

Hannah Fry | Hello World: Being Human in the Age of Algorithms

September 25, 2018

“In the age of the algorithm, humans have never been more important.” — Hannah Fry

INTRODUCTION

Dr. Hannah Fry is an Associate Professor in the Mathematics of Cities at the Centre for Advanced Spatial Analysis at UCL. She works alongside a unique mix of physicists, mathematicians, computer scientists, architects and geographers to study the patterns in human behavior - particularly in an urban setting. Her research applies to a wide range of social problems and questions, from shopping and transport to urban crime, riots and terrorism.

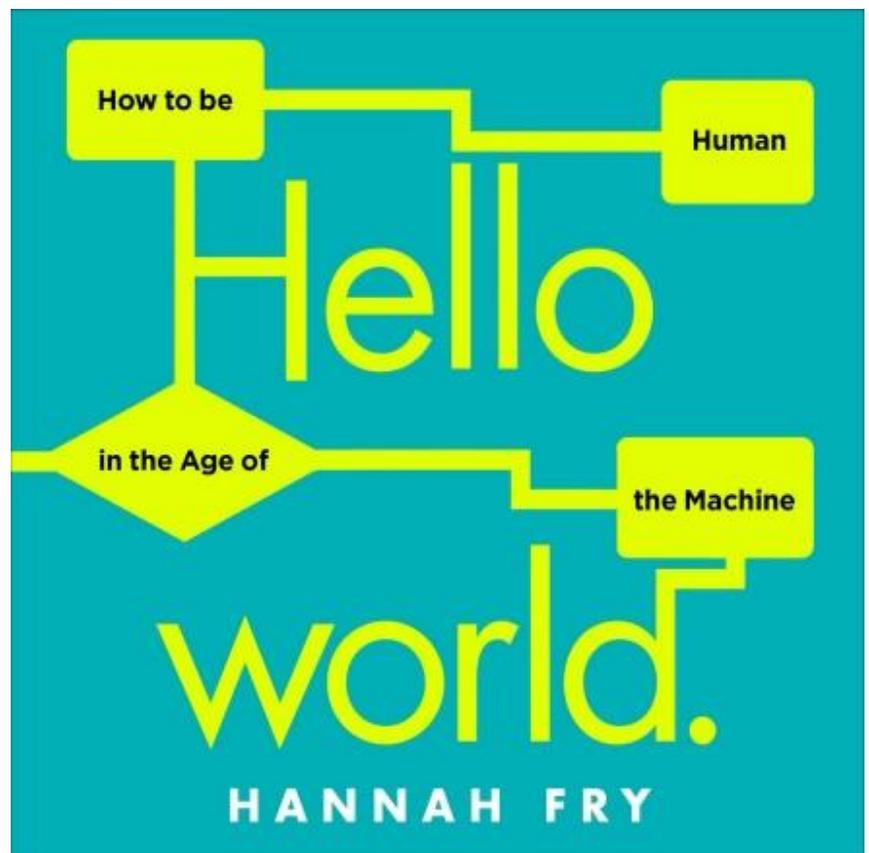
Hannah has published popular maths books *The Mathematics of Love: Patterns, Proofs, and the Search for the Ultimate Equation* (Simon & Schuster/ Ted) and *The Indisputable Existence of Santa Claus* (Penguin Random House/Transworld). Her third title, *Hello World: Being Human in the Age of Algorithms* (Penguin Random House/Transworld UK; W. W. Norton & Company US), is on sale now wherever books are sold.

OVERVIEW

What is often missing in debates about our technological society is nuance. Hannah attempts to balance the pro's and the con's associated with our use of algorithmic intelligence in managing more of our human affairs. As she says in her own words, “This is a book about humans. It's about who we are, where we're going, what's important to us and how that is changing through technology.” It's about our relationship with the algorithms that are already here, the one working alongside us, amplifying our abilities, correcting our mistakes, solving our problems and creating new ones along the way. It's about our relationship with the algorithms that are already here, the ones working alongside us, amplifying our abilities, correcting our mistakes, solving our problems and creating new ones along the way.”

QUESTIONS

1. **Hello World** — You open the book with a superficial and more obvious explanation for the title, which derives from a sort of rite-of-passage for rookie programmers learning to code the words “Hello World,” but you also give a deeper explanation for why you chose this title. You write that it's “a reminder of a moment of dialogue between human and machine.” I fixated on that word “dialogue,” because I feel that this is what is missing in our relationship to technology. Is this what you were hoping to achieve by writing this book? Did you want to further a real dialogue about the benefits and the costs of our relationship to these increasingly intelligent machine that isn't based on emotions or preconceptions?



2. **Man vs. Machine** — Another thing I really enjoyed about your book is the way in which you weaved together anecdotes about human encounters with algorithms that serve the purpose of showing us something about not only computers, but more often, ourselves. The first such anecdote is that of Gary Kasparov, the great Chess Champion, and his famous loss to IBM’s Deep Blue. At one point, you say that he would put his watch back on as a signal that he was “bored with toying with his opponent.” Why did you chose this story to start the book? There seems to be an interesting parallel in how Kasparov would toy with machines and how he projected that the machine was toying with him. [1]



3. **What is an Algorithm?** — I think it would be useful to give listeners a better understanding of what we mean when we speak about algorithms. In your book, you break them down into four main categories by virtue of the task they perform. These are **prioritization** (making an ordered list), **classification** (picking a category), **association** (finding links), and **filtering** (isolating what’s important). Can you define what an algorithm is for us and what each of these categories means in practice? Where do we see such algorithms implemented?

4. **Blind Faith** — You tell two, similar stories in the book with two very different outcomes. One is the story of Robert Jones, who almost got drove himself off a cliff by blindly following his BMW GPS, as well as the story of Stanislav Petrov, who, by questioning the answer being provided by the Soviet early warning missile system, may have prevent World War III. This comparison demonstrates “the balance of power between human and algorithm, who – or what – should have the final say?” Do you believe that today’s Stanislav Petrov may be more like Robert Jones? When you read stories like this, does it frighten you that humans in positions of such power might be becoming complacent?

5. **Bigger Data** — You devote an entire chapter to the subject of Big Data, which I think is more on the mind of the public today than we might have expected only a few years ago. First, do you agree that “surveillance capitalism” has entered the public consciousness for the first time in recent years, and if so, why do you think this is the case? What are the trade-offs in this case (e.g. big data medicine means less privacy but more cures)? What is the best way forward, and are there jurisdictions or countries that are doing a better job than others? How important is it that people have ownership over there data, where they decide if and how they want to make it available to a third party? How important is it that people be given something in return for their data – a value exchange?

6. **Algorithmic Justice** — You spend some time in the book delving into the implications of relying on algorithms for our judicial system. You mention something known as the “Burgess method.” Can you tell us how much of our judicial system is currently systematized using these types of “decision tree” algorithms? What are the pros and



cons of using such approaches? Is there a danger that, in fields like medicine or the law, where liability is preponderant, that technology can free practitioners (doctors and judges) of responsibility? It seems to me that expect unrealistic excellence from human professionals, but not willing to bear the costs of their mistakes, even if they can sometimes give us better results than the algorithms. What do you think about that?

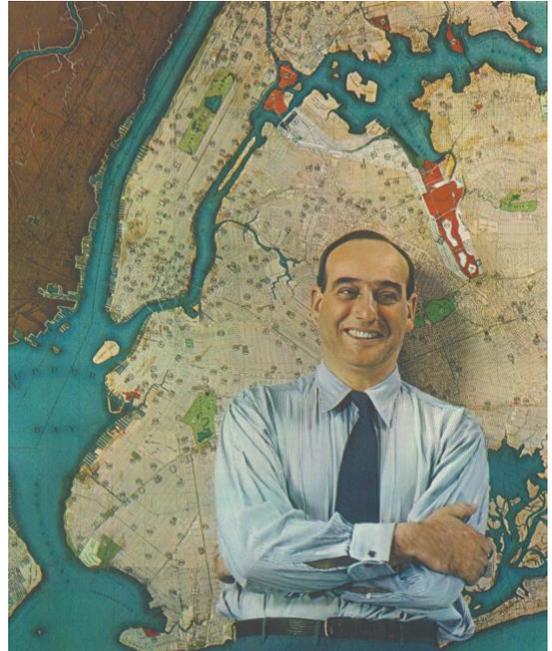
7. **Racist Bridges** — You mention Robert Moses in the book and his construction, among other things, of “racist bridges.” I thought this was a wonderful way of capturing the omnipotent ability of algorithms to impose a human bias in very non-human way. Can you give us some cases where algorithms have generated (or generate, by virtue of their procedure) biases that can lead to miscarriages of justice?

8. **Autonomous Driving** — You spent some time covering the subject of autonomous driving vehicles. This is a subject that has captured the public imagination. Why do you think people have been so mesmerized by the prospect of autonomous driving, more so than perhaps other impressive technologies? What are some of the challenges that make autonomous driving difficult, and which highlight the difficulty of implementing such a technology in the world? This may be a good opportunity to draw the distinction between rules-based algorithms and machine-learning algorithms. Also, can you talk to us about the Trolley Problem, what it is, and what challenge it highlights in areas where machines previously operated by and for the sole benefit of the operator and his/her passengers are now being automated? (quote from focus group: “You’re going to mug them right off. They’re going to stop and you’re just going to nip round.’ nuance: These cars scan be bullied”

9. **Bayes’ Theorem** — You mention Bayes’ theorem in the book, something that we have covered tangentially in prior episodes. This is what is known as “inductive reasoning,” and it’s crucial to understanding how we are building increasingly intelligent machines able to solve complex problems. What is Bayes’ theorem, and why is it important?

10. **Complacency** — Can you tell our audience the story of Air France pilot, Pierre-Cedric Bonin? What does his story teach us about the importance of maintaining our skills and the dangers of complacency? What does it tell us about our relationship to computers and our integral role in the process?

11. **Crime** — How is technology being put to the use of fighting crime? What technologies are on the forefront of crime fighting and prevention? (face recognition, profiling, data analytics, etc.) What are the trade-offs here? At what point do you prioritize the victims of preventable crimes over the victims of the algorithm? Let’s talk Luke Skywalker vs. Darth Vader. Let’s talk sesame credit system...



12. **Computer Tastes** — You tell the story of this girl group called “Vanilla” in the book. I listened to the song. It was HORRIFIC. What did you want to teach us with this story? What do we know about how humans determine what qualifies as good music, how we incorporate feedback from our environment (i.e. other people), and what role to algorithms play in that mix? Why is it so difficult to predict whether a movie is going to be a hit or a flop?
13. **Future** — One of the things I liked about this book is that it was measured and even-handed in its look at the role of algorithms in our lives. I want to end with a quote from the last paragraph, where you describe the future you are hoping for as being: “One where we stop seeing machines as objective masters and start treating them as we would any other source of power. By questioning their decisions; scrutinizing their motives; acknowledging our emotions; demanding to know who stands to benefit; holding them accountable for their mistakes; and refusing to become complacent.” And you end by saying,
14. **Concerns** — What concerns you most when you look out over the horizon? What are the scenarios that concern you as a mother, a citizen, and a human being? Do you think we can manage to navigate this world without losing our humanity if we have not agreed on what is fundamentally human?

OVERTIME

1. **Motherhood** — How has being a mother impacted the way you view the subjects we have discussed in today’s conversation? How do you think about raising your child in this world? Are there important life skills or experiences that today’s children may not have as a result of their relationship to technology and the intermediation of social reality through the screen?
2. **Mathematics** — Do you think we do a good enough job building solid foundations in mathematics and information science in our schools and universities? How would you reform the educational system in order to improve people’s understandings of subjects that have possibly become as foundational to modern society as epistemology and ethics?
3. **Adventure Nerd** — You have *SUCH A FUN LIFE*. I spent some time this morning scrolling through the media page on your website, and you are a bit of a phenomenon in Britain. How did your career as a public educator and entertainer begin? What is it that draws you to this vocation? Did you have any early inclinations that you would like this?
4. **Brain** — How does your mind work? You seem to straddle two divides. On the one hand, you have a strong understanding of STEM, and on the other, you are very artistic. Is this empowering?
5. **Learning** — How much of who you are today and what you know has come in the last 5 years, and how much of it was the result of work you put in earlier in your life? Or, does this all just come naturally to you? What do you do to further your understanding and deepen your knowledge?

