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A Conversation between R. Luke DuBois and Anne Collins Goodyear

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Abstract
The metaphorical relationship between sight and knowledge has long been recognized. The double entendre of “illumination” promises both light and understanding; “I see” signifies that one “gets it” intellectually. This conversation between R. Luke DuBois and Anne Collins Goodyear addresses how data accrues meaning through pictorial structures that represent it. An artist, DuBois has consistently played with conventions for depicting information visually, revealing the intersections between data and desire they represent. Reexamining the interfaces through which we view the world, DuBois and Goodyear consider what our filters threaten to hide.

Résumé
La relation métaphorique entre la vue et la connaissance est bien connue : le double-sens d’« illumination » promet à la fois lumière et compréhension ; « Je vois » signifie que l’on a compris. Cette conversation entre R. Luke DuBois et Anne Collins Goodyear considère comment les données accumulent du sens à travers les structures picturales qui les représentent. Artiste, DuBois joue avec les conventions qui servent à représenter l’information visuellement, révélant les croisements entre les données et les désirs qu’elles représentent. Réexaminant les interfaces à travers lesquelles nous regardons le monde, DuBois et Goodyear réfléchissent sur ce que nos filtres risquent de cacher.

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The metaphorical relationship between sight and knowledge has long been recognized by philosophers and theoreticians. The double entendre of “illumination” promises both light and understanding; “I see” most often signifies that one “gets it” intellectually. In this vein, the particular power of the indexical image has long been recognized. Photography, for example, draws much of its persuasive influence from what we know about its basic mechanics. Historically, photography reflects the action of light upon a sensitized surface. Even now, pictures that appear “photographic” have a special authority in our society, despite abundant reminders about how easily they might be manipulated. Similar power has historically been granted to the fingerprint and now to DNA, suggesting, each in their own way, “scientific” evidence of the presence of specific individuals, and by extension, specific markers of individuals themselves. That said, if such “evidence” is significant, the question of exactly what it might mean is always open to interpretation.

Today, particularly for those who consume news reports actively, another form of imagery has come to connote “truthfulness” or “insight.” This is, of course, the data visualization. Apparently generated indexically by “neutral” algorithms, such graphs, maps, and pie charts partake of visual semantics of mathematics and science, artfully enable us to “see,” that is to understand, the world in particular ways.

Integrating his training in musical composition, engineering, and the visual arts, R. Luke Dubois uses strategies both playful and profound to expose conventions for capturing and displaying information, thereby interrogating how it becomes “knowledge.” In the following conversation, R. Luke DuBois (RLD) and Anne Collins Goodyear (ACG) address how data accrues meaning through the pictorial structures that represent it, shaping our perceptions of ourselves, our society, and our political system. Reexamining the interfaces through which we view the world around us, DuBois and Goodyear consider what our filters threaten to hide.

ACG: Luke, you have made the observation that “Americans’ mental model of their own country is wrong,” in other words, that the very flood of data to which we’re exposed actually distorts our understanding of the world around us.

RLD: Yes, and visualization plays into that. Because a lot of time the people who do visualization are “stats” people. And it’s a combination of math and persuasive design. But it’s not always right. Often things are not as cut and dried as we might think. And it frustrates me. We make a lot of mistakes.

ACG: I think it all depends on what the goals of your statistics are. As you point out, “persuasive design” can help determine the psychological impact of a particular visualization. But although the resulting chart may give every appearance of reflecting reality, its structure may not appropriately describe the facts. And I think what gives data visualization the potential to be so dangerous.

RLD: Yes. That’s true.

ACG: Are these concerns that you’ve tried to manifest explicitly in works like A More Perfect Union (2010-2011; Fig. 1A), in which you effectively created an alternative version of the 2010 census, relabeling towns to reflect how the inhabitants saw themselves—at least as reflected in their personal dating profiles?

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RLD: Yes, I’m always problematizing the public understanding of information science and data visualization a little bit. But that’s not always the point of the piece. From my perspective, *A More Perfect Union* is a lyrical study about how Americans talk about themselves in order to feel loved or in the hope that they might be loved. That’s really where I was coming from. But under the hood, I wanted to grapple with the fact that data visualization is reductive and to figure out how to make something that was more inclusive. So I decided to do an absurdist cartography project where I plotted something like 20,000 different words all over the country from 19 million people [after joining twenty-one different online dating services].

But in order to make the piece I realized that it couldn’t just be the top word. It had to be the most unique word for that locale. This means all the words are different, which means you get more of them. So it’s not: what’s the most popular word? Otherwise, it all would have been “love,” except LA which would have been “sex!” But if you force it to be the most popular word in the region vis-à-vis everybody else, then it’s all based on a series of tiny margin calls and you end up with “waitress” as the name of Portland, Maine (Fig. 1B), and that’s cool. It’s “wrong,” but it’s interesting.

ACG: Could you say more about how something can be “wrong” and yet revelatory? I seem to recall, for example, that Picasso called art “a lie that makes us realize the truth.”

RLD: Sure. By “wrong” I mean words like “waitress” don’t even pretend to accurately represent the entire locale, which is what a census (even a crazy one like mine) strives to do. It’s a statistical fluke that it’s there, whereas “dinosaur” (Syracuse, NY) seems wrong, unless you happen to be from Syracuse and you know that the best restaurant in the city is called “Dinosaur Barbeque.” So “dinosaur” in this case is “right.” Or it could just be a sensibility. “Now” feels “right” for New York City. So I think your point about revelatory is correct... and the Picasso quote stands.

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Every time I show or discuss *A Perfect Union* somebody asks me why I didn’t just make the whole thing up. I suppose I could have done that, in other words, just thrown a dictionary full of random words on a map and moved them around until I thought it looked cool. And I always explain that it would have been such an insane amount of work to do it that way and that I wouldn’t even have known where to start. But that doesn’t mean that what I ended up with is the “truth,” simply because it’s based on statistics, either.

It’s the same thing with my *Self-Portrait, 1993-2014* (2014; Figs. 2A and 2B), which is all about showing my tangled web of interpersonal connections. If I were making that map from memory, it would not look like that. This shows who my computer thinks are the most important people in my life, according to the rules of the game that I set up somewhat arbitrarily pretending that I was an investigator in the Justice Department. I channeled my inner G-Man and imagined that I was investigating R. Luke DuBois for fraud and that I was trying to figure out his known associates. So I said to myself: “I would run his email through an algorithm that shows who he carbon copied on how much for how long and how professional or unprofessional the discourse. That would weed out all the girlfriends from the co-workers and would weed out all the people he’s known a long time from those who he only knows a little bit.”

ACG: In a weird way do you think this is like psychoanalysis, like Freudian psychoanalysis? In other words, does the data analysis tease out the “Freudian slips” that we would not otherwise notice?

RLD: Yes. One of the things I did to cut out the “noise” in the piece was to drop all the people with whom there wasn’t a full two-way correspondence. So in order to get into my map you had to write me and I had to write you back and you had to acknowledge the response in one thread. So that gets rid of Spam. It also gets rid of “quickies,” such as when someone needed a quick piece of information. But a woman with whom I had had a relationship saw the piece and became really upset because she was missing from the map. She said: “You erased me from your life.” I said: “That’s impossible: you must be in there.” So I looked and then I realized what had happened: we had had a couple “lost weekends” …

ACG: So you weren’t on email about it …

RLD: We had almost no email, and they were all individual threads. They weren’t lumped together as one conversation. So the algorithm didn’t detect it. So she got cut. So I thought, “well that’s a bug.” I wonder who else got cut. None of these things is neutral and none of these things work.

ACG: Exactly. Do you still use email a lot?

RLD: Yeah, I have to use email because of work. We generate a lot of email. It’s a problem. I don’t like texting. I don’t like having to stop and look at my phone. But my girlfriend loves to send text messages.
ACG: If you wanted, could you do a database of all of your texts?

RLD: Yes, I could do it with my texts or my voice mails. Get my voice mails transcribed. But I liked doing the email because I wanted this self-portrait subtly weighted toward my younger self and specifically my college years. College is that phase where you burn through a lot of people really fast, and I was in college when email started. The novelty of emailing has declined. In college, that's how I stayed in touch with all my friends from high school. I wrote people letters like every day.

ACG: So in a way, you're saying even the communication formats we use—our methods of sharing information—both reveal and determine something about us that should be taken into account when we begin to analyze the networks of connectedness they seem to reveal. So as we begin to think about the ways in which we communicate,

maybe it's also worth thinking about how the technologies we use impact our very thinking, indeed the choices we make.

Along these lines, you recently installed an exhibition of new work, *The Choice is Yours*, which looks at the history of voting.

RLD: My favorite part of the show is not about the art. I wanted to do something that wasn't about any specific election. I wanted to make one about the mechanics of it. What does it mean to choose things and how do we choose things?

I started this project [in the spring of 2016]. These old voting machines are easily findable on eBay. They're interesting mechanisms. They're kind of beautiful. And in the show I have four little machines and one large one. And you know how they work. You've voted on these before.

ACG: I'm not sure. I think I voted in every election since I was 18, but I don't recall the technology. It's

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interesting to think about how visualization—through the design of voting machines themselves—affects democracy. So it’s unnerving to realize that I don’t even remember the nature of the machines on which I voted! The technology was, and remains, quite literally “invisible” to me.

RLD: The way it works is that little pointers let you vote, and a lever that registers your vote by flipping down shims on the back that then activate the counter. To ensure security, these things were in a box. You had to pry open the box like a can of tuna after voting occurred. But what I’ve done is to extrude the mechanisms. In order to detect these switches, I have a camera looking at the back, so I’ve got fluorescent day-glow purple, orange, and sky-blue nail polish marking the dials on the reverse all over the show. That’s what the computer is looking at to determine the votes.

ACG: Why nail polish?

RLD: Because it sticks to metal and is bright and is cheap.

ACG: You know what I also think is kind of interesting about nail polish? It tends to be gendered female, which sounds like something of a nod to women as the original “computers.”

RLD: Yes, women were “computers.”

ACG: Could you say a little more about the nature of your “computers”?

RLD: I’ve modified all these voting machines to be about voting for different things. And the four categories here are kind of abstract. There’s one about images, one about sound, one about language, and one about symbols.

ACG: What inspired those categories?

RLD: They all have to do with machine learning. The moment at which these voting machines were built in the 1960s coincides with the time when computer science as a discipline coalesced.

In 1956 Dartmouth hosted the world’s first artificial intelligence conference. The manifestos that came out of that event were very aspirational. The participants believed that if a computer could be instructed to take into account all elements needed to make a decision it could then make choices for us that would be uncolored by bias and perfectly moral and ethical. It was this beautiful piece of idealism: eventually a computer could tell us when our hard-boiled eggs were ready and it could also stop a war. In theory, the thinking went, if you fed it everything it needed to know, the computer could make better decisions about war and peace than the President.

ACG: In theory they thought the computer could do that because it would be divorced from the sorts of prejudices that we perceive go along with emotion and skin color and so forth?

RLD: Exactly. They were thinking in this very beautiful space. But if you fast forward to 2016, the year in which I conceived and executed this show, you realize that we have a lot of problems that are related to artificial intelligence. And a lot of the founding fathers of the field of artificial intelligence died this past year, including Marvin Minsky and Seymour Papert. So this show is an homage but also a backhanded critique of how these people thought.

ACG: You describe The Choice is Yours as both an homage and a critique of “machine learning.” Could you elaborate more on the nature of the homage and the critique? Does this tie in some particular way with democracy and the practice of “voting” or the choices we make?

RLD: The pieces in the show are all feeding user choices into simple machine learning algorithms that work with media. They’re tuned to primarily pay attention to what the current user “chooses,” but they also have an echo of past choices as well.

The homage is around the machines and the algorithms I’m using in them. All date from the mid-twentieth century – the “dawn,” if you will, of...
modern computer science and research into artificial intelligence. I like the idea that the voting machines used in the show might have been touched by people who were working on giant mainframes in the '50s, using an analog counting machine for democracy while using digital logic to replace it someday.

The “critique” is that the machine learns only as well as you train it. So by setting up unusual, reductive, absurd, lyrical choices as inputs into the machines, you get usual, reductive, absurd, lyrical results, the utility of which is questionable. But it’s interesting and I think that as a creative or artistic endeavor there’s a lot of rich metaphor to be mined there.

These are called “learning machines” instead of “voting machines.” It’s a play on “machine learning.” Learning Machine #2: Image (2016), for example, works by letting you consider your options and then decide something like: “I want blue stuff about war involving people and it’s desolate and I want hands and water and I want things that are looking up and I want mouths and I want it to be open, and I want nature.” And then you can also choose whether you want the images to be fast or slow or dark or bright or whatever.

And then you vote and the computer recognizes how you voted and you get your own personal one-off, one-minute montage of images that satisfy these criteria. It’s generative, so it’s always different, even if you cast the same vote. And these images come from a 9 million image data set that Google curated off of Instagram and Flickr. They are labeled with data—such as what’s in this scene?—to be used for machine learning.

ACG: So when you say it’s “faux,” what do you mean by that?

RLD: It’s not really machine learning. But Markov chains are used as way to create probability structures that make human-sounding text or human-sounding sequences.

ACG: So it matters that this is an adverb ...

RLD: Yeah, it knows some of that stuff, but it’s actually much simpler than that. All it really does is that it says somewhere in some of these books, this or that—this sequence of words—already happened. So every pair of words overlapping be used to help them train their algorithms and do research.

Learning Machine #4: Language (2016; Fig. 3) is the same thing but with words. When you do machine learning on text you use Project Gutenberg. It’s a big open-source archive of out-of-copyright texts. So you can choose and can say like, “I want to see a hybrid of Pride and Prejudice and Sleepy Hollow and Dracula” and what it will do is it will take those texts and mash them up and make this kind of concrete poetry. It uses a Markov chain, which is like a faux machine learning that’s used to make things sound like they make sense. So it makes this kind of ridiculous poetry... It’s fun.
stood in the original texts. So by stitching them randomly together you get something that sort of sounds like language. But to me it always sounds like a William Burroughs/Brion Gysin cut-up. If Burroughs had been a hacker, that’s probably what he would have used.

So there are categories: “Love” and “Lust.” So you have Jane Austen or Henry Miller. You have *Wizard of Oz* or *Heart of Darkness*. You have *Treasure Island* or *Sleepy Hollow*. You’ve got the *Odyssey*, but then you’ve got James Joyce’s *Ulysses*. You’ve got *Frankenstein* and *Dracula*.

**ACG:** Was there a method to choosing these books?

**RLD:** I just chose them because I thought they were cool. There are a million books in Project Gutenberg.

**ACG:** They are very iconic.

**RLD:** *Learning Machine #5: Symbols* (2016) grows out of my dissertation, which was about how to use grammar models—generative grammars, like Chomsky grammars—for music composition. In the early 1970s, Seymour Papert invented a programming language called Logo. It was about teaching students to program a computer by letting them learn to draw. Sometimes people refer to it as Turtle graphics because the metaphor was “you’re a magic turtle, and you can draw.” This is a Turtle graphic machine. And all these symbols are the code. And the Turtle graphics system had an engine that was based on Chomskian grammars. “F” means “move forward”; “minus” means “turn right”; “plus” means “turn left.” They all mean things in the graphics. It’s super abstract, and you’re not necessarily supposed to understand what’s going on. But you vote and it will draw and make patterns for you. And it also makes music.

*Learning Machine #1: Values* (2016; Fig. 4) incorporates an apparatus from the 1940s. But we were using them up until 2004. It’s quite ingenious. The whole thing collapses into one box—the curtain and everything. This is way it works: you pull the lever to the right; the curtain closes; then you vote. Just like these other ones it uses different categories, only the words used here are the characteristics in a Myers-Briggs test. So you can say I want someone who’s delightful and independent and alert and ecstatic and knowing and then you vote. So based on what you choose the machine whips up all that material into ever-running montage of images and text using Instagram and *The New York Times*. There’s a weird side-effect: the more votes you cast, the more results you get from Instagram, but with *The New York Times* the more likely it is that you’ll end up with an obituary! That’s the only time you’ll get all those adjectives. You’ll never get them in a standard news article.

These voting machines are so weird! I love them. I got the large one [for *Learning Machine #1: Values*] at a government warehouse. Six hundred pounds of democracy; they charged me three hundred bucks.

**ACG:** Who says you can’t put a price on democracy! Could you tell me more about *The Choice Is Yours: Exit Poll* (2016; Fig. 5) and the way in which visualization functions within it as a carrier of meaning? How are you using red and blue?

**RLD:** Originally the blue was the incumbent party and red was the opposing party. So if you look at broadcasts from the 1980s and the ’90s, that’s how they coded it. In 2000, when the results of the election hinged on the vote in Florida, the Democrats were blue, and it entered the rhetoric. So that’s why, counter to all European symbolism, American political conservatives are “red,” rather than revolutionaries. It got locked in through a user interface at a time the Democrats were the incumbents.

**ACG:** Fascinating! It had to do with the way in which the election was being visualized. Is there any particular rationale for what questions/topics got assigned red and blue in your *Exit Poll*?

**RLD:** Yes, but it’s not something I over-determined. I think I made the top row of switches on the machines, whatever they stand for, blue, and the lower row, red. That would have been house
style for an election up until 2000, where blue signified the incumbent party and red the opposition. Now that red and blue are locked to specific parties, this stuff switches around when the Republicans control the White House.

ACG: In *The Choice is Yours*, you tie the notion of “voting” to the emergence of artificial intelligence. Are you ultimately suggesting that there’s a playback loop in terms of the assumptions embedded in artificial intelligence, the way in which artificial intelligence is “crowdsourced” today through our uploading of data to the internet, and the democratic society that we are likely to occupy in the future or, perhaps, that we already do?

RLD: Artificial intelligence or, more precisely, machine learning (the flavor of artificial intelligence that is currently dominating the industry) is amazing. A computer can recognize thousands of objects in a video you upload; it can help you find a song based on you whistling a couple of notes off key into your phone; it can help you tag your friends on Facebook; it can help a radiologist analyze a brain scan for cancer. In order to do any of these things, you first have to train the computer on what to look for, listen for, pay attention to, and so on. One way to do this is to provide a large body of exemplar data that illustrates the distinctions you’re trying to prompt the computer to recognize. This is called establishing “ground truth.” Companies are beginning to realize one of the most effective ways...
to do this is to leverage the data made available through the web 2.0 social media / sharing sites and apps that engage in some way with the quantified self, such as Fitbits, geolocation tracking on the phone, and so forth. It’s no accident that Google and Facebook are thought leaders in machine learning. They also own huge media and social media sharing services such as YouTube, Gmail, and Instagram. They can trawl through our data to learn more about us simply by analyzing our behavior. Our votes (in the sense of how we behave online) are very much training these machines, which are then dictating, to some degree, the vision of society that is delivered to us online.

ACG: Your own analysis of data owes a great deal to your study of music. Could you speak further to how your work integrates musical methodologies into the realm of the visual?

RLD: Yes, music is all about algorithms. Deploying data and algorithms for aesthetic impact is a very old technique. It shows up most prominently in music, but also architecture, design, dance. Anywhere that you can get away with a modicum of abstraction in your form. If you know what to look for, it’s all over the place, in every time period, in every culture. And I think "data visualization" has been insufficiently linked to that history and lineage. By the same token, the art forms that best leverage abstraction aren’t living up to their potential in confronting and making sense of our “century of data” by bringing their sensibilities to the table as well. So I think there’s a lot of work to be done. There’s also a way in which visualization is fetishized. That does a disservice because it ends up being overused, sometimes gratuitously, but also sometimes inappropriately, as, for example,
when you have bar graphs instead of photographs in discussions of the human cost of conflict.

ACG: Your work in portraiture—which often depicts public figures who are largely known to us through the data they produce, such as Google co-founders Sergey Brin and Larry Page, pop music icon Britney Spears, and political activist DeRay Mckesson—provides an important complement to other forms of “visualization” you have developed. You’ve had a chance to publish information about your depictions of the “Google guys” and Britney Spears. Could you comment on your recently completed 32 Questions for DeRay Mckesson (2016; Fig. 6)? I love the fact that you were able to integrate an interview with him that was based on questions that had been crowdsourced from students at Bowdoin College, where he was an undergraduate.

RLD: The Mckesson portrait is something that I’m quite proud of because it explores a few strategies to keep a portrait relevant and current, but also to engage with a subject through multiple mediums at the same time. Mckesson’s words in his videotaped interview index his ongoing Twitter activity. That means that he is, even now, contributing to a real-time gloss on his own portrait as it plays on a screen in a gallery. I’d like to do more projects like that, where there’s a rift in the space-time continuum that allows the subject (or the subject’s topic of discussion) to keep contributing to the material being gathered through the ages, long after I’ve stopped working.

ACG: In the context of your recent projects, many of which have touched on aspects of the democratic process, I can’t help but think of another figure you have portrayed: President Thomas Jefferson, who was included in your Hindsight is Always 20/20 (2008). In 1805, Jefferson observed: "Convinced that the people are the only safe depositories of their own liberty, and that they are not safe unless enlightened to a certain degree, I have looked on..."
our present state of liberty as a short-lived possession unless the mass of the people could be informed to a certain degree.\(^8\) Is that relevant to *The Choice Is Yours* and perhaps also to your work more broadly?

RLD: In the sense that education and literacy in this space is very important, yes. One thing that I’ve noticed about my work is that I tend to focus on subjects that I think the average American knows less about or pays less attention to than I think they should. This goes for underrepresented cultural communities, the language used by our politicians, how we describe each other in dating sites, what it means to vote, etc. It’s also why Larry Page and Sergey Brin, Britney Spears, and DeRay Mckesson can all teach us important lessons about society in the twenty-first century in their own way. In 2017, possession of authentic, accurate, and unbiased information is no longer something to be taken for granted, so having the literacy to filter things and to pay attention to what matters is an incredibly important tool that everyone needs to start learning to use. Otherwise we’re in big trouble.

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