Some Variations on a Counter-functional Digital Camera

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Abstract

This Pictorial takes a different look at digital cameras and photos. It frames this look within a counterfunctional design perspective. This works is presented not as a design process documentation, but rather as a type of visual-textual design artifact. We see it as a means to present new concepts composed of both the textual-theoretical and visual-designerly varieties. While cameras and photos are the ostensible thematic focus, these technologies are in turn used as a focusing device for a broader conceptual theme: designing digital limitations.

Authors Keywords

limitations, critical design, design fiction, speculative design, photography, digital imagery.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

→ This Pictorial takes a different look at digital cameras and photos. It frames this look within a counterfunctional design perspective. This approach involves first identifying common positive features of a certain technology and then designing around the absence or restriction of these features. The selected concepts presented here depict an array of counterfunctional camera variants. These variants can be read as concepts worthy of further articulation or design directions worthy of future exploration (or else ideas best left unpursued in their present form). Whatever the case, the larger proposal is that these counterfunctional concept variants offer a useful (counter)perspective on cameras, photos, images, digital media and interactive techology. While cameras and photos are the ostensible thematic focus, these technologies are also a focusing device for a broader conceptual theme: designing digital limitations.

This work can be read as a companion piece to our DIS Paper "Counterfunctional Things: Exploring Possibilities in Designing Digital Limitations" (Pierce & Paulos, 2014). But this Pictorial has been specifically created so that it can be read independently of that paper.[1] This work is not a process documentation or a tool used within a design process (although it can be traced to such documents).[2] Rather the current document is presented as a type of visual-textual design artifact (one with a schematic visual character). We see it as a means to present new concepts composed of both the textual-theoretical and visual-designerly varieties.

The concepts that follow pivot around 6 thematic counterfeatures, which contrast with common features of current digital photographic technologies. Placed within a historical context [3], some of these counterfeatures recall earlier technologies (and nostalgic sentiments), while others introduce distinctly digital counterdirections.

Unviewable Digital Images

Single-Impression Digital Cameras

Immutable Digital Images

Inaccurate & Imprecise Digital Photography
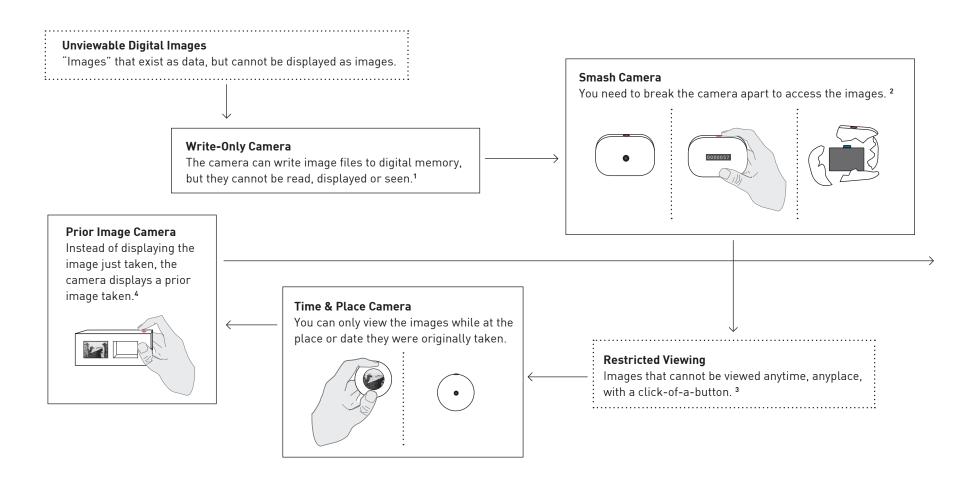
Ephemeral Digital Images

Absent Digital Images

1. The Paper/Pictorial companion format parallels Aipperspach, Hooker, and Woodruff's companion publications on The Heterogeneous Home (Aipperspach et al., 2007; Aipperspach et al., 2008).

2. While this work exhibits similarities with the design workbooks described by Gaver (Gaver, 2011), it is offered here as an "end product" of a design process rather than a practical design tool or penultimate outcome.

3. 1837 - The Daguerreotype is the first publicly announced photographic process, utilizing light sensitive metal plates to capture single images. **1900** - The Kodak Brownie sells for $1 under the slogan "you press the button, we do the rest", giving rise to amateur photography. **1947** – Polaroid introduces the SX-70 model, a simplified "instant camera" that produces viewable images within seconds. **1969** – The charged-coupled device (CCD) is invented, enabling digital cameras, which find an initial market with photojournalists. **2014** – Smart phones with hi-resolutions cameras have provided a platform for "photo apps" like Instagram.

The oldest surviving photograph: "View from the Window at Le Gras", by Nicéphore Niépce, 1826 or 1827.

(More accurately, a digital photograph of the original pewter plate coated with a naturally occurring asphalt, Bitumen of Judea, that hardens in proportion to its exposure to light.)

Unviewable Digital Images
"Images" that exist as data, but cannot be displayed as images.

Smash Camera
You need to break the camera apart to access the images. [2]

Write-Only Camera
The camera can write image files to digital memory, but they cannot be read, displayed or seen. [1]

Prior Image Camera
Instead of displaying the image just taken, the camera displays a prior image taken. [4]

Time & Place Camera
You can only view the images while at the place or date they were originally taken.

Restricted Viewing
Images that cannot be viewed anytime, anyplace, with a click-of-a-button. [3]

1. Write-Only Camera. An LED would blink with each click of the button to assure the user the image has been written to memory. Still, do the images in fact digitally exist (as bits stored in floating-gate transistors)? Perhaps a skilled user could disassemble the camera and reverse engineer the data to produce visible pixel-based images. Or perhaps the camera has a small numerical display that shows the bitmap data structure one element at a time. With a great deal of time and patience, the numerical data could be converted to an image.

2. Smash Camera. In this variation, the shell is to be constructed of porcelain. The numerical display counts up rather than down each time a photo is taken: 00001, 00002, 00003,… The user must decide when

is the right moment to shatter the camera and retrieve the images (after 10 photos? 100? 1000?). The smash camera references a few familiar objects: disposable film cameras, ceramic piggy banks, and time capsules.

3. Restricted Viewing. Technologies built around themes of serendipity, randomness and reflection may employ restricted viewing. See, for example, Odom et al. on the design of Photobox (Odom et a., 2012).

4. Prior Image Camera. A variation on this concept is a Related Image Camera. Each time you take a photo, the camera displays an image with a similar attribute, e.g., color, composition, tone, etc.
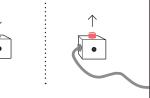
Single-Impression Digital Camera[1]
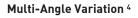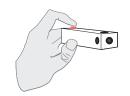You can take only one digital image.[2]

1-Shot Camera [3]
You can only take one image at a time. To take another image, you have to manually download the previously taken image.

Multi-Angle Variation [4]

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1. Single-Impression Digital Camera. The earliest cameras could take only 1 impression at a time. In order to take another photograph you had to manually load a new plate. The long exposure times neceessary for these earliest cameras further required subjects to stand still for extended periods of time (hence the use of pedestals in portrait photography for models to lean against). The introduction of the Kodak Brownie and other cheap, mass market cameras enabled multiple "snapshots" on a single roll of film. Current camera phones continue this trajectory, enabling snapping off hundreds of shots per minute.

In a digital era Henri Cartier-Bresson's "decisive moment"—"the creative fraction of a second when you are taking a picture"—is still an applicable perspective and technique. But why not capture the second before and after, just in case? Why take just one photo when you can take 10 or 100 and then select the best?

2. You can only take one image at a time. The desire for new limits on the practically unrestricted speed, amount and ubiquity of digital photography is suggested in the persistence of Polaroid Cameras (old and new) and Photobooths. (It is also suggested by the photo app Snapchat; see Transient Digital Images, footnote 1, p. 7). Yet taking only one photo because it is a strict, unavoidable limitation is different from

voluntarily refraining from taking more than one photo. Would not the single photo taken out of self-restraint and the one taken within camera-constraint be different photos? Self-imposed constraints are practically and experientially different than those that are technologically-imposed. To what extent is taking just one photo even a possibility today? (And to what extent could it be desirable to do so?)

3. 1-Shot Camera. The 1-Shot Camera proposes to give back the option to only take 1 single photo. It also proposes to give back the possibility of viewing and appreciating an only photo taken. A problem with this proposition is that the resulting "1-Shot" image would not look any different than any other digital image. In contrast, a Polaroid photo visually testifies to its slower, more limited, non-digital form of production. The Polaroid picture announces that it was 1 of but a few (rather than countless) images taken and take-able at a given time and place by a given camera and person holding it.

4. 1 Multi-Angle Shot Camera. This variation tries to entice the user to adopt a 1-shot mentality and practice with a new positive feature. (See also: Peripheral Camera, p. 6).
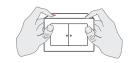
Immutable Digital Images
Digital images that cannot be digitally transferred, copied, or edited.[1]

Restricted Transformation
Limited ability to digitally transfer, copy, or edit.
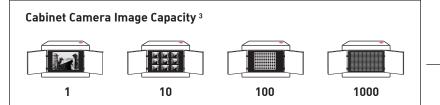
Cabinet Camera
You cannot transfer the photos to another device. You cannot share the photos online. You cannot edit the photos. You cannot delete the photos.
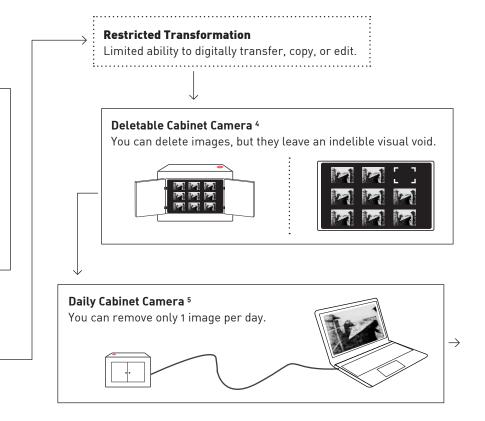
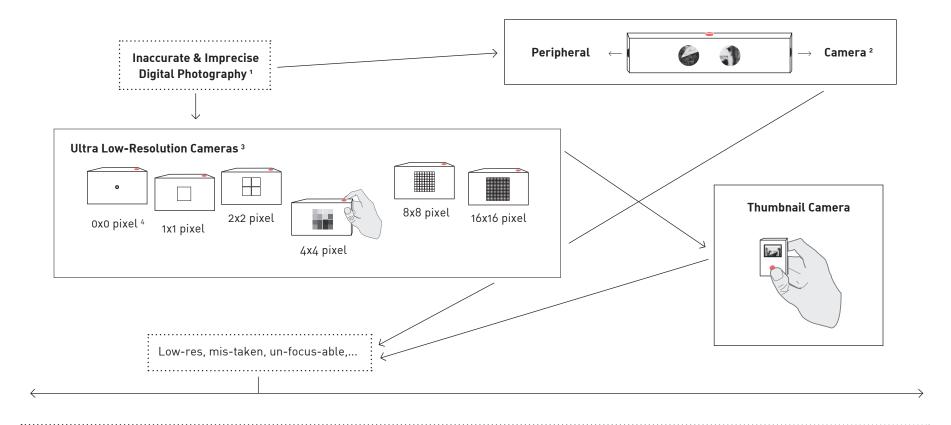You can view and enjoy the photos on the camera display. But the photos live only in the camera and on the display.[2]

Deletable Cabinet Camera [4]
You can delete images, but they leave an indelible visual void.

Cabinet Camera Image Capacity [3]

| 1 | 10 | 100 | 1000 |

Daily Cabinet Camera [5]
You can remove only 1 image per day.

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1. Immutable digital images. New media theorists have located the "newness" of digital media in its basic technical operations: selecting, compositing, copying, sampling, deleting, ctrl-z-ing,… (see, e.g., Lunenfield, 2000; Manvoich, 2001). What if a digital technology restricts these basic, "essential" operations? And in what sense are they truly basic or "essential"?

2. Cabinet Camera. The Cabinet Camera removes the technical options for digital post-production of images, along with the more basic abilities to transfer, copy or delete an image. This restriction recalls the earliest American Daguerrotypes. These cameras produced images without negatives, thus creating a truly unique image. More familiarly, the Cabinet Camera recalls the printed photo album.

3. Cabinet Camera Image Capacity. Image capacity substantialy affects the suggested usage of the device. A capacity of 10 or 100 images suggests reserving the photos for special events. A capacity of 1,000 or

10,000 image suggests capturing more prosaic moments.

4. Deletable Cabinet Camera. Impressions taken on rolls of camera film cannot be deleted prior to being developed. Yet these accidental and poorly composed snapshots can vividly portay a sense of time and place, especially when viewed years later: the corner of a room and some carpet from an old apartment, part of an ex's out-of-focus face, a shaky scene from a party. Such photos are typically deleted or disregarded if taken digitally. Inhibiting deletion could re-enable appreciation for "bad photos".

5. Daily Cabinet Camera. This variation would discourage transfering photos without strictly prohibiting it. This would encourage keeping and viewing photos only on the camera while allowing one to take a photo without worrying that it could never be digitally shared or edited.

Inaccurate & Imprecise Digital Photography [1]

Peripheral ← → **Camera [2]**

Ultra Low-Resolution Cameras [3]

0x0 pixel [4]   1x1 pixel   2x2 pixel   4x4 pixel   8x8 pixel   16x16 pixel

Thumbnail Camera

Low-res, mis-taken, un-focus-able,...

1. Inaccurate and Imprecise Digital Photography. The first cameras originated from a desire to fix the transient image projected onto a plane by the camera obscura. Accurate and precise reproduction was thus an original aim of photography. Yet as media theorists and art photographers remind us, photographs are made, material things. This idea makes sense to anyone that uses Instagram filters, Photoshop, or apps that automatically make you more beatiful by subtly altering your face. Manipulations of this sort don't make the image more accurate or precise, they make the image (and reality) more like we want it to be. Are "abstract" or "pictorialist" photos more or less truthful or revealing than "straight" photographs?

2. Peripheral Camera. Or Up-and-Down if you turn it 90 degrees. (Or Forward-and-Backward.)
See also: 1 Multi-Angle Shot Camera, p. 4.

3. Ultra Low-Resolution Camera. In a world of higher and higher resolution digital images, could low-resolution images be seen as unique and significant? With custom low-resolution displays, low-resolution

digital images can be seen as novel rather than reduced forms. This can be seen in the distinctly low-resolution displays pictured below (see image credits).
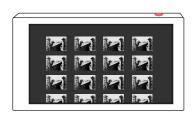

4.0x0 Pixel Camera. See also: Write-Only Camera, p. 3.

Ephemeral Digital Images [1]

Reverse Polaroid Camera

Photos appear instantly but pixelate with each second they are displayed. You can suspend the pixelation at any time by not displaying the image.
You thus have two antithetical options: You can maintain the image when not displaying it; or you can view the image when dissipating it.[2, 3]

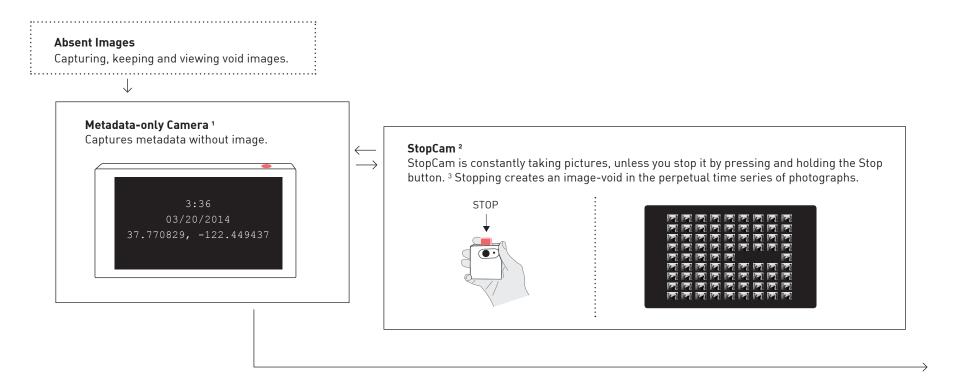| 0 seconds | 5 seconds | 10 seconds | 30 seconds | 45 seconds | 60 seconds |

1. Ephemeral Digital Images. The novel possibilities that lie in transient digital imagery is exemplified by the popular photo app Snapchat. Snapchat allows you to take, annotate and send photos to your friends using your smart phone. Upon receiving a photo you can choose to open and view it. But once you open and display the image it disappears permanently after 1-10 seconds. Snapchat can be seen to function in certain ways as a tele camera obscura device. In practice, it is used for chatting through imagery, as the name suggests. The precise, imposed destruction of the image allows one to send risqué, ridiculous and what might otherwise be uninteresting photos with lessened inhibitions.

2. Reverse Polaroid. The variation depicted has a similar interface to the basic iPhone or Android camera and photo gallery app. Once you take a photo it can be seen as a thumbnail preview in the photo gallery. You can select a thumbnail to view the full-scale image. However, there is tradeoff to displaying and viewing the image: the resolution deteriorates with each second that it is displayed. You can suspend the deterioration by returning to the thumbnail view (the thumbnail resolution updates accordingly). If an image fully deteriorates, you are left with a single color: the pixel-averaged value of the original image. The Reverse Polaroid can be seen as the personal counterpart to the social app Snapchat.

3. Digital dissipation. The Reverse Polaroid foregrounds a unique feature of digital technology: the ability to precisely control the deterioration and destruction of digital media. A photo can be digitally captured and viewed in an instant. Likewise, it can be destroyed with precision, in an instant or over time. Printed photographs have their own ephemerality, but it is of a different sort than digital ephemerality.

Absent Images
Capturing, keeping and viewing void images.

↓

Metadata-only Camera [1]
Captures metadata without image.

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3:36
03/20/2014
37.770829, -122.449437
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StopCam [2]
StopCam is constantly taking pictures, unless you stop it by pressing and holding the Stop button. [3] Stopping creates an image-void in the perpetual time series of photographs.

STOP
↓

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1. Metadata-Only Camera. This camera is related to Matt Richardson's Descriptive Camera. Instead of producing an image, the Descriptive Camera outputs a text description of the image using crowdsourcing.

2. StopCam. StopCam is a propositional counterpoint to Microsoft's SenseCam. SenseCam is a wearable wide-angle lens digital camera that automatically takes pictures (e.g., every 30 seconds). "Originally conceived as a personal 'Black Box' accident recorder, it soon became evident that looking through images previously recorded tends to elicit quite vivid remembering of the original event" (Senscam website).

Yet the fullfillment of the desire to record everything gives rise to counter-desires: refraining, deleting and forgetting recorded imagery. "If everything that existed were continually being photogaphed, every photograph would become meaningless." (Berger, 1980). SenseCam brings us closer to fulfilling this ultimate photographic scenario: of recording everything and rendering everything viewable. While the collection of photos produced by SenseCam are far from meaningless, SenseCam suggests how the absence of a photo could become meaningful, and how we could desire and be able to remember an image of nothing amidst images of everything else. An image-void would be a digital record of there being no photographic record.

3. Stop Button. If everything that existed was continually being photographed, when would you hit the Stop Button to take a photo-void? A trip to the Grand Canyon? A birthday party? A gathering with friends? A private moment? A bout of extreme joy, or pain? At random?

Descriptive Camera™, Matt Richardson   SenseCam. Microsoft Research.

> **Designing Limitations and Counterfunctional Things**

Conclusion

What is one to make of these counterfunctional camera variants? An operational camera, perhaps? Or a photographic image of such a camera? Or perhaps nothing at all, but rather something abstract and conceptual. The schematic character of this work is intended to leave things open to different interpretations, applications or other future developments. As a visual-textual artifact, the intended "use" or "function" can have a productive ambiguity rather than definitive articulation. A few useful directions to consider, however, are verbal concepts, visual proposals, and operational prototypes. (See Appendix.)

The concepts presented here have focused on new ways of seeing, using and designing camera and photo technologies. Yet these camera variants have been designed to also bring into focus a broader perspective: designing digital limitations. Digital technologies are celebrated for their new, exciting possibilities. But if digital technologies can do "anything", perhaps they are limited by their possibilities. Our latent needs and desires for limitations are highlighted by scholars [1], artists and personal anecdote (have you ever felt the urge to turn off your computer, phone, or camera?; did you ever feel a desire for a limited camera when reading this?). Critical issues of social equity and environmental sustainability further bring into focus the importance of not simply working within constraints, but designing and offering limitation as experientially positive and practically enabling features and qualities.

On multiple levels, designers understand the necessity and value of working within constraints. Yet the positive value of limitation is a conceptual design space whose limits have yet to be fully explored →

1. Sources on "limitations". Within HCI see recent writings on busyness and overwork (Leshed & Sengers, 2011), simple living (Sengers, 2011; Håkansson & Sengers, 2013), conflicting cultural discourse surrounding the smart phone (Harmon and Mazmanian, 2013), voluntary non-use and removal of technologies such as email (Mark, Voida, & Cardello, 2012) and Facebook (Baumer et al., 2013), the design of slow technologies (Hallnäs & Redström, 2001; Odom et al., 2013), and non-use and negation as research and design perspectives (Satchell & Dourish, 2009; Baumer & Silberman, 2011; Pierce, 2012).

From areas adjacent to HCI see, for example, writings on the significance of photographs not taken (Steacy, 2012), the value of simple communication tools in an age of communication overload (Harper, 2012), the benefits of deleting and forgetting digital content in an age where Facebook and Google remember everything (Mayer-Schönberger, 2009), the literal and metaphorical lack of sleep amidst a 24/7 culture (Crary, 2013), and the critical and counter functions of design as a catalyst for reflection and debate (DiSalvo, 2013; Dunne & Raby, 2014).

APPENDIX: SUGGESTED USES

IMAGE CAPTIONS AND CREDITS

[p. 2] ˝View from the Window at Le Gras˝, 1826 or 1827, by Joseph Nicéphore Niépce, used under CC BY.

[p. 6] ˝Drive˝, by Jim Campbell, 2005. 15 1/2 x 11 3/4 x 2 1/2 inches. Custom electronics, 192 RGB LEDs, treated Plexiglas. Image courtesy Jim Campbell.

[p. 6] ˝Wooden Mirror˝, by Daniel Rozin, 1999. Pieces of wood, servo motors, control electronics, video camera, computer, wood frame. Image courtesy Bitforms gallery and ITP NYU.

[p. 6] Playskool Showcam™. Image courtesy Michelle Yozzo.

[p. 6] 10x10 Ultra Low-Resolution Display. (See Pierce & Paulos, 2014.) ©James Pierce.

[p. 7] Snapchat photo. Used under CC BY.

[p. 7] Snapchat photo. Used under CC BY.

[p. 8] ˝Descriptive camera™˝, by Matt Richardson, 2012. Image courtesy Matt Richardson.

[p. 8] Microsoft SenseCam. Image courtesy Microsoft Research.

[p. 10] Capsule Camera prototype. (See Pierce & Paulos, 2014.) ©James Pierce.

[p. 1 - 10] All other images /diagrams ©James Pierce.

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