ISOJ 2018: Day 2, Morning Session

WHAT'S NEXT: Artificial Intelligence, Machine Learning, Blockchain, Augmented Reality, and Other Tech Trends That Will Impact Journalism

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Deborah Basckin: Hello. My name's Deborah Basckin. I'm a producer at NBC Left Field. And once this shows up—I don't know if it's gonna happen—I'll be talking about a project I'm working on with a colleague of mine called Owain Rich. And the two of us have been working in the realm of VR, AR, and MR, all the R's, as we were saying. OK. Super exciting. What's next? Yeah, okay. So, this is us. Those are our Twitter handles. And what I'll do today is, I thought I'd start off by talking a little bit about the project we're doing. I'm not going to assume everyone has seen what we're up to. And then talk a bit about what we were thinking when we did it, what we've been thinking since, and where that might go in the future. So, hopefully, that leads into the What's Next kind of question.

So, as I said, before I start explaining anything, I thought I'd show a few clips from some of the episodes we've been making. So, they're all short features. They're about between two and three-minutes long. And here is a little, little bunch of those.

[Video plays.]

Deborah: And contrary to popular belief, it's not the words love*,* sex*,* secret *or* God *that are getting us into trouble. This other spike is in the sixties when all the baby boomers, the kids born from these weddings, actually came of age and started to marry each other. There are 127,000 hours of sports to watch. At the end of the day, for every hundred people who make them, ultimately, only 9% of people are going to keep them. There are a lot of factors which feed into sports improvement, whether it's increased fitness or advances in medicine or doping. Overwhelmingly, love is the main reason people get married.*

[End of video.]

So, that's some of what we…. [applause] Oh, thanks. So, that's some of what we've been working on. I think the most mixed part of that reality was me talking about sports. [laughter] But what you can see is, it's kind of animated, it's fun. We're using data. It kind of lends itself to data visualization and to sort of speaking to… [Video accidentally starts playing. Then stops.] Right. And so, as we move kind of working through how this whole process was going to work and how we were going to think about it, I keep coming back to the fact that it's a bit like the sort of bizarre lovechild of Hans Rosling and Picasso's light paintings. And so, that's what we're keeping in our minds as we go along—the fun that we can have with it.

So, mixed reality. OK, there's lots of blurry lines between all the kinds of realities, but mixed reality, often when we hear it, we think of something like this. And it's huge, and it's really interesting. People are kind of sort of displaying their live game play. So in an image like this, you've got about 80% is the virtual world and about 20% is the real person world. And we've decided to kind of flip that on its head, and so that's what you've seen in our clips.

This is how we do it. I could spend four hours on this, and Owain could spend maybe three to four years talking about the rig that we built and the way that it's running. But I will kind of summarize and say, this is our setup. And what we're doing is we're taking the virtual reality, the drawings that I'm doing, and live compositing at the same time with the real reality that we're filming. So, what's being spat out at the end is actually a finished product. It takes virtually no post-production. We're not using any graphics or anything else.

And here's a shot of Owain as he's filming me. We're using a glide cam as part of our rig, and you can see behind him is a monitor, which is showing both the drawings as well as the real world that we're filming at the same time.

So, how we came to think of it. So, we were talking about VR a lot. And we, Owain and I, come from an innovation background as well, but we've also always primarily been program makers. So, we were quite keen to make something that we could use immediately. Sort of that instant gratification of being able to be producers and be journalists. And he worked previously and I'd been near it on a piece for virtual reality as a platform. So, we made a piece called Trafficked. It's excellent. I advise everyone to go check it out. But this is very much creating a piece for VR as a platform. So, this involved using a game engine, modeling, graphics, a bunch of other people, and huge, huge sort of production line. I mean, it was a small team, but it takes a long time to make.

And we flipped that again, and we are now using, instead of making something for VR as a platform, we're using VR as a tool. So, what we're using is Google Tilt Brush, which is a totally commercially available product that anybody can have if they've got the setup. And we're bending it. And there's a lot of bending. We're bending it to our use to tell stories. Ultimately, we just like to connect with audiences in new and innovative ways. So, the moment this presented itself as something we could do after lots of tinkering and trying and innovating, this is what we've come to.

So again, it's just distinguishing massively between making something for VR, which will be seen by people with VR headsets, and using VR as a tool to actually essentially make quite a traditional piece of broadcast, which is video, which is where we come from. This is where we took it outside and I left my soul on that shoot.

And so, to talk about what we've found as we've been going along, the process itself is quick and nimble, and we believe that the result is direct, authentic, and hopefully a bit disruptive. So, to explain a little bit about what I mean by each of those. So, we're working on a schedule of about five-to-seven working days between having an idea, scripting it up like this, shot listing—well, research, writing, shot listing, filming, editing, grading, putting the sound in, and delivering within five-to-seven working days. Which when you think of, you know, some video that's either very long or very short, depending on the quality and what you're trying to achieve, and of course, I think like goldfish in a tank, they tend to grow and shrink to the time that you are given. But we think that's pretty cool for two-and-a-half to three minutes. So, we're going from something like this—the script, some images, some ideas—to something like this—what we're making, what we're drawing, and trying to do it within five-to-seven working days.

When I talk about being nimble, I was going to say agile, and then I realized that was going to send everyone frantic. So, it's not agile [but] nimble. This is the team. That's me and Owain working hard. And I have huge respect for news graphics, for graphics, for data teams, and all of those things, but this is another way of making a product that is—that avoids kind of workflows and snarl-ups that you might have. So if you're left with two people in a room, this is the kind of thing that you can create. So, that's what we mean by a big nimble.

When we're talking about direct—and it's really bizarre to be that tall—when we're talking about direct, because of what we shot and the way that we're doing it, there is a seamless integration between the presenter and what they're presenting. So, there's nothing too artificial. I'm definitely talking to those graphics, to those things that I've drawn. And I think that that comes across as quite engaging for an audience.

Which leads me into the next thing, which is this buzzword of authenticity. Everybody wants something authentic. And bizarrely, in this way, you kind of get it. No matter who the presenter is, they are the art director. This is my terrible handwriting and these are my drawings. And thinking about how this might sort of expand outward, whoever presents is going to put their authentic stamp on it and speak to their own work. So, there is that immediacy which obviously does very well on sort of social platforms and online, but is also just engaging, I think, for a lot of audiences in general.

And when we talk about being disruptive—this is just a screen grab—we come from broadcast media backgrounds, so we know that people are quite blasé about the tropes of news, and news video, in particular. So, you know, anything you can do

to kind of wake people up and sort of shake them a little and get information a new way, we think, is quite, hopefully, quite attention grabbing, and, you know, strays from being a gimmick. We're very committed to the actual journalism of getting a message across and being able to explain things in new ways. So, a lot of what I keep saying, and somebody actually mentioned it earlier, is, we think this lends itself to a kind of back-of-the-napkin explainer. That moment when you're in the pub or bar and your friend wants to explain something and is getting frustrated and eventually takes a napkin out and draws it with a pen. That's kind of where we're sitting and where we hope a lot of people will start to engage with us.

So, thinking about the future. Of course, I've mentioned news graphics before, and I love news graphics teams, and they do amazing stuff. But we can also think about how this might be used in a news sort of storytelling way, perhaps even for live television. We have used it in a live setting. Of course, it lends itself to explainers. That's what we were talking about—back-of-the-napkin. And we've been approached by people, you know, from the worlds of science and education, who see huge scope for its use there. And of course, politics. We were talking about speed and getting to have that information quick. This is quite…. It takes a huge amount of work to get up and running and to work out how to do it, and I'd be happy to go into that, but it's ultimately something that can be quite quick to create and quite quick to broadcast. So, that works for the immediacy.

And then future thinking for the workflow. It does speed it up if you're a team of two. Again, that depends on what you would like to create. But for the skills you need, this is quite interesting. I have absolutely no artistic capabilities whatsoever! But the tool itself is really fun to pick up and play with. And the moment you start having fun and the moment you start bending your mind to what it can and can't do, you know, the sky is the limit.

And thinking about how it might be used actually from a sort of creation side, there is a moment if you walk into a newsroom or to a 3D sort of graphics department, there will be people sort of moving 3D models around on a 2D screen. Whereas, actually using the Google Tilt Brush or using a headset like this might allow you to draw and create these things in three dimensions. So, you might walk into a newsroom and see a bunch of people standing in rows, kind of moving around like this, and creating assets for future use.

So, essentially, just to wrap it all up, we've been working this out. We've spent a lot of time figuring out what it can and it can't do, but the key takeaways, I think, are using VR as a tool, as opposed to making something for VR as a platform. And the sky is the limit. We've taken a consumer tool, a consumer product, and made it work for us, but still with a commitment to journalism and explaining things.

Thank you.

[Applause.]

Jarrod Dicker: Hey, everyone. I'm the one who gets to talk about Blockchain, so, how lucky am I? [laughs] But anyway, I did come from The Post, where I spent the past three years. So, it was a very difficult place to leave, but I start with that because what we're doing and what I aim to focus on at Po.et is very aligned with the ideation and ideologies that I focused on at The Post. So, I work on the business side of media. Prior to The Post, I was at The Huffington Post and Time Inc. and others, with a strong focus on how to be directive. I think we constantly are running uphill in the business of media, whether that's ad blocking, fraud, viewability, right? A lot of negative connotations associated with it. And I think that's because we're extremely reactive as a business, right, where we're trying to see what the platforms will do. We're trying to see what advertisers are asking for, instead of being more directive, right, and investing in things like technology and other efforts that help clients, consumers, readers get from A to B faster.

So, I took that here. And I always start with Paul Ford's article, Who's a Friend? But this came out like two days after I decided to go to Po.et. [laughter] And the title is Bitcoin is Ridiculous and Blockchain is dangerous. And Paul writes amazing articles around technology. And I think that it's extremely important for a lot of perceptions like this to come out, because you have a lot of arguments today, right? You have, like, the rowdy and the dowdy when it comes to Blockchain. People that say, "Blockchain is going to change the world. If you're not onboard, you don't know what's going on." And then there's people that are like, "I can't stand this. I want nothing to do with this." And I think that it's important to also understand that people think that an argument is to separate Bitcoin and currencies and Blockchain and say, "One is different than the other." But the idea of this, like, cultural shift and what's happening with the economics, it's important to realize that they actually do go hand in hand.

And there is a question that many companies should ask themselves, which is, like, why use the Blockchain versus using a database? And are people like the Long Island Ice Tea Company just using Blockchain to increase stock price? And I think you're seeing a lot of that right now, and unfortunately, it puts a damper on all the exciting things that are happening here. But within Paul's article, he said, "One of the most important thing the Blockchain offers is a way to really build culture." And that, I think, is extremely important in this space, right? Blockchain is coming. It's an exciting technology, as the cryptocurrency market as well. It's been around for nine years now, so no one can say that they're an expert on Blockchain and has worked in it for a decade, because no one has, right? It's only been nine years.

But I think what's extremely important is for us to be prepared, especially in media. That's why, again, I'm at Po.et and what we're focusing on, right? I don't think new technologies will do old technologies better than those old technologies, but that's why they're old, right? In 1993 when the internet was coming and people would say, "But I'd rather use the fax machine. It is better at communicating messages," that was true, but not investing in the internet and being prepared for the economic shift that it brought every single pocket of industry wasn't the best idea for many businesses that no longer exist here.

So, that's where I think Blockchain is extremely interesting, right? If we could start building on protocols, right, in this next layer of internet, focusing on things, particularly, the media, that are extremely important, then what we're able to do at Po.et and other companies in this vein, are able to work with media companies, advertisers, and others in this space to help them when they're ready to start embracing this technology.

So, I always like to listen. And I was convinced, right, and similar to my previous jobs, that everyone in media was saying, "The platforms are ruining our business. The bundling models are going to over-bundle. Advertising is struggling." So, I said, "OK, this is going to solve it." And then, of course, everyone is like, "Po.et is a solution in search of a problem," right? And I think that many great ideas start that way. You know, I think, like, a solution in search of a problem actually does eventually create a solution.

And especially within media, there's things—there's like two things that are extremely important to realize, is that, attribution in media is a real problem, right, when it comes to being able to identify news and information and be able to store it and archive in an immutable leger, right? Early days of the internet, the idea was that your information and your storage cannot be impacted by any outside source. And now with centralization and cloud computing, like, there are data centers and there are pieces of information that, if they did go away, you would lose that, right? So, the idea of attribution and how that works is important.

And then being able to take that data and understand what the value of media should be, right? I, for one, believe that media is extremely underpriced. However, it's very hard for us to really figure out what that is. There's no free agency market, like in sports, to be able to dictate how much content and how much the value of an effort of work should cost. And what if Blockchain could be solution to help for that?

So, there's kind of three questions that at Po.et we look to answer, like, who owns media digital assets? How do you license and syndicate it? Like, how do you get your content out there in an intelligent way so that it can't be copied? So that it can't be stolen? When I say, "Content," I mean ideas, right? It's not just articles or videos or images, but it's when you press 'save'. On PowerPoint or Photoshop, how do you enable that art? And what is the origin of this asset? Like, do you want to get to the source? Especially as it pertains to this conversation, how do you source? How do you push out bad actors? And how do you leverage a decentralized community to help find the truth?

Attribution is a product that we're focusing on now. So, to be clear, Po.et is an open-sourced protocol. So, it's a non-profit business. We have to date—we just hired—but we have about ten engineers in the Blockchain stack. So, there's probably about a thousand engineers that work in Blockchain around the world, and every single company is jumping on them with their one or two years of experience, so that's where we see a huge value in what we're going to be doing

here when it comes to media companies and publishers, is that we're focusing on this and then trying to bring it to the masses to be able to learn and evolve from.

So today, there's certain companies that are working with us that are just timestamping and putting metadata ownership of their content on their site. So whenever they press 'publish,' whenever they press 'save,' we scrape the metadata, we timestamp it, and it's stored on the block. It's immutable. It's there. it cannot be changed. And the value of that is that it's really the future of what the archive looks like. Here, you're able to edit, you're able to send licenses. So, say, if The New York Times has a partnership with Medium and Hearst, right now, they're probably signing contracts and deals and taking a huge leap of faith that the rules will be followed. This sort of technology allows you to say, "Well, if A doesn't equal B, then it will not work."

Then, we're building this. I'm extremely ambitious to say we're building the future of the internet, but I really believe that we're building something that is going to help make the internet better, especially in the media space. And especially when it understands what could be built on top of this, right? So, being an open-source protocol, we are building tools that are helping different pockets of business. Leveraging Blockchain for storage and immutability, but also for discovery. Really figuring out, what do these tokens mean, right? When people are buying cryptocurrency assets, how can you be a subscriber to multiple publications, right, without having to go to each one? And how do we recognize those users throughout their entire journey? That's something that, again, Blockchain is bringing value to here.

And another thing that I think is important, and it's a big theme here, is the idea of content being discovered. And I love the sentiments lately that we can't really value content based on visits, UVs, PBs, because that kind of propagates, you know, a bad business and advertising economy, that we're really looking at the wrong things when we should be focused on others.

And I think that the word discovery is a clear indicator of that, right? When we think of discovery, we think about how to get a piece of information or content in front of the most people possible, because we feel that the reward is to get that group of people back consuming our content. And I think that discovery is a bigger issue. Like, thinking outside of our bubble and circles, people have ideas. Screenwriters are creating like movie scripts that they want to syndicate and share around, but are scared that if someone sees it, they will copy it, right? And that sort of idea of people creating ideas and creating information keeps them from putting that art and that information out there. So, what we're looking to do with discovery, too, is giving people faith and opportunity to know that they could put their work out there and then be able to know that it's safe, right, and there's an origin of truth.

So, we have different applications that allow other publishers to do this. And we're also building out these marketplaces, so the other value of Blockchain and what's really happening here is the decentralization of having many different players come

in and be able to weigh in on a source of information. So, building a reputation system, building governance, but really being able to take advantage of what all these things could do. And again, not saying that Blockchain today is the solution for all. But again, going full circle, similar to internet in '93. If we're focusing on these things and preparing for them and building on top of them, then these cold libraries and opportunities will be available for everyone in this room to be ready, right, when this wave comes and react accordingly to help better your business, better your community, and better the overall media ecosystem.

So with that, what's next? And I will say, Blockchain in media. So, thank you.

[Applause.]

Zach Seward: If we define augmented reality as simply the combination of physical and digital worlds, then I think you could argue that the first major experiment in AR for journalism was the infamous CueCat, circa 2000. The device that allowed users to scan a barcode and publications, like Fortune, Wire, The Dallas Morning News, and get contextual information related to what they were scanning on the internet. Of course, it required having this ridiculous looking device in the first place, reading the print publication, while seated next to your desktop computer, and then frankly, when you did all of that, the information you got wasn't particularly worth the trouble you'd gone through.

Flash forward another decade, we see further experiments in AR for news. This one from Esquire. They put a QR code on their cover, and all of a sudden, Robert Downey, Jr. is coming to life; though, again, in front of your desktop computer in a somewhat implausible scenario. Kind of a cooler, more interesting experiment, which the Rolex ad right there on the back sort of explains what was going on or what might have motivated that particular experiment, but not particularly practical, nor particularly useful to the user.

Flash forward another decade to today, and AR seems to be having yet another moment. We see a slew of AR apps come out in the last six-to-twelve months. And I'm here to argue that this time, the third go around for AR, is for real.

So before we go any further, it seems necessary to just define some terms, explain what I'm even talking about in the first place. It helps to draw a spectrum. So, you've got a real environment on the left and an entirely virtual environment on the right. You know, as Debra was explaining, some people just use the term *mixed reality* to speak to everything in between the two poles. But closer to the right side of the spectrum is what we typically refer to as *virtual reality.* And those are the extremely immersive, amazing experiences that require, again, putting on a fairly inaccessible piece of equipment to view. Toward the left side is AR. And though the experiences often fall short of what's possible further to the right on this spectrum, experiencing it merely requires the phone that's already in your pocket. And that in a nutshell explains what I believe is like the real potential here and why this is the moment for AR in our industry and in others.

It's really a confluence of three trends happening at the same time right now. So one is transformation in how people communicate from an entirely text-based communication to one that's dominated by visuals. And not just any visuals, but ones that the users are really comfortable manipulating themselves. So, I don't think people particularly think of Snapchat and Instagram lenses as AR, but that's exactly what they are. And I think at their core, those two apps and a lot of other messaging experiences are fundamentally AR apps being used in entirely mainstream ways.

Second major trend is just advances just in the last two or three years in how computers see and are able to find plains and depth information on a flat image, so transforming 2D experiences into 3D. That wasn't possible just two or three years ago. All of a sudden, it's very much possible and in most of the phones we have.

And then the last is what I was saying earlier, that all of this technology has been bundled up and available now in most phones running IOS and Android. It really is just like this confluence of events in the last six to nine months that have led to this moment for AR. It was kicked off in June of last year when Apple announced a new toolkit for developers in iOS 11 that suddenly made it *way* easier to create AR experiences in apps. Google followed quickly with their version of essentially the same thing. It's an Android 7 which is already in most high-end Android phones and], like, coming soon to all Android phones. And between those two, you've got nearly 100% penetration of smartphones suddenly capable of really full-scale AR experiences in a way that wasn't possible before. And that helps explain why in quick succession all of the major technology companies have released their version of an AR studio allowing developers [and] creators to make AR experiences for those tech companies' own apps.

At core, we've always had a sort of hobbyist level interest in things like 3D modeling, 3D printing, 3D scanning, but it was just this kind of thing we did in our office for fun, not something that really applied to our journalism. With the release of ARKit, it seemed like an opportunity to meld that hobbyist level interest with the journalism we were doing. And you may know that we have had for two years an app for iOS and Android that tells the news in a conversational interface through a mix of texts, emojis, GIFs and static images. So, the idea we had was, what if we just thought of 3D models as yet another media type that we could put into the mix of our storytelling when it seemed appropriate.

So, for instance, when SpaceX had its inaugural launce of the Falcon Heavy, we were able to obtain a 3D model of the spacecraft itself. And it's the kind of story where you could try explaining in text to the reader, to the user, what's so special about the spacecraft, you could show the user a photograph of the spacecraft, or you could give the object itself to the user and let them place it in their physical environment, manipulate the object, literally walk around the object, and get just a far more helpful and explanatory experience of what's going on here, [and] what's so different and cool about this particular spacecraft relative to others, for instance.

So, we don't do this every day, not even every week, and not every…. In fact, most news items don't particularly lend themselves to being presented as a 3D model in an AR experience, but we've found that some really do. So, space does tend to be, you know, a theme here. This is the Cassini spacecraft that orbited Saturn for several decades and was coming to the end of its run. It let users take a look at the spacecraft, see what it looks like at actual size, walk around it, [and] have a real experience with the object. When the Rosetta Stone was suddenly back in the news because of a new research report, it let people place it directly on their desk.

And the Berlin Wall news item we had done about that. This is perhaps my favorite example we've done, because it really sort of explains why you might actually want to see something in 3D as opposed to a flat 2D image, where you're able to see both sides of the wall. Because this is such an amazing high-resolution scan of the wall, it even [is] just going up right into the nooks and crannies of it, you know. It gives you a view of the object that you wouldn't be able to get any other way.

Some of the design challenges we faced when presenting this. This is not something that users are comfortable or used to finding in their apps today. So, one challenge was simply how to explain what the hell was going on. Do we call it AR? Do we call it 3D? What sort of icon would explain that when you tap this something else is going to happen? As a user, you're going to have to be doing — you're going to take some actions in order to manipulate the object. We settled on the call-to-action "Explore it in AR" to sort of suggest that the user would be in control and have more of an experience, rather than just viewing an object.

We also had to explain what the user needed to do, because they all of a sudden need to place the object in their environment. And placing something in AR requires finding like a flat surface. You can be holding the phone in the wrong way. We don't want this to all of a sudden feel like a laborious experience, but a fun one, because the wow factor of AR sort of quickly wears off if you're struggling to place the object in the first place or don't have enough light in your environment to place the object at all. We also found that a really helpful affordance was to put the object in a translucent sort of ghost mode hovering over where you might be placing it before you actually tapped to place the object. It helps the user figure out what exactly is going on and not lose their place when they're trying to view the actual reality in front of them and then this augmented reality on the screen in their hand.

We went through a whole host of options for what the actual AR viewer itself should look like. There's all sorts of things you can do once you've placed the object. But what we found was actually the better approach was to do as little as possible or put as little as possible on the screen itself and let the object shine above all. This was the first version that we shipped, and then a later version actually tried to strip away even more functionality; though, we did add one thing you see in the bottom right-hand corner—a screenshot tool. Because what we found even before that tool existed was that it turns out this is sort of an instinctually shareable experience. And so as we placed these objects in the app, people would place them in unusual places where they were around the world, take a screenshot, share it on social media. This is a Tesla Model 3. You can't get one as they've rolled off the factory

floor, but you can get one in the Quartz App. This the Tesla in the Auckland Airport. This is a Chevy Bolt owner—that's an actual Chevy Bolt in their driveway in the back—trying to test what another electric vehicle in the driveway would look like. We did a great story on the 808. There's the Rosetta Stone again. And this is that slice of the Berlin Wall, this time, in Copenhagen.

People asked for an archive, and so we gave it to them. Everything else in the app is ephemeral, but it did seem like the nature of these objects and the timeless nature of the news stories they were attached to befitted giving people a way to access them again. And so, swiping over to the right of the main experience gets you the archive.

It also made us focus for the first time on iPads, which are just about 10% of our active user base for the app, but a lot more important when you're talking about AR, because it's just a much better experience for AR with the larger screen. And you can see Apple itself is emphasizing this. That's our app behind in the background at a recent Apple event, where they view part of the potential of the iPad, as a device, is in AR.

Other news organizations are doing pretty interesting stuff as well. The New York Times did an experience around the Olympics. The Washington Post did an AR game also around the Winter Olympics. USA Today recently released an AR-only app to do your own rocket launches. You might conclude from these examples and my own that space and sports lend themselves pretty well to AR, which is true, but I think more generally what's happening here is it takes a lot of time and preparation to do a 3D model for a story like — for stories like these, and so ones that you can plan for, you know, months ahead of time are just more natural fits than breaking news.

Of course, they're not all great experiences or experiments we've seen thus far. This is a cryptocurrency app displaying market data for cryptocurrencies in AR. With machine learning, if they somehow fit machine learning in here, we would have all of the buzzwords on our panel. But this is like just the right combination of useless and annoying. [laughter] And I think a good example—a good reminder—that there will be plenty more CueCats before we really find like the perfect use cases for AR in these.

Thanks.

[Applause.]

Jeremy Merrill: Good morning, everybody. Thank you all for coming out. And I wanted to thank Rosental and Mallary and the rest of the ISOJ team for recognizing this great conference. So, what I'm talking about today, what's next, is machine learning/AI. What we're going to talk about is, like, what the heck these things even are. Because like as Zack was saying, it's a big buzzword. Everyone is claiming that they're using it. We're going to talk about some examples of how machine learning and AI are actually being used by journalists in newsrooms today

and in the past couple of years, so, theoretically, how you'll be able to use these. You can use them now or in the very near future. As well as some ways in which these technologies being used by people outside of journalism are going to cause us some problems in ways that can be pretty scary.

So, to start off, what even is machine learning? It's math. It's just math. It's really fancy math, but it's not magic. It's just math that you could probably understand if you took like a bunch of classes and got a PhD, [laughter], but I definitely don't have that PhD. Most machine learning practitioners have no idea how this works from a mathematical perspective. So, it really can seem like magic, even though it's just the computer is manipulating some numbers in some ways that you don't understand. But what it's doing is it's finding patterns. You're giving it a bunch of data that encodes some of your hypotheses about some sort of pattern that might exist, some sort of pattern that you hope is meaningful. Maybe there's a couple of hypotheses in there. And that the answer is about what patterns actually do exist in the data that you have [and] are going to be useful to you in some way. For us as journalists, hopefully, that means that we found something out about the world that we didn't know before that the computer is telling us.

So, what is AI. It's the same thing. If you say, "Oh, we use artificial intelligence," what that probably means is you're trying to raise money. [laughter] Machine learning is just sort of what the mathematicians and the programmers call it. AI is what the marketers call it. There's a little bit of difference if you're like a philosopher. [laughter] For our purposes, it's the same thing. I'm going to say machine learning, because I'm a computer programmer sort of by trade. But if you're serious about artificial intelligence, just pretend that's the word I'm using.

So, how is it that your organization can benefit from machine learning? This is not my metaphor, by the way. I'm copying it from someone. I don't know who, but it's not my idea. So, imagine that you had unlimited interns. Think about your intern for next summer, your intern from last summer. Unfortunately, they probably had some sort of kind of menial task to do reading a bunch of documents, making a bunch of phone calls, and they probably impressed you with how bright they are. They did a really good job. They knocked the ball out of the park. Imagine that you had unlimited versions of that intern, except they can't make phone calls and they're not that bright. All they can do is that sort of menial task. That's what machine learning is. You're getting the computer to do some sort of really menial task that you could never get so many interns to do it, but it's just sort of reading a document and counting up the words or measuring some piece of data a gazillion times. You can't get a person to do that, but a computer will do it happily.

So, here are some examples, the real life examples of journalists using machine learning to help them do their jobs to break news, investigate, find the bad guy, that sort of thing. My first example is a story from about a year-and-a-half ago by The Atlanta Journal Constitution. They started off just looking at Georgia, because they're in Georgia, but they expanded to the entire United States. They downloaded all of these documents from all of these state medical boards, which published these documents about how doctors who are disciplined, what happened? What the

case was that they were charged with doing that got them to maybe lose their license or temporarily lose their license. And they found that a lot of these people had moved from state to state to sort of dodge these sanctions. And what they were most interested in was not the doctors who had been sort of doing something funny with their money or doctors who had been prescribing opioids to people they shouldn't have been or too many of them, but rather doctors who were sexually abusing their patients. But the problem was, you know, they had 50 states worth of bad doctor paperwork going back years and years. And so, what were you going to do? You can't have a handful of…. I guess there were four people's names on this story. You can't [have] four of your top-notch investigative people reading all of these documents for like an entire year. That would just be a waste of time.

So instead, what they did was they built a machine learning system to search through all of these documents to find…. It's sort of hard to read in this small text, but looking for — read through all of these documents looking for all of these words that might indicate that this was a sexually abusive doctor or might indicate that this was a doctor who was doing some other bad thing that was not super relevant. They trained a statistical model that says, "Oh, if you have all these words about genitalia or whatever, it's a lot more likely that it's going to be a sexually abusive doctor." And so what this was, was they would sort of separate — the computer was able to separate the wheat from the chaff, so instead of reading millions of documents or however many it was, they only had to read 10% of those or something like that, which saves them a lot of time. And they were able to do this amazing story that exposed a lot of really bad doctors that was really in the public interest.

So, my second example is from BuzzFeed. Peter Aldhous, who was mentioned earlier in a question, [is] a really great data reporter. I think, as was mentioned before, the code from this is on Github probably. They were looking for these aircraft that are connected probably to the government through some shell companies that are circling over American cities doing something sketchy kind of like surveillance. Maybe it's cameras. Maybe it's cell phones. Not really clear, but Peter was able to track down a bunch of these planes. The problem was, was that they had gotten a gigantic database of the flight paths of like every aircraft over the United States for a year. This is a huge amount of data with like the guy who flies on Sunday with the plane he built in his garage, you know, commercial airliners, rich people and bankers flying around, helicopters with medivac, and the TV helicopters. How do you separate out the actually sketchy airplanes that they were looking for from this gigantic massive data?

Again, you probably could have had interns go through and look at every single flight path. You know, is this a Delta plane? Is this some banker just flying from the Hamptons to Miami? It would have taken way too long. So instead, they found some way to represent each airplane's flight path. Some stuff about, how often did it change altitude? How much distance, start to end, did it cover versus the amount of linear distance that it flew? So, these sort of hairballs here, or, where it didn't cover a lot of distance over a long period of time? It was able to, again, separate the wheat from the chaff, in terms of finding which of the aircrafts' flight paths were

most interesting, so that a human could apply their knowledge to that and say, "Oh, this one really is a sketchy airplane."

Here's a project that I did. Had a gigantic database of press releases from Congress. And I used this machine learning tool to ingest all of these press releases of, you know, "We renamed the post office," or whatever it is, into a system that sort of learns a little bit about how English works. And you can compare the sort of average of all their press releases, the average of the words of each press release, to get an idea about what it means. And so, this system, without me teaching it a whole lot, just feeding in half a gigabyte of press releases, it was able to learn that Representative Paul Ryan cares a lot about taxation, which if you follow U.S. politics, he's obsessed with tax policy. So, the computer was able to learn this all by its own. Chuck Schumer, likewise, knows a lot about—or spends a lot of his time on transportation. But what you've got to be careful of is that what the machine—the computer thinks is interesting might not be what *you* think is interesting.

Using a similar tool to this, I compared a few years of ProPublica articles, which is where I work now, to a few years of articles from The New York Times, where I used to work, to see what was most distinctive about ProPublica's articles. I'd hoped it would be something like some topic of a ProPublica investigation. No. The most distinctive word from ProPublica compared to The New York Times is the word *spokesperson*. Why? The New York Times style demands that you say *spokesman* or *spokeswoman.* ProPublica allows *spokesperson*. It's sort of interesting if you're a copy editor, but it's not the like hard-hitting fact that I was really hoping for. So, you've got to be careful about that with machine learning.

So, I'm running out of time, but you probably already have some machine learning experts in your newsroom. They're in charge of your AB testing. AB testing is sort of rudimentary machine learning. And even more complicated ML techniques are being used to maximize your ad sales, your page views, these sorts of things. And I bet you that those people on your business side would love to spend a couple of Fridays teaming up with a reporter to find something really cool.

But here's what you've got to be careful of. People outside of your newsrooms are using sort of the combination of—really the combination of virtual reality and machine learning to create these really convincing fake videos. Here's a screenshot from The New York Times of Kevin Roose pasting his face onto some famous guy, I don't know, and generate these really—without a whole lot of effort—can generate these totally convincing fake videos and totally convincing fake audio. You can make President Trump or former President Barack Obama say whatever you want them to say. And it sounds totally convincing.

And I don't know of any examples of this fooling journalists yet, but like that's going to be coming, because it takes a couple of hours and 80 bucks to make one of these. And some of these trolls who were mentioned in yesterday's sessions are going to find 80 bucks somewhere and build one of these and try to fool you. And that's really going to be a problem, because you can't rely on the fact that it's a video. You can't rely on the fact that it really is audio, and it really sounds like it's a

leaked tape of Obama saying something terrible, because it might just be someone who applied these fancy computational techniques to generate some scary fake propaganda.

So, machine learning and AI. It's real useful for investigative reporting. Newsrooms are probably already using it. And you can get some impressive results if you have those people team up, but you've got to be careful of those scary deep fakes.

[Applause.]