I'm here to talk about the Truth Continuum in Visualization. I am Alberto Cairo, Knight Chair in Visual Journalism at the University of Miami. Ask Me Anything!

AlbertoCairo [1] and r/Science AMAs[1]

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Abstract

Hi everyone! This is Alberto Cairo. I teach visualization and infographics at the University of Miami. Actually, I have an awkwardly long title: "Knight Chair in Visual Journalism at the University of Miami, and director of the visualization program at UM's Center for Computational Science." Try to read that without catching your breath! I've written "The Functional Art: An Introduction to Information Graphics and Visualization" (2012) and will publish "The Truthful Art: Data, Charts, and Maps for Communication" in March 2016. I am a journalist by training and have been an employee of several media organizations in Spain, Brazil, and the U.S. I also work as a consultant. You can follow me on Twitter at @albertocairo and read more about me and my work at TheFunctionalArt.com. I'm here today to talk with you about honesty and integrity in infographics and data visualization, but you can ask me about anything, including topics that aren't related to graphics. For instance, my first book was not about visualization, but a collaborative essay about the best Science Fiction novels of all time. And my most widely read piece of writing doesn't deal with visualization, either. It's the prologue that I wrote for the Spanish edition of the third volume of George R.R. Martin's Game of Thrones series, 'A Storm of Swords' (really, if you drop by Spain, get the book and you'll see my name in the first few pages!) Here's proof that it's me.

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ALBERTOCAIRO R/SCIENCE

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How would you combat the increasingly rampant practice of deceptive data visualization in order to advance a particular stance on a controversial topic? It seems like more and more visualizations have out of proportion perspective, poor underlying statistics, or some other deficiency that is specifically designed to fool the masses into believing something.

unintentional_jerk
By calling people out. Whenever you see a deceptive visualization, don't just get outraged on Twitter and say so. Write a short blog post about it, and about how to make it better. Then, promote that post heavily in social media. The more of us who do this, the more other people will learn to detect deceptive visualizations themselves. It's a collective responsibility, I believe.

Also, don't focus just on bad visualizations. When you see great ones, highlight them, praise them, and explain why they are great.

Hi Alberto I'd like to know what is your advice to those who insist doing 3d pie charts. I try to explain to them in my classes, show lots of examples, but one week later some of them send me a spreadsheet with a beautiful coloured 3d pie chart. Fabio (from Brazil)

FabioVianna

It's a lost battle, but I am a fan of Steven Pressfield's "Gates of Fire" (about the battle of Thermopylae,) so I also believe that if the cause is just, getting involved in a lost battle is a moral duty.

Jokes aside, as I mention above, I trust people's capacity for reason. If you show people a 3d chart next to a non-3d chart they can't fail to see why one is better than the other. If they then refuse to accept the evidence --it happens-- then there's nothing you can do. It's like trying to convince Ben Carson that the Earth is not 6,000-year old, or to convince an anti-vaxxer that vaccines don't cause autism. No matter how much evidence you throw at people like that, they will remain unconvinced. But they are a minority.

Hi Alberto! In the rush to visualize everything, it seems like many businesses are cranking out interactive dashboards, visuals, etc. that have a lot of immediate visual appeal but have no value for analysis or decision making. When working on projects, how do you determine whether you're satisfying the need for analytical value without disappointing the people who want pretty pictures?

krayh
Hi Krayh. I know that the answer will sound obvious, but I'd suggest: Test your graphics!

I do this even informally. When I do a chart, I show it to people who I believe may be representative of the audience I want to inform, I let them read it, and then I ask them specific questions about what they learned. That very simple, non-scientific exercise can teach you a lot.

Can you remember a time where the use of statistics dramatically changed your opinion on something? A scenario where the stats disproved many of your preconceived notions about a topic?

rhiever
Yes: Books like “The Better Angels of Our Nature”, by Stephen Pinker, “War Before Civilization”, by Lawrence Keeley, and “Noble Savages”, by Napoleon Chagnon (all of them using data somehow) changed the way I see the present times. I used to be a pessimist. Now I am a very, very cautious optimist about humanity’s capacity to improve and become more moral and humane.

What is your favorite statistical anomaly?

rhiever
Hi Rhiever. I am not a statistician (I wish I were!) so I don't know if you're referring to a specific meaning of the word "anomaly". I am in love with examples of mixed effects and Simpson's Paradox, though. A great recent paper about this has me fascinated:

http://static.googleusercontent.com/media/research.google.com/en//pubs/archive/42901.pdf

Hi Alberto - do you think it's best to have a background in journalism or data, or is it possible to combine both to be a really good "data journalist"? If so I'm interested to know what resources or courses you could recommend for such a role.

kusasi2000
It is possible to combine both, as the good folks at ProPublica's "Nerd" team show every day. Check their work here: https://www.propublica.org/nerds

They are all journalists AND designers AND developers AND data analysts. But not all of them are super-experts on all that. Each of them has a deeper knowledge on one or two of those areas. Today, data journalism is better done in most cases in teams.

As for courses, I'd begin with Coursera's Data Science specialization. Books? There are many. My favorite statistics books are listed in this slide:

https://www.dropbox.com/s/j6dlrvfmw33mqe8/Week2_statsRecommendations.pdf?dl=0

Those are some of the books I used myself to learn. They are organized from simpler to geekier. Those are the ones I recommend to my students at the University of Miami.

Hi Alberto. Thank you for the AMA! Infographics are an excellent and important tool to make complex scientific facts comprehensible. But creating infographics is always a process of simplification. So what's your advice to keep the integrity of the facts in the process of simplification?

hagakure-m
Simplification is a very, VERY dangerous word. People tend to equate simplicity with reduction, and that's a mistake.

We should all remember John Maeda's dictum in his book "The Laws of Simplicity", and that I'm quoting in several chapters of my 2016 book "The Truthful Art": "Simplicity is about subtracting the obvious and adding the meaningful".

In other words, simplification is, in part, about reduction. But it can also be about increasing the amount of information you show.

Imagine, for instance, that you do a super simple infographic and you only report the mean of several distributions. That's only appropriate if all scores in the distribution are clustered around the mean. If they are not (if you have many extreme scores on both ends of the distribution, or if the distribution is multi-modal, etc.) you need to show people a histogram.

I am copying a few lines from my new book related to this:

"To understand the notion of resistant statistics, imagine that you're analyzing the historical starting salaries of people graduating from the University of North Carolina at Chapel Hill. You calculate the mean of all students, and you discover that geography alumni make a whopping average of nearly $740,000 a year. Now, that's interesting!"

"But it'd be hardly a surprise if you knew that Michael Jordan, the basketball player, was a geography major at UNC decades ago. His initial salary was probably in the millions of dollars, compared to the few thousands that his peers probably made. !at distorts the mean. Michael Jordan's salary is an outlier, a value that is so far from the norm—the level of our distribution—that it may twist our understanding of the data if we aren't careful enough."

Hi Alberto! I am currently a graduate student in biostatistics with a huge interest in data visualization, your twitter presence has been a big influence and resource for me. Thank you!

My question is: in data visualization there seems to be an equilibrium that must be found. On one hand no nonsense as-clear-as-possible visualizations are very important to getting the data across, but on the other, sometimes the loss of immediate intuition caused by injecting some artistic beauty is overshadowed by increased user engagement. See the generation effect. What is your opinion on how to find this balance or do you view them as two separate camps (i.e. data charts and data art)?

nstrayer93
Thanks, nstrayer93. I always feel very nervous when receiving praise from statisticians and scientists. As a journalist, and even if I love (love) reading and learning about stats, I feel that I will always be an

amateur compared to you guys.

Your question is one of the hardest ones to receive in a workshop. In classes and in my new book I explain that I think that great visualizations should be truthful, functional, beautiful, insightful, and enlightening. There's a hierarchy in those values.

Truthful is the most important one: Making sure that we're handling data correctly, that we are not being misled by it, and trying to avoid misunderstandings on the part of the reader.

By "functional" I mean designing our graphics with cognition in mind: Some graphic forms are better for accurate estimations (charts that have common straight axes) and others are better at giving you the big picture of a data set (shades of color, area, etc.)

Only after those that we should focus on making our graphics more "engaging". This is very important, of course (it is not true that "beauty takes care of itself", I believe,) but the first two values are paramount.

Hi Alberto,

I'm a journalist at a major media company in Australia and one of the things we're all receiving training in now is data journalism. I often create maps and interactive stories for our readers. I find a lot of data charts are boring - either in presentation or in execution.

Just three questions: 1) What qualities make a chart/map etc. engaging and able to retain attention?

2) Could you clarify integrity in infographs, if you haven't done so already.

3) What are the best starter tips for people looking to go into data journalism?

Thanks.

lowen90
I tend to side with Tufte on this: If your data is boring, it's probably because you're showing the wrong data. Charts, maps, graphs, etc., need to be engaging because of their content, first and foremost.

That said, there are ways of making our graphics more attractive, fun, and engaging. Think of The Economist, for instance. Their headlines are usually a joke, a little pun. Also, trying to create charts that are a bit unusual (but always remembering that clarity is a must) can help. Finally, a bit of unobtrusive decoration might be appropriate, depending on the publication. See this discussion about it:

http://www.thefunctionalart.com/2015/09/stephen-few-asked-me-what-i-thoughts.html

Integrity in infographics... That's a long story. I am writing a whole book about it! But it all comes down to this: Show the right amount of data. Not the amount of data you believe your readers can understand (we journalists tend to believe that people are stupid, and they aren't), and not the amount of data that you're interested in showing. The "right" amount of data means the amount of data that tells the story clearly, truthfully, and with adequate depth.

As for tips to get started into data journalism: Read a lot about stats and quantitative reasoning (see answer above in which I recommended some books,) learn some coding, and become a good journalist and designer.

Hi Alberto, my question is about color-blindness. I know there have been studies about the co-interpretation of color and data, and of course using color to interpret data is essential. How do you think about the limitations of working within a colorblind friendly palette, and to follow up,

do you think that colorblind palettes can be as effective to a general readership as a non-colorblind palette?

The impetus for this question is that I work with a surprising number of colorblind folks, but also work in a field that has a somewhat "standardized" scheme of color for interpretation which is extremely colorblind unfriendly. To be clear, I am a computational chemist and the conventions for atom coloring and electrostatic coloring are long established, and utterly terrible for people with any sort of color deficiency. This leads to a rather ungraceful balancing act between tuning colors so that all are differentiable, while avoiding miscommunication between scientists.

geirrseach
Thanks, Geirrseach. I work with scientists on a regular basis, and it still puzzles me that they like things such as the rainbow color scheme, which as been shown to be very inefficient and misleading.

As I mentioned about, I believe in the power of polite reasoning to convince people out of their cherished notions an ideas. Instead of writing a long treaty about color, I'd recommend that you borrow some lines from Colin Ware's "Information Visualization", Terry Slocum's "Thematic Cartography and Visualization" and from these papers and articles:

http://vgc.poly.edu/~jpocom/pubs/exploratoryStudy2015.pdf

http://earthobservatory.nasa.gov/blogs/elegantfigures/2013/08/05/subtleties-of-color-part-1-of-6/

https://eagereyes.org/basics/rainbow-color-map

Hello Alberto! What's your opinion on Tufte's minimalist perspective? Do you feel it's outdated, or does it still have its place in certain areas?

gershan
It's a good idea for some specific domains, and as general rule for any other: "Everything should be as simple as possible, but not simpler," and all that. But, as everything, it needs to be put in context and -- pardon me for the cliché-- taken with a grain of salt.

Taken to the extreme, ideas like this can become dogmas (and they have, among certain folks.) I profoundly dislike dogmas and arguments from authority, and it puzzles me that some readers tend to see people who write about visualization as gurus. That's wrong. Our books and articles reflect our best current understanding of the field, but we may be proven wrong in the future. I talk about this a bit at the end of this article:

http://www.peachpit.com/articles/article.aspx?p=2048358

The University of Miami is my dream school! I'm applying this fall :))

FishesNBitches
Oh, that's great to hear! Please DO contact me to talk a bit, particularly if you have questions about our programs: alberto DOT cairo AT gmail DOT com

Who has greatly influenced your workflow/process? And how?

sfall
At the beginning of my career, John Grimwade (http://johngrimwade.com/). I learned to sketch things out ALWAYS before going to the computer, to pay attention to detail, and to do graphics that aren't just clear and accurate, but also elegant and nice-looking. Today, I am a serial borrower. I get inspired by

everyone I meet in this field!

Which are the top 3 must-read books für infographic beginners and which are the top 3 for professionals?

hagakure-m
I'd say Isabel Meirelles "Design for Information", Stephen Few's "Show me the Numbers", and Terry Slocum's "Thematic Cartography and Visualization". To begin with. More a more comprehensive reading list, see:

http://www.thefunctionalart.com/2012/06/information-graphics-and-visualization.html

Hi Alberto! In your opinion what's the best way to push an organization to employ a fact based management system instead of acting on feeling driven impulses?

cacahuate_
Well, I'm not an expert on this, but based on experiences in the news industry, my strategy is to always show things side by side, after getting the results, for people to see the evidence of the success of one approach versus the other. I know that this is kinda of a no-brainer, but it has really worked for me in the past. I have trust in people's capacity to reason.

Hi Alberto! Much thanks for doing this AMA! What design principles do you wish were better understood for visualization?

tungs
Thanks, *tungs*. Not principles per se, but I'd like to see a better understanding of typography. Color has been explored by experts quite a lot (Colin Ware and Rob Simmon come to mind: http://earthobservatory.nasa.gov/blogs/elegantfigures/2013/08/05/subtleties-of-color-part-1-of-6/) but not the use of fonts. This includes myself, by the way. I have a very shallow understanding of typography. It's one of the areas I want to learn more about in the future

Seeing as more and more consumers of data and graphics are moving onto mobile devices with limited real estate and different interaction methods, how do you think this will affect data visualization as a practice?

Right now this seems like the elephant in the room that nobody wants to talk about partially since it's damn hard I guess :)

mindspank
Oh, yes. And it's not an elephant. It's a f#ck!ng SHARKNADO! (pardon my French.)

I don't have defined thoughts about this yet, but I'm working on it. To begin with, mobile forces us to show less information on each step, so we need to find away to keep the integrity of the information we're presenting while, at the same time, not forcing people to slide or click 100 times. The folks at NPR news development team are worth following for ideas about this topic. That's what I do, at least.

What's one of your favorite memories of the early days of creating interactive visualizations on the web? And what is the best Science Fiction novel of all time?

tungs
Oh, I used Flash in those early days, and it was so, so much fun to be able to do extremely sophisticated things with very little code involved. I miss those days, although I'm seeing new tools

appearing here and there that will help us a lot, I think. The latest ones that got me excited are www.quadrigram.com and the ones I mention here:

http://www.thefunctionalart.com/2015/08/new-articles-and-tutorials.html

As for the best Science Fiction novel of all time, it's Stanislaw Lem's "Solaris".

I am also a big fan of all Robert Silverberg's novels from the 70s, such as "Dying Inside" and "Downward to the Earth", among many others. This man deserves to be known by the great public. I hope that a smart editor will collect all his great works in a single hard cover collection, in a similar way it's being done with Philip Roth recently.

I also have a special place in my heart for Dan Simmons' "Hyperion".

When learning about data viz in school, we were heavily influenced by Tufte's principles of visual integrity. On the topic of lying with data, he points to the 1970s as being the peak of untruthful data storytelling, with distorted figures, poor data-ink ratios, usage of glyphs that scale area instead of just height, etc.

We've clearly grown-up beyond those dark ages, but dishonesty with data still obviously happens. In your opinion, what is the biggest trend or habit in current data viz that leads to lying with data (intentionally or unintentionally)?

dekrant
I don't think that we all have grown-up, unfortunately. The Internet has opened the flood gates for both many more fantastic visualizations and for many more misleading ones.

The biggest problem in visualization nowadays, in my opinion, particularly in news visualization, is not a problem with the graphics per se, but with the reasoning behind them. We journalists and designers are very ignorant of elementary principles of quantitative and logical reasoning. I include myself in there. The stuff I've learned in the past 5-7 years has helped me understand why many (many) of the charts I did a decade ago are basically crap. And I keep learning, so I am sure that 5 years from now I'll feel uneasy about some of the things I am doing today!

In the Epilogue of my new book, by the way, I joke that I wrote it with a very specific reader in mind: Myself ten years ago.

Alberto, I hope you're still online, answering questions, as I have a few!

1) I know you're more into data visualization, but how do you see the role of Big Data (specifially in mass data collection by any number of groups, corps, or govs, involuntary or not) in shaping how the public thinks of themselves and of themselves in relation to the world around them? How does "journalist responsibility" in speaking truth to power factor in to the Big Data debate?

2) There's been much written about how facts don't necessarily change opinions, espcially when those opinions are rooted in (or given cause to root in) emotion. Have you found any particularly successful ways of subverting that trend?

3) R+L=J, yes or no?

Thanks!

nathanielray
I will be in and out until 2PM today!

I don't have any surprising ideas about "Big Data" (whatever that means, by the way) other than it excites me and terrifies me at the same time. On one hand, collecting massive amounts of data about ourselves can help us challenge preconceived wrong ideas, which is great and wonderful. On the other hand, as books like "Data and Goliath" or "To Save Everything, Click Here" show, the potential for misuse is enormous.

Some studies have shown that most people use data not to challenge themselves, but to strengthen their own ideas. This is called the confirmation bias. However, there are ways to overcome this, I believe. Critical thinking can and should be taught at all levels of education. I am not talking about the leftist dogma some of were forced to endure in journalism school (useless stuff about the School of Frankfurt and the like), but scientific reasoning, elementary statistics, and logic.

There's a famous quote about this: "You cannot reason someone out of something he or she was not reasoned into." This is certainly true in the short term, but NOT in the long term. Here's what I mean: It's impossible, as I wrote about, to convince an anti-vaxxer that she's wrong by using just evidence. But you don't need to convince her. You need to convince the people around her. Once you do that, her misguided opinion becomes irrelevant, and it'll be more likely that she will start experiencing doubts herself, just because of peer pressure.

I will hold judgment about Jon Snow (not the guy who did the famous Cholera map, but the troubled chap living in the frozen wall)

Hi, Alberto. Thanks for doing this and representing the craft. As you know, truth and clarity are precious commodities in our line of work. Just as we don't want writers making things up or photojournalists over-editing news photos, news graphics shouldn't play fast and loose with visuals where numbers are concerned. While we're trained to spot such things, we can't expect the average reader to know why that non-zero-based fever on avg. NYC apartment rent is misleading. Should we be doing more to educate people and train them to spot bogus visualizations? "Meet the Data Team" events at news outlets? Cairo book signings? Maybe some kind of data awareness PSA video starring a bookish veteran actor? Natalie Portman? Jeff Goldblum, perhaps?

StephenJBeard
Natalie Portman could be great for that team. She has a degree in neuroscience and one of her advisors was Stephen Kosslyn, who has written extensively about visualization:

http://www.amazon.com/Graph-Design-Mind-Stephen-Kosslyn/dp/0195311841/

(By the way, time-series chart DON'T necessarily need to stat at 0. Bar charts do, yes. See here: http://flowingdata.com/2015/08/31/bar-chart-baselines-start-at-zero/)

As for education... What I am in favor of is discussing good and bad visualization openly on Twitter, Facebook, our blogs, our publications, etc. When we see a great visualization, let's praise it, and point out what it is so great about it. When we see a dubious one, let's do the same. Little by little, more and more people who are not designers and journalists will understand the grammar and vocabulary of visualization.

This is, by the way, what has happened with scatter plots in the last decade. See here: http://www.pewresearch.org/fact-tank/2015/09/16/the-art-and-science-of-the-scatterplot/

Since your title is so long, a picture is worth a thousand words, and you specialize in visualization, what photo or image would best sum up what you do?

conundri

You're right that my title is embarrassingly long. I usually introduce myself as a teacher of visualization, and wearing a t-shirt like the ones in the pics below. They say a lot about me, at all levels:

https://com.miami.edu/profile/alberto-cairo

https://twitter.com/albertocairo/status/644857683179343872/photo/1

Alberto,

How do you read? You read a startling amount of books, so I'm curious about *how* you read them. Do you skim? highlight? take notes? stop reading books before finishing? read in one place, or wherever you are?

What's your process for reading?

llimllib
I skim a bit here and there, but not much. I read print books, and I highlight and take tons of notes on the margins. I do that because I have a very weak memory. If you ask me about a book I read a couple of weeks ago, I may not remember what it said very specifically, but I can go back to the book, skim through the highlights and notes for 5 minutes, and all memories come back immediately.

I am always carrying one or two books with me. Always. I read when I get tired of writing or preparing for classes, during breaks between meetings, while the kids are taking a bath, and after they go to sleep. If I am not doing anything else, I am reading.

I don't watch TV (I do watch movies and good TV series, though) or follow any sport. A friend of mine from Brazil told me once I was lucky I don't like soccer at all. That frees Wednesday and Sunday afternoon for reading and being with my kids.

Reading is like any skill: the more you do it, the more efficient and fast you become at it.

What are the best ways to visualize complex advanced mathematics? eg. linear algebra, transformations, eigenvectors, inner dot products, etc.

thisisalili
Sorry, that question is way beyond my knowledge! I would refer you to folks like Al Inselberg (the inventor of parallel coordinates) and similar.

What do you think of zenon pylyshyn's views on mental imagery?

Limitedletshangout
I haven't read enough from him to have a clear opinion. Years ago, I found his reasoning puzzling. Kosslyn is much more convincing in this topic, in my opinion. But I'm not a cognitive neuroscientist!

A few years ago, a person would have to be skilled and knowledgeable to make a polished visualization, and I think with that came some assurance that the content would be represented thoughtfully and (hopefully) faithfully.

These days, with the advance of libraries and tutorials, it's getting easier and easier to make visualizations that look similar to those reputable ones, without necessarily the same responsibility regarding actual content of the data. What do you think can be done to address the future glut of "good" visualizations of bad data?

tungs

More constructive and positive criticism done by everybody who has the drive to help everybody else understand data and visualization and infographics better. We should all join the party. See this article:

https://medium.com/@hint_fm/design-and-redesign-4ab77206cf9

Alberto, could you talk about this graph?
http://twitter.com/SenatorBerger/status/644601764763729924

In North Carolina, our budget talks have been ongoing and last night it passed. During those talks, people claimed our education spending has gradually gotten worse while others (like in that tweet) claim it's actually not worse, and perhaps better. These claims are obviously partisan, so can you please cut through the BS? I think other people have replied to that tweet with less manipulative data. Thoughts?

uncertaincoda
Well, I should look into this carefully, but I'd say that raw counts aren't often the only metric you need. The number of students has probably changed quite a lot, so per-student spending is very relevant. Also, the make up of the student population: Is it more ethnically diverse, for instance (so it may require more English for non-native programs), richer or poorer (so it may require more remedial programs), etc. etc. etc.?

Are these numbers adjusted for inflation? A reader claims that they aren't, and that's a HUGE sin!

BY THE WAY, this example reminds me of something. This chart has probably been designed with the purpose of misleading people. But I've seen things like this done by folks who had the best intentions. Journalists and designers, for instance, in their rush to publish and in their common disregard for readers' capacity of digesting necessarily complex information, often oversimplify matters to this point: Showing just one variable. And the results are the same: A misled public. In my mind, both things are ethically wrong, in equal terms.

Must say I've been greatly informed by this Q&A session. Do you have plans for a documentary on data visualisation ala Hans Roslings' The Joy of Stats?

osumotrix
The AMA has just begun, osumotrix. For now, no, I don't have plans for a documentary, although who knows what'll happen when I finish writing 'The Truthful Art'!

I have a friend who works at www.followthemoney.org - you should consider working with them to help people in America understand the influence that money has on our political world.

My question : when do you think we will reach peak data - the point at which the collection of data will begin to diminish?

montaire_work
I'd love to hear more about their project. We have a student visualization group at the School of Communication at UM now (folks from this program http://mediashift.org/2014/12/miami-merges-data-visualization-mapping-journalism-for-mfa/ and others) and we're always looking for things to do.

It is difficult for me to foresee a peak data collection moment, really. Data collection is like a fractal. Today you're collecting it at one level of depth/abstraction and tomorrow you may move to the next one, and then to a deeper one. Is there a limit? I don't know.

You mentioned that you start your building process with a sketch. How much detail do you put

into this stage of a project? Do you find a more detailed sketch early on helps you down the road or do you often find yourself changing things significantly from what you originally drew?

notmythrowaway345
My sketches aren't very detailed, as they aren't intended to be shown to anyone. I do them just to envision the information and the shapes to represent it clearly in my head. Therefore, they are usually very poorly drawn sets of lines and simple objects.

John Grimwade, the guy I mentioned above, prefers to do sketches that very much resemble the final graphic. See this gallery:

http://www.johngrimwade.com/RR1.html

Hola, Alberto

Fellow Spaniard here. I asked this same question to Nathan Yau, but I'd like to know your answer as well:

I've been interested in data vis for the last four years, reading you, Tufte, Few, etc. Currently I'm working as the "infographics guy" in a market research company, but contrary to what anybody might think, I cannot really apply any of the principles and knowledge of data vis. I'm dictated what to do by either the client or the boss, meaning the type of charts to use (yeah, lots and lots of pie charts, they just cannot get enough of them), the colors to apply, the number of points/categories to show, cutting out the y axis in column charts to amplify the differences, and some more terrible things. This happens because society in general lacks a minimum understanding about data vis, specially in market research business, but since that is not going to change in the near future and leaving the company is not an option, what do you recommend me and people like me to do? I'm sure we are quite a lot.

Thanks ;)

mikelowski
Yes, I've seen this quite a lot in the past. Sorry to say, there isn't an easy solution for an organization like that. Feel free to show your colleagues this message: They are doing it wrong.

The way I've approached this in the past is to create the charts I'm asked for and then the ones that I believe will work better. Then I show them side by side and ask people to make estimates based on, say, the pie chart (without showing the numbers) and on the chart I propose. People aren't able to read pie charts well, so they can't fail to notice it. If after tests like this, they stick to their guns, well, there's little else to be done. Leaving that organization may not be an option for you now, but you will need to do so in the future. Otherwise, you'll get burned out.

Another way I've done this is to use an analogy with text. This works quite well with reporters and copy editors. The wording is: "If you are asking me to break a rule just because the graphic will look nicer (according to you), may I ask you to make some things up in the story you're writing just to "spice it up" a bit, to grab more "eyeballs", to be more "engaging"?"

The answer is usually "No way!" of course. Most people aren't willing to act unethically. Therefore, the subsequent words you can say are: "Well, if you can't do that, neither can I."

Finally, if you work in marketing and PR, folks may ask you to stretch the truth a bit, just to sell your product or idea better. This isn't just ethically wrong. It's counterproductive and it will undermine your brand. Why? Well, because nowadays there are assholes like me on Twitter and Facebook who will devote a couple of hours of their time to explain in detail why your chart is a damned lie. That's not good for you.

It's all about reasoning and being nice to people. Don't make them feel like idiots. Remember yourself before you read Steve Few. Imagine that you're trying to persuade your past self. That helps a lot.

Here you have some posts about it:

http://www.thefunctionalart.com/2013/09/an-imaginary-dialogue-about.html

http://www.thefunctionalart.com/2014/06/infographics-data-and-visualization.html

http://www.thefunctionalart.com/2014/01/ethics-and-aesthetics-in-news.html

http://www.thefunctionalart.com/2014/02/lying-with-infographics-and.html

http://www.thefunctionalart.com/2012/06/infographics-as-moral-acts.html

They need to understand that graphics are not things to be SEEN, but things to be READ. They have grammar, vocabulary, and certain rules we need to respect.

What is the "truth continuum"? Google brings backs mostly science fiction links.

elktamer
I explain it in my next book, "The Truthful Art" (2016). Basically, I say that arguments, opinions, scientific theories, charts and maps and visualizations... any act of human reasoning and communication, really... are never fully "true" or "untrue", but "truer" or "untruer".

You may strive to make a visualization "truer" by reasoning correctly about the data, by being ethical, by showing the data at the right level of detail, finding the balance between oversimplification and needlessly overwhelming readers, by using appropriate graphic forms that aren't very ambiguous, etc.

I illustrate that notion with several examples. This is an image I am using in the book (it won't make a lot of sense without the text that goes with it, but...):
https://www.dropbox.com/s/vq7haxtnsliyl9n/Fig30P7.pdf?dl=0

By the way, considering my love for Science Fiction I find it really great that Google gives you science fiction links when you search for a concept explained in one of my books!

My father is a reporter for a small newspaper. He always wants to include more visualizations of local phenomena, but expertise is in short supply and budgets are tight these days in journalism. Any tips for how a small paper can incorporate data visualizations? Eg: any favorite sources for data, tools for making visualizations, how to do print-and-web ready.

tgb33
Absolutely. The free tools and tutorials in this post will help your dad:

http://www.thefunctionalart.com/2015/08/new-articles-and-tutorials.html

Also, tell him about www.quadrigram.com. It's a simple and VERY powerful tool to produce websites and interactive visualizations. Here are some learning resources:

https://www.dropbox.com/s/8ju4m6fpmfjcgt6/QUADRIGRAMTutorials.rtf?dl=0

It's also important to learn about principles. Steve Few's books are good, Isabel Meirelles', Naomi Robbins', etc. See list here:

http://www.thefunctionalart.com/2012/06/information-graphics-and-visualization.html

And about stats; these are some of my favorite ones, organized from simpler to geekiest:

https://www.dropbox.com/s/j6dlrvfmw33mqe8/Week2_statsRecommendations.pdf?dl=0

Finally, I am always willing to help people make the leap to the Dark Side (my role model has always been https://www.youtube.com/watch?v=mv9G9rwWihg) so tell your dad to feel free to contact me if he needs further advice: alberto DOT cairo AT gmail DOT com

Hi Alberto!!

As a UM grad, what do you think about Al Golden? Should we fire him or what?

mschwa3439
Above I mentioned that I am hopelessly uninterested in sports. I actually needed to Google that name (oops!)

I don't see this as a virtue, by the way. It's just that there's so much interesting stuff to learn in the realms of science, statistics, journalism, graphic design, cartography, etc., that I don't see how I can fit more stuff in the 16 hours that I stay awake every day!

Hi Alberto!

I'm just starting out in the field, I was wondering what sort of statistical training you had and what training you think people need to get into this work.

Love your work!

jaimenez
Welcome to the Evil Empire, then!

I don't have any formal statistical training, other than a stats 101 course I did in college (also, I used to love Math in high school.)

What I did was to study a lot in the past decade. I befriended many statisticians, I listened to them carefully (three are actually helping me edit my new book,) did some courses, etc. This slide shows eight of my favorite books among the ones I used to teach myself, from easiest to most detailed:

https://www.dropbox.com/s/j6dlrvfmw33mqe8/Week2_statsRecommendations.pdf?dl=0

These and many others have informed what I wrote for my "The Truthful Art".

Hey, so random question about your "pipeline/ process" How much do you go to google to find images? Do you use stock photos? Have you encountered IP legality yet?

godzilla_rocks
I can't help much with this. I don't use stock photos or use images from Google. That said, in 3D projects, I use copyright-free images as textures sometimes

Hi Alberto, thanks for doing this. I recently finished my undergrad in journalism and my dissertation looked at the change in the use of infographics between now and the end of the 1980s. I found that not much had changed in the frequency of use, despite those that I interviewed stating that there was more of a desire for visually interesting data. It was an undergrad piece of research so it's can't be considered conclusive. As you have no doubt done a bucket load more research, I was wandering if you've noticed a rise in infographics within news organisations? Thanks!

Colbey_uk
No, I am not a researcher, so I haven't done any research about this. That's an interesting result! Did you include online media in your analysis, not just traditional newspapers? I have the feeling that new online-only organizations use many more charts and maps than traditional ones but I may be wrong in that guess.

Hi. Just here to say GO CANES!

-BA '12

fishp0ker
GO!!!!!!!

In artificial intelligence (AI) we use high dimensional data made of feature vectors, for example, a grandmother neuron which activates when you see or think about your grandmother and to a lesser extent anyone elses grandmother. I've been looking for ways to network these vectors together between peoples subconscious minds so we could communicate more directly and intuitively, maybe through some kind of flowing colors shapes and patterns on screen that react to game controls. What kind of high dimensional graphics and math would you recommend for networking minds together subconsciously?

BenRayfield
This sounds like a question that my colleague at the University of Miami Lynn Cherny (http://ghostweather.com/) can tackle. She's a computer scientist with a background in linguistics and machine learning. I can't speak about the Math but, based on the description, some kind of shaded map, based on gradations of hues, might work in this case.

Hi Alberto,

What, according to you, are some good ways of visualizing trade-offs on a chart. If its a trade-off between two things (let's say price and quality), it can be plotted on an x-y axis.

But what if it's a trade off between 4 things (let's say, price, quality, speed and variety). How would you plot that? How would you plot more than four things that are a trade-off.

The goal is to compare competing products on seeing what does each product excel at and what does each product compromise on. Thanks :)

akashmukherjee
Perhaps a parallel coordinate plot. They excel at displaying multidimensional data:

https://www.perceptualedge.com/articles/b-eye/parallel_coordinates.pdf

Hi alberto, can you teach @msnbc live about ethics bias regarding live data polling/visualization?

DigitalSuture
I don't know if I can teach anything to anyone, but I can certainly comment on great and not-so-great graphics! I haven't seen those you mention.

So... as somebody with a degree in statistics, you all are basically the ones the ruining the media right? People without math degrees deciding how the public learns about the findings

from scientific/research fields.

I don't even care if I get downvoted for this. You are the problem.

Alberto Cairo joined the School of Communication in January 2012. He holds a BA in Journalism (University of Santiago de Compostela) and a research-oriented Masters degree on Information Society Studies from the Universitat Oberta de Catalunya (Barcelona).

Doesn't make me think you know enough about math to teach people how to represent it.

This is the problem with scientific journalism. The people reporting on it are *just* journalists, and that is barely even a real skill set.

startrekdidit
I publicly ask people in this forum NOT to downvote your message.

First of all, I don't get your point, as this isn't a thread about scientific journalism, but about graphics, infographics, and visualization. Perhaps you wanted to send this message to a different forum?

In any case, I agree with you: We people who do this kind of work could learn more about science, and even have degrees in scientific fields. But some of of us do! If you were willing to do a bit of homework --really, it doesn't hurt-- you'd see that at places like ProPublica, The New York Times, National Geographic, etc., a good portion of the teams who do journalism around data and visualization do have degrees in fields like stats, mathematics, geology, biology, etc. And if they don't, they do have deep knowledge of those areas. As your message proves, a diploma hardly guarantees wisdom.

And visualization isn't just about math. It involves multiple skills, such as communication, graphic design, a bit of knowledge of cognitive science, cartography, coding and, yes, math. It's obviously impossible to be an expert on all those, so when I and others in this field have doubts about if something is right or wrong, we go to experts (statisticians, mathematicians, scientists...) to ask for help. We do that systematically. We collaborate. And we do our best to be aware of the gaps in our knowledge.

Can you say the same? I'm tempted to say that I don't think so, as you are so willing to pontificate about domains you clearly know little about.