Diseña 19 | Visual Methods for Online Images: Collection, Circulation, and Machine Co-Creation

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In a networked image-saturated society —in which images link to other images across sources and platforms— methods for visual analysis gain urgency. While the correlation between the growing importance of the visual and the increase in visual research methods should not be taken for granted (Rose, 2014), the question of how to deal with visual abundance remains substantive, particularly for design research. One also needs to account for the variety of practices, the human and non-human actors engaging with images online, and the multiple functions that online visuals may have beyond their representational power. Considering the diversity of formats and uses, 'online images', as we term the object of study in the title of this issue, might seem a shallow oversimplification: YouTube videos, binge-watched through autoplay, drive users towards extremist news ecologies (Tuters, 2020) and misinformation (Tang et al., 2021); celebrities and influencers raise awareness on social issues in their Instagram posts (Niederer & Colombo, 2021), while a massive computer vision infrastructure constantly scans every bit of visual content shared on digital platforms (Paglen, 2016); Facebook reactions work as a shortcut for engagement (Geboers et al., 2020); memes, GIFs and emojis carry layer meanings, raising questions of interpretation (Highfield & Leaver, 2016); stock photography is recycled across multiple online sites (Aiello & Parry, 2019), while platform-specific affordances, catering to a variety of users' needs (Bucher & Helmond, 2018) allow for the rise of platforms' visual vernaculars (Niederer, 2018; Pearce et al., 2020). How to interface such a kaleidoscopic panorama?

The proposition we make with this special issue of *Diseña* is to remain as close to the material as possible. How to approach (or tame) the visual *with* the visual? What type of images may one design to make sense of, reshape, and reanimate online image collections? The question at hand is how different arrangements of images may promote various analytical procedures, participatory actions, and design interventions. Furthermore, we focus on the role that algorithmic tools, including machine vision, can play in such research efforts, while being sensitive to their flaws and shortcomings, in particular concerning issues of interpretation, classification, and representation (Buolamwini & Gebru, 2018;

Crawford & Paglen, 2019; Geboers & Van De Wiele, 2020; Sinders, 2020). Which kinds of collaborations between humans and machines can we envision to better grasp and critically interrogate the dynamics of today's digital visual culture?

Indeed, this issue surfaces a variety of formats and practices, including, but not limited to, *tableaux*, visual scores, machine vision, image networks, data visualization, field guides, performing, developing, image grids, and video catalogs. In all, they offer a range of approaches for interfacing online images that seek to understand, reanimate, republish, and change perspectives on our digital visual culture. The diversity of stances, tools, research traditions, and methods that emerge from this issue resonate with the variegated landscape of visualities described above. In a way, such diversity offers evidence that the field of digital visual research requires situated, tailored, and interdisciplinary approaches.

As the title reads, the call for this special issue invited contributions in three different research areas: collection, circulation, and machine co-creation. First, taking the argument that online images require to be studied *en groupe* (Colombo, 2019), we invited contributors to reflect on the collection of images as a research object. Online, the individual image fades in favor of grouping formats such as "strings, threads, sets, [and] grids" (Lister, 2013, p. 8). Furthermore, new "filmic ways of seeing images" arise (Sze, 2018). Therefore, we asked: how does one freeze a never-ending stream of visual content to understand it? How does one demarcate collections of visual content to make them ready to be studied? Which visual techniques, formats, and situations can be designed to collect and recompose online images and videos?

Second, drawing from Hito Steyerl's notion of 'circulationism' (2013), a new visual online regime in which images gain strength through their circulation across sites, platforms, and search engines, we turned the attention towards visual methods to trace image paths. How do images travel across online media and how are they transformed along the way? What are visual ways of capturing and tracing these routes and transformations? Moreover, how can one design visualizations of these travels across platforms and through time, doing justice to the role of the platforms, the experience of the users, and the transformative journey of images themselves? In doing so, we particularly welcomed perspectives that contribute to feminist data research and visualization (D'Ignazio & Klein, 2020) and incorporate ethics of care in digital visual research.

Third, given the rise of machine vision infrastructures, mainly invisible to human eyes (Paglen, 2016), we call for methods that bring humans back into automated visual culture. How does one repurpose computer vision algorithms for the analysis of online images? The auditing and critical analysis of these algorithms is also an urgent task. How do different machine vision algorithms compare? At the same time, machines can even be the ones (co-)producing

images. Where concerns over synthetic images have seared since the streaming of the first 'deep fake' video (Burkell & Gosse, 2019), how else can we work with machines in creative co-production? What design and artistic outputs can be co-authored with machines?

Given the complex nature of online visual culture, multiplicity, circulation, and automation can hardly be tackled in isolation. The contributions included in this special issue signal the entanglement of these three research avenues. Furthermore, the contributors' diverse research backgrounds (including new media researchers, designers, programmers, and artists) and skills confirm the need for (human and non-human) collaborations to face the challenges present when studying a variegated and ever-changing digital visual culture.

Using machine vision to study online *natively* digital images

Janna Joceli Omena, Elena Pilipets, Beatrice Gobbo, and Jason Chao illustrate the value of layered and composite methods for the analysis of natively digital images. Their contribution explores the potential of one machine vision infrastructure (namely Google Vision API) to study online image collections. They compile a suite of methods that is not limited to content analysis but also considers circulation patterns and sites of *audiencing*. Working with the interpretative model of the network and building on the affordances of Google vision API, they offer three complementary methods: image-label network, image-web entities network, and image-domain network. The result is a layered methodological toolkit that, shifting "between different perspectives on the same image dataset", helps address "the multiplicity of *natively* digital images." In meticulous detail, the process is accounted for through a research protocol diagram that exposes the "*thick* layers of technical mediation, and researchers' interventions" involved in interpreting online images with machine vision. Apart from the methodological contribution, the text also represents, more generally, a critical view on algorithmic ways of seeing, a kind of empirical auditing of the research affordances of computer vision that shows how "image description gains different meanings depending on what technological grammar is used."

Google Images, climate change, and the disappearance of humans

In another visual and multilayered approach to a collection of images, Warren Pearce and Carlo De Gaetano study the temporal shift (or lack thereof) in the online visual representation of climate change. Their contribution proposes a twofold visualization of high-ranked images on Google Images for the query 'climate change' over a twelve years timespan. Through the simple but yet compelling format of the image grid, they perform a qualitative analysis of top images over time, matched by distant reading with computer vision labels of a more extensive set

of images. Compared through visual juxtaposition, the two perspectives keep together "the specificity and nuance" of qualitative analysis with the detection of "macro-level patterns across a large corpus of images." They find a homogenous and narrowing visual vernacular of climate change, in which humans are almost absent. The method also interrogates the limits of the ranking algorithm of Google Image Search, where the principle of visual consistency that drives the results of a search query "brings unintended consequences for political concepts such as climate change."

Data-driven curated video catalogs: republishing video footage

Chaining together different machine vision techniques, Gabriele Colombo and Federica Bardelli work with a collection of YouTube video footage that documents the 2019 Venice floods. Their contribution presents data-driven curated video catalogs as a format for republishing video material for a type of visual analysis that goes "beyond traditional forms of measurement." In their project, inspired by the techniques of video supercut and visual catalogs, an editorial selection of video footage is reorganized into thematic video series through various algorithmic processes, including image segmentation and analysis. The process, detailed step-by-step, outputs a "jittery assemblage of close-ups on algorithmically detected objects and motifs," serving both an analytical and expressive goal.

Creating AI art responsibly: a field guide for artists and designers

The urgent contribution by Claire R. Leibowicz, Emily Saltz, and Lia Coleman is a field guide for 'Creating AI Art Responsibly' that offers artists and designers working with AI the conceptual tools "to better situate their work within a responsible AI practice." Their guide, which "strategically avoids being prescriptive," is structured around four checkpoints of the machine co-creation process. The authors invite artists and designers working with AI to (1) critically interrogate the training sets used, (2) reflect on "the history and supply chain of the AI architectures they are using," (3) consider the training resources used and their environmental costs, and (4) find a balance between the need for process transparency and "the threats and unintended consequences associated with publishing work." In all, the field guide delivers questions and provocations for the formation of a creative AI field "attentive to the societal impacts of its work."

Developing online images. From visual traces to public voices

Donato Ricci, design studio Calibro, Duncan Evennou, and Benoît Verjat discuss the process of *developing* online images for collective participation. Their contribution accounts for an array of more-than-textual techniques that progressively transform image sets into "participatory formats for collective, both speculative

and performative, expressions." Narrated through the methodological steps of the 'DEPT.' project, in which online images are used to initiate a collective reflection on urban politics and aesthetics, the 'developing register' aims at republishing networked visual materials into a "progressive cascade of visual artifacts" for participatory and collective inquiry. Moving back and forward across data visualization, algorithmic processing, editorial choices, and performative actions, the authors describe the pitfalls and opportunities of developing online visuals into formats that are not just to see and read images, but "aimed at *saying* something *with* them (...) and *doing* something *through* them." While the experiments described in the text are tightly linked to the contexts and situations in which they took place (Rijeka, Porto, and Paris), and rightfully so, they offer a rich and malleable vocabulary of techniques for those interested in using online images in collaborative settings: *fixing* image collections into data and media visualizations that reveal general patterns; *expanding* the visualizations into *catalogs* to be used as speculative prompts; *revealing* personal narratives into annotated *tableaux*; and then *performing* personal narratives through collective *scores* "accounting for (...) the alignment of various individual experiences altogether." The formats, actions, and situations described in the text constitute a valuable toolkit for developing digital (visual) traces into public voices, one that is sensitive to the networked nature of online images and that honestly engages with the traps of collective inquiry.

Conversations about feminist data practices with Catherine D'Ignazio, Lauren Klein, and Maya Livio

We conclude this issue with conversations about feminist data practices with Catherine D'Ignazio, Lauren Klein, and Maya Livio. The critical perspectives offered by feminist data practices are crucial to this issue, particularly in light of the extensive use of machine vision and other data-intensive techniques that take place throughout the contributions. Catherine D'Ignazio and Lauren Klein recognize the need for intersectional feminist ethics in data science and, as expressed in the title of their book, to put forward the notion of *Data Feminism* (2020). During the interview, they note how art and design are always at the foreground of speculative critique by conceptualizing alternatives and 'what if' scenarios. D'Ignazio and Klein also invite us to embrace complexity when aiming for a feminist approach to data work, committing ourselves to the struggle while being aware of our standpoints and limitations. For her part, Maya Livio researches technologies for non-humans and applies feminist methods to her projects (and lab). She invites us to cultivate attention to our (often unspoken and unwritten) methods and practices and reach out to those excluded from collaborative spaces. Together, these conversations offer much-needed critical reflections and practical advice for integrating a feminist approach to our design and research work. ◘

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