of a single variable, typically by testing a subject's response to variant A against variant B, and determining which of the two variants is more effective.

Anticipatory design –
The word anticipatory comes from the Latin anticipare, which means "taking care of ahead of time." We normally associate it with something that happens, is performed or felt in anticipation of something. In a way, most products contain at least one element of anticipation. Aaron Shapiro from HUGE defined anticipatory design as a method where it's up to the designer to simplify processes as much as possible for users, minimizing difficulty by making decisions on their behalf.

Augmentation –
The action or process of making or becoming greater in size or amount. Referring to automation subject, the process of contiously generated output via generative design (iterations).

Algorithm –
In mathematics and computer science, an algorithm is an unambiguous specification of how to solve a class of problems. Algorithms can perform calculation, data processing and automated reasoning tasks.

Atomic design –
Atomic design is a methodology composed of five distinct stages working together to create interface design systems in a more

deliberate and hierarchical manner. The five stages of atomic design are:

Atoms
Molecules
Organisms
Templates
Pages

AI (Artificial Intelligence) –
Sometimes called machine intelligence, is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and other animals. In computer science AI research is defined as the study of «intelligent agents»: any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals.The term «artificial intelligence» is applied when a machine mimics «cognitive» functions that humans associate with other human minds, such as «learning» and «problem solving».

Defaultism –
Defaultism is a movement towards a lack thereof. It could be described less as laziness and more as an ascetic aesthetic, as it takes great will to do nothing at all. When torn between the ultra-distilled utilitarianism of modernism and the radical entropy of postmodernism, the easiest way out is to do nothing at all.

Declarative design –
In computer science, declarative programming is a programming paradigm—a style of building the structure and elements of computer programs—that expresses the logic of a computation without describing its control flow.

Generative design –

Generative design mimics nature's evolutionary approach to design. Designers or engineers input design goals into generative design software, along with parameters such as materials, manufacturing methods, and cost constraints. Unlike topology optimization, the software explores all the possible permutations of a solution, quickly generating design alternatives. It tests and learns from each iteration what works and what doesn't.

Globalization –

Cultural globalization refers to the transmission of ideas, meanings, and values around the world in such a way as to extend and intensify social relations.This process is marked by the common consumption of cultures that have been diffused by the Internet, popular culture media, and international travel. This has added to processes of commodity exchange and colonization which have a longer history of carrying cultural meaning around the globe. The circulation of cultures enables individuals to partake in extended social relations that cross national and regional borders. The creation and expansion of such social relations is not merely observed on a material level. Cultural globalization involves the formation of shared norms and knowledge with which people associate their individual and collective cultural identities. It brings increasing interconnectedness among different populations and cultures.

Input/output –

In computing, input/output or I/O (or, informally, io or IO) is the communication between an information processing system, such as a computer, and the outside world, possibly a human or another information processing system. Inputs are the signals or data received by the system and outputs are the signals or data sent from it. The term can also be used as part of an action; to «perform I/O» is to perform an input or output operation.

Iteration –

Iteration is the repetition of a process in order to generate a (possibly unbounded) sequence of outcomes. The sequence will approach some end point or end value. Each repetition of the process is a single iteration, and the outcome of each iteration is then the starting point of the next iteration.

Machine learning –

Machine learning is the study of algorithms and statistical models that computer systems use to progressively improve their performance on a specific task. Machine learning algorithms build a mathematical model of sample data, known as «training data», in order to make predictions or decisions without being explicitly programmed to perform the task. Machine learning algorithms are used in the applications of email filtering, detection of network intruders, and computer vision, where it is infeasible to develop an algorithm of specific instructions for performing the task. Machine learning is closely related to computational statistics, which focuses on making predictions using computers.

Meta-design –

Metadesign (or meta-design) is an emerging conceptual framework aimed at defining and creating social, economic and technical infrastructures in which new forms of collaborative design can take place. It consists of a series of practical design-related tools for achieving this. As a methodology, its aim is to nurture emergence of the previously unthinkable as possibilities or prospects through the collaboration of designers within interdisciplinarity ‘metadesign’ teams. Inspired by the way living systems work, this new field aims to help improve the way we feed, clothe, shelter, assemble, communicate and live together.

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