

15th Annual International Symposium on Online Journalism

Day 1, April 4, 2013: Morning Session - 9:30-11:00 a.m.

Bots, Drones, Sensors, Wearables, etc.: The New Tools for Journalism

Chair & Presenter: Janine Warner, Journalist Turned Geek, Author and Teacher

Panelists:

- **Larry Birnbaum**, Professor of Computer Science and Journalism at **Northwestern University**; and Chief Scientific Advisor at **Narrative Science**
- **John Keefe**, Senior Editor for Data News & Journalism Technology at **WNYC**
- **Tim Pool**, Producer at **Vice Media**
- **Matt Waite**, Professor at Practice at **University of Nebraska-Lincoln** and Founder of **Journalism Drone Lab**
- **Nicholas Whitaker**, Media Outreach Lead at **Google**

Janine Warner: Larry Birnbaum earned a PhD from Computer Science at Yale in 1986. I think that puts him ahead of his time. He joined the faculty at Northwestern in 1989, where he's currently a Professor of Computer Science & Journalism. He's also the Chief Scientific Advisor at Narrative Science. If you don't know them, they're the makers of Quill, which is an artificial intelligence platform that turns structured data into actionable stories and insights. Larry said he will show us some examples of automatically generated stories, but his larger theme is how to apply human editorial judgment at scale. Larry, are you ready to come up here? Your PowerPoint should be on this laptop, and Ian will help you with that.

Larry Birnbaum: Yeah. Well, anyway, look. Yeah, let's go. So, here's the story. And we're not going to be able to do so much of the live animation. Not that there is that much of that, but this is an example of a story that is written from data. It's a story.... You won't see the data, but the data are from a hockey game played actually in Texas, and this is a story that's generated automatically by that. Okay. Good. And, of course, More than Sports. We do business stories. So, some of you may have seen the stories we do for Forbes.com. We do quarterly earnings previews based on data. We have experimented with medical stories. So, this is a story generated from what's called an Adverse Events Diary, which is kept from patients who are being tested in drug tests. Try not to get too flustered by everything that's gone wrong. Okay. Cool.

Civic data. So, this was actually something, I think, people would be more interested in as well. These are data from a project with ProPublica, where they helped us. Well, they did all the work really to get the data for 52,000

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schools in the United States. And we wrote 52,000 stories with them about each and every one of these schools. Basically, the editorial angle on these—I'm going to talk about that in a minute—where it highlighted the relationship between the academic achievement of the students in these schools and their socioeconomic background. And in fact, in order to highlight that point, what we did is we chose schools nearby that had rather different socioeconomic backgrounds and compared the academic achievements of their students. That was the point of that kind of story.

And actually, I'll take a little license. The company is not really doing this, but this is an experiment that we did where we used unstructured Twitter data around the Republican primaries that we then structured and analyzed to write this story automatically. And I think the first paragraph is a little boring, but the second paragraph, I think, is pretty cool. "While the overall tone of the Gingrich tweets is positive, public opinion regarding the candidate and character issues is trending negatively." And then there was a kind of cool excerpted tweet that actually illustrated that.

Why stories? I don't have to tell you folks this at some level, but, and again, without the animation, it's a little hard to see, but you can show people a chart of data, and you can show people a graph, or you can tell them a story that actually explains to them what it is that they're supposed to be seeing. I was at a big data conference a couple months ago and somebody said, quoting, I think, Chris Andersen saying, "The thing about big data is that the data will speak for themselves." I think that's absolutely not true. The data do not speak for themselves. We have to give voice to the data. There are stories in the data, but the data themselves are not, in fact, a story.

So, here's really what we do. We do what we call *narrative analytics*. We look for big patterns in the data that we think sort of embody humanly understandable themes. Comeback, fade, and low-hanging fruit is a good business theme. You know, what's the one thing I can do today to make my life better? And these themes, when you see them in the data, they kind of make the data real for you. They make it... They connect it. They make it coherent. They focus you on what it is that matters to you in those data. And that's really what our software does.

As I said, we originally invented this technology at Northwestern, actually about five years ago now, with some students. Actually, some Medill students helped us to build this technology initially. And we were very excited when we saw this. We felt we would forget about profits. This was all the reward we needed, was an XKCD slide thing.

And, of course, since then, the company has gone on to do a great deal of work primarily in financial data and financial stories. And so, although we do write stories automatically, they are published. Some with attribution and some without attribution. Primarily, at this point in the life of the company, we get proprietary data, and we write stories about those proprietary data,

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and we ship them back to the people who own those data in order to help them understand what they're supposed to be doing. So, for example, and here the point being that we can actually take very -- we can write stories for one person about their portfolio, for example, about their investment portfolio, and we can make them look pretty as they expect them to look.

We do a lot of sector reporting, stock market sector reporting, as you would imagine. This is something that I think is pretty exciting actually. We have data from a large fast-food franchise company, and we get a lot of point of sale data. They generate their... They are a highly automated company in some ways, and they generate a tremendous amount of data for their store managers, who really don't know what to do with it. And so, one of the things that we've been doing is experimenting with writing them a story, a weekly tracking report about how their store is doing and comparing how their store is doing compared to stores in their area. And what I'd like to say about the story is it's really boring unless this is your restaurant, in which case it's really not boring at all. OK?

And actually, one of the things that we learned when we were trying to write these stories [was], how do we actually give people something? You know, we started to think about how to be meta writers. How do we take the structure of a story and sort of blow it out at scale? So, what do you want to tell somebody, a busy person, at the end of the story? Which is, what's one thing that I should focus on this week that would make my life better? And that thing there is from the low-hanging fruit angle. It says, find an under-performing, high-margin item--under-performing compared to your peer stores--and point it out to this person so that they might think about whether they want to do something about that.

We've done work in education based on educational data. Here, we're providing feedback to somebody who's been taking standardized tests. This is something I'm really excited about and proud of. We partner with a company called Game Changer. They generate a tremendous amount of data. If a coach or a parent uses a smartphone to score the game, we get the data, and we write a story about it. And so, we write all these fantastic Little League stories every summer. Every day, really.

So here, I think I can do a demo, assuming I can. Let's see if this will work here. So, we just launched this product that I want to show to you. Just a second. Got it. So, one thing that the ISOJ folks were kind enough to do was to let me take a look at their Google analytics data. And so, this is from their Google analytics data. These are reports that we can generate automatically. And by the way, if any of you have websites and do this kind of analytics, which is probably most of you, please feel free to go to Narrative Science's website and try this thing out for yourself. It's free. And here is the report we generated for last week, which is a good report, as you can see. Things were up. I'm excited to see that visitors seemed to be more engaged with your ISOJ panel to explore new tools for journalists: bots, drones, sensors, and

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wearables. So, that's actually pretty exciting. Let me just close this up now. OK. Thank you. Now I have to find.... I'm sorry. [*A man comes to help him with the display.*] There we go. Thank you. I'm sorry I'm such a klutz.

So, I want to end on my actual sort of larger theme. So, the machines that we write, they use editorial judgment to write stories. You cannot take a wall of data and turn it into a wall of text. It requires some editorial judgment to turn it into a story that actually highlights what's important, that makes it real, that makes it meaningful. But if you go up a level, of course, machines are already making a lot of editorial judgments right now in terms of at the level of, what do we see? What information do we see? The order in which we see it. And I think there's a really interesting question as to, what are the editorial values that underlie these judgments?

So, these are two machines that are editors right now that a lot of people use. And I guess I want to make the point that I think it would be really great if the editorial algorithms that are being used and that will be used in the future are actually written in a way that people can actually understand what they're doing. Not only the people who use them, but the people who write them. And I think there's actually a problem sometimes where the engineers who build these things do not necessarily understand the editorial values that underlie their decision making, because it isn't necessarily the case that the parameters that they are taking into account are sort of humanly -- sort of correspond to humanly recognizable, editorial categories.

So, I think this is actually going to be a big challenge for the future is, how to make these things, in some sense, accountable, how to make them understandable, how to make them usable, how to make them sort of tweakable by people, adjustable. If not by the people who read the articles that result or read the content that results, at least by the people who are generating that content.

So, this is sort of a gleam in my eye, but this is something I'd love to be able to build in the future, which is sort of an interface to help you sort of parameterize, what kind of stories am I going to see? What will the mix of stories look like? Within a story, what kinds of tradeoffs will I make between, for example, human interest and data or context and brevity? Because these are really the kinds of categories in which people think when they think about making editorial judgment.

So listen, thank you. And I'm sorry about the glitches. I want to thank all my partners over the years and students, of course, and especially our wonderful funders: Knight Foundation, National Science Foundation, and Google. Thank you.

[Applause.]

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Janine Warner: Our next esteemed panelist, Tim Pool, is the head of Live News at Vice Media. If you've been hiding under a rock and don't know, Vice was founded in 1994, produces an HBO news show as well as the popular Vice.com website. Tim's unique style of interactive broadcast journalism exists at the intersection of social and mainstream media. I stole that from his bio. I just think that's so eloquently written. I might have to use it. As a producer for Vice, he's covered major events around the world in places like Istanbul, Cairo, Brazil. And he's known for pushing the boundaries of journalism by consistently using new technologies: live streaming aerial drones, mobile devices, and I believe he has a Google glass demonstration in store for us. His ground-breaking coverage of the 2011 Occupy Wall Street protest was picked up by Reuters, The New York Times, NBC, Al Jazeera. You'll see his work in many places. He was a nominee to Times 100 in 2012 and a recipient of the Shorty Award for Best Journalist in Social Media in 2013. It's my pleasure to bring you Tim. Thank you. Tim Pool.

[Applause.]

Tim Pool: Thank you. Man, that makes me sound really, really important, I guess. I certainly don't feel that way, but.... So, the first thing I'm going to do before I say anything is just hope this works. Because I'm told this is really cool. Let's see if it loads. How do we scroll down on this thing? There we go. [*Video plays.*] So, you might be wondering what you're seeing right now. You're looking at what my watch can see. So, this is my watch. And it's actually live broadcasting to the internet. Anyone in the world can see this. And that's why you can see my hand when I'm holding like this.

So, this is wearable technology. This is the Omate True Smart. And I think doing a live broadcast from a wearable device sort of sets a good standard of how powerful it is. This particular watch has its own SIM card. It can run HSP Plus. We call that in the United States 4G. It's not really 4G, at least not for the rest of the world. But I play with gadgets and gizmos. As you heard before, I do live news, and I'm also a host for Vice Media.

The Google presentation, I was laughing, because they used one of the docs that I worked on. But I wanted to start by talking a bit about wearable technology, what I think about it, and what I think about Google Glass and smart watches. When the smartphone started getting popular, particularly with the iPhone, when you had this interface that allowed you to easily access the internet, when cellular technology started getting to the point where we were getting over a megabit download rates--so this is CDMA technology or the iPhone 3G--all of a sudden, everyone could go on the internet anywhere, and that was revolutionary. I don't hear people talk about it enough. Because before that, you could go on the internet when you were at a computer, at a café, your laptop while you were at home. And then with mobile, everyone can just go on the internet whenever. They can tweet. They can do whatever, wherever.

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So, I think wearable technology is trying to do that again. But I'm not convinced that it's going to. We hear a lot about Google Glass wanting to be the next step in connectivity and get you over that -- you know, get you more up-to-date information. The quick things that you need to see, but you don't need a phone for. Smart watches, same thing. It's a level of convenience that I don't feel pushes the boundary enough to make you -- to make it actually worth getting. So, I've used a smart watch for a lot. You know, it's kind of incredible. This is a fully functioning Android cell phone. I can make phone calls on it. I can visit websites. But I can do that on my phone.

With Google Glass, there was a really good question. So, I used Google Glass last year in Turkey during the Gezi Park protests; primarily, because to me this is all research. All the gadgets and everything that I work with, it's researching, what can I do with a new piece of technology? How far can it go? And I've duct taped some crazy things together to make crazy things happen.

When I looked at Google Glass, the first thing I thought was journalism. It's probably the best use case, at least in my opinion, because if I need a high definition photo, if I need to take a picture or a video of my friends, there's no reason I can't pull up my phone and just... I don't even know where my phone is now. Well, I lost my phone. It's on the floor? Oh, it's on the floor. OK, well, that's fine. See, I even lose it because I'm so... All good. You can easily pull out your phone, adjust the device, take your picture, and it's good quality. So, the difficult thing with Google Glass is that you can't align the photo before you take it. You take the picture and then it shows you what you've gotten. The quality is a little bit... It's a 5-megapixel, 720p, so it's relatively good. But I thought, you know, what profession? What task? You want to get the information as fast as possible. Send it out as fast as possible. And the quality is less important than the content. And that was Google Glass.

So, you know, I'm in Turkey, and I can take a photo within a split second by just saying, "OK, Glass, take a picture." It happens. And then I can tap 'share' and it's out. It doesn't need to be the most beautiful picture in the world, because what I'm trying to do is tell people what's happening. So, that to me was the best use case. I was really excited for being able to do live broadcasting; however, you know, we discussed earlier, it overheats very quickly. But it still seems to be really interesting to a lot of people.

The one thing I will say just as I move away from wearables, just to end it, there's an app called Word Lens for Google Glass, and it's actually on iPhone as well. And you can point your camera at an image of text and it turns that image in a foreign language into English. So, when I'm looking at a sign in Spanish, I can say, "OK, Glass, translate." And when I look through Glass, I see English. So far, that's the most revolutionary thing that I've seen with it. I think when more software comes out it's going to be -- I just can't even

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imagine what's going to happen. When I was in Brazil, when I was in Turkey, I used it primarily for instant translation, just so I can stand there and say, "I need this word right now." But wearables are fun. I still think smartphones are much better for now, but I think there's a software problem.

So, the next thing I wanted to talk about is, for me, what I started -- what got me into all of this, the tools and the access, was a Samsung Galaxy phone. One of the first devices with touch interface similar to the iPhone. And I was able to post photos, videos. I was able to tweet on the ground in New York during Occupy Wall Street. And I was also able to do a live broadcast just with a smartphone. So, there was a moment where I was in... Michael Moore wanted to do a live interview with MSNBC, and they said, "We can't get close enough to the Stock Exchange, because we have this huge truck and the satellite dish, so this is all you have." And I went, "Oh, actually, I'm good." I'm holding up a phone. And Michael was like, "Cool, let's go do it." So, I just with my smartphone was able to go down there, and he chose my smartphone over their big, bulky truck. Granted, the quality wasn't that good, but it's the connectivity. It's the software of mobile that I think we haven't seen the full potential of yet.

So, I am actually working on new tools, new software for journalists. And I think one of the issues is that we have a really, really powerful little computer in all of our pockets, and there's still a lot of people using laptops, but smartphones can do most of this. I think the issue is, it's an interface creating a way that people can easily do the task they need to do. When I look at mobile technology, I'm not convinced we have the best software yet. We have all of these different social platforms that all do very similar but slightly different things, and it seems to be based off the popularity of the app and not so much the entirety of the tool. But I'm looking at how powerful an Android phone is and I'm wondering why we aren't using it for more.

Let me pull out something for you guys here. This backpack is full of crazy gadgets and gizmos. But this box right here attaches to any camera with an HDMI output, and it's a live encoder. So, I can take a DSLR. I can take any camcorder. I can plug HDMI into it and broadcast live. This thing does it all. It's the Livestream box. And it's really, really great. But I can do the same thing with my iPhone. I can use my Android or my iPhone to do a live broadcast as well, but there's the software barrier. Just for whatever reason, we aren't pushing hard enough.

So, I don't want to talk too much about this next thing, and then I'll lightly go over some drone stuff. But in terms of software, I'm working on many, many different things. This is one of them. One of the problems that I've seen with social media—and there was a big lawsuit about it—is context and ownership, copyright for media. So, I'm working with a few partners to create an app. It's done. It will be launching soon. This is going to allow you to with one touch have your any text field, your location, your timestamp, and a logo into your photos. So, the average app that allows someone to do

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this takes seven taps, and that's why no one is doing it. So instead, photos are being ripped, stolen. Companies are sending out journalists all around the world, and the photos are going viral, and no one knows where it came from. I mean, most people don't care except for that company that just put \$100,000 budget into going to cover breaking news, and no one knows it was their reporter that put it out there. So, when I look at social media, I think more often breaking news and the news people want to get is going to come through these channels and not necessarily through websites.

Everyone is talking about the cool new websites they're doing with the cool new technology, but I still primarily get my news from Twitter and Reddit. So, what I'm trying to figure out is, how can we answer that question? When you can answer the question, why would someone rather go to a social network than to your news website, you'll have a really good chance at becoming the next big network. But until then, I'm working to make sure that we can provide real value for the companies that are investing in this. That there is some way we can have social media be a real platform for news and actually have something that's tangible, that a company can say they get real value from.

And the last thing that I just wanted to lightly talk about is, drone stuff, before Matt come up and flies it and impresses everybody. The one thing that I always want to get across with drones is that we always see the flying ones, because they are the coolest, but there are underwater drones being used for monitoring. The best example is the tuna drone. It's wired and it goes around and it swims around hulls of ships looking for damage. There's ground drones. So, I've actually played with the Rover. I don't know if Matt's familiar with it, but it's ground based and it's got a little swivel camera. But the thing that seems to be the coolest for everybody is the flying drone.

And so, the last thing I want to say is, again, thank you, everyone, for listening to me, and thank you for letting me be here. But you'll get a lot more out of me by just coming up to me and asking me more direct questions about the slew of gadgets and gizmos that I have in my backpack, which I can more specifically focus on what you guys want to do. So by all means, come talk to me. And if you want to try Glass, I'll go do it. But without further ado, let's fly some robots.

[Applause.]

Matt Waite: [*Holding drones in his hands.*] I just want to say starting out that by blinking your eyes you have indemnified me to any and all legal problems that may occur. [*laughter*] If you lose a face, I'm sorry? I really am. [*laughter*] But before we fly it around, I'm going to torture you for just a few more minutes. I want to show you [*that*] what I have in my hand is essentially a \$500 constitutional challenge in a box. [*laughter*] The DGI Phantom.... Actually, there's a Phantom 1. You can get them as low as \$350 now. You throw GoPro on there, you have a pretty great platform for video

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and photos. The problem is you have a really great platform for videos and photos and something that you can go buy off the internet. Now, if you are sitting there and you realize, "Hey, I have any one of the hundreds of used Apple products staring back at me. I have a credit card. We have internet access. I am going to go buy one of these," slow your roll.

Let's talk about this for just a moment. These are presenting all kinds of really interesting problems for journalists, for federal aviation regulators, for state legislators, and unfortunately, I think the next five years are going to be some of the most litigious that we're going to see in terms of new journalism tools. And it's somewhat fantastic that I'm doing this in the state of Texas, because I would like to welcome you to Ground Zero for the first constitutional challenge that will emerge from drones. Last legislative session, the great state of Texas in its infinite wisdom decided to pass a law, and its governor, Rick Perry, signed it into law, that if you have one of these and you fly it more than eight feet in the air—which I got about 6'1". My arms are not that long, but really about [no] higher than this. [*stretching his arm up above his head holding a drone*] Anymore higher than this, and you take a photograph of somebody and their private property or their private property without their consent and you post that photo on the internet or you distribute it in some way, guess what? You've just committed a misdemeanor crime.

So, if I take this device outside, I go on the other side of the river to an open piece of ground, and I take off and I fly to just ten feet, and I take a picture toward downtown, a picture I'm sure The Statesman has taken a thousand times this year, a picture that has been taken tens of thousands of times before just of skyscrapers, if I wish to use that photo from this, I now have to get consent from every visible building/land owner in the picture. As a journalist? Yep. As a private citizen? Yep. But thanks to effective lobbying, if I am a real estate broker? Nope, I'm good. [*laughter*] I'm fine. If I am an oil and gas pipeline owner? Fly on. Have a good time. But if I am a journalist covering an oil and gas pipeline explosion, I am committing a crime by using these.

I am not a lawyer. I don't pretend to be one. But I have lots of friends who are. And they are like, "No. Huh-uh. This is not gonna stand." Actually, I get phone calls fairly regularly from lawyer friends who are like, "Will you please go down to Texas and get arrested?" [*laughter*] And I'm at a stage in my life where I'm sitting there going, "Ehhh...I could do that." My wife would be pretty pissed at me, but eh, I'm not gonna get fired. In fact, my employer would probably think that's pretty great. God, I love academia. "Go get arrested, man. It's fine." So, because basically the first person who gets arrested under this, it's going to end up as a court challenge, and this law is going down. I'm fairly confident. The problem is that state legislatures seem to be basically a grown-up version of high schools. And so, there's a fad going around now of other states getting into this business of trying to

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regulate drones in advance of the FAA. And we haven't even gotten to the FAA yet.

Georgia literally copied and pasted Texas's law and introduced it. They made one change. One. Texas law has 19 exemptions to "It's illegal to photograph from a drone." 19. Georgia only has 18. The difference is that Texas makes it completely legal to fly drones and photograph whatever you want within 25 miles of the border. Georgia doesn't have that problem. Unless it's with Florida, which, you know, totally understand. I would monitor the border with Florida myself. Copied and pasted, word for word.

Four other states are considering laws. The most current one is in Washington, where that law has been passed by the legislature. It's sitting on the governor's desk. It, too, has some constitutional dubiousness to it. If you are in a state here in the U.S. and you are interested in using these things, you should be watching your state's legislature. They are moving far faster than the FAA. Far faster. And they are doing things that appear to be fairly hostile to the First Amendment.

Now, I saw that. First Amendment. I have a lot of journalist friends who want to tell me that I have an absolute, unfettered, unquestioned First Amendment right to use these. And my immediate answer is, "No, you're wrong. You don't." And here in a second when we turn it on, you'll understand why. This thing right here is the modern robotic equivalent of shouting fire in a crowded theatre. Constitutional limits to free speech generally are okay when there is a public safety—I lost the word—public safety reason behind it -- that reasonable place and time restrictions are permissible. And with these blades, if you come up here afterwards and just kind of rub your finger on them, you'll realize pretty quickly they are sharp. And when I turn it on, they're going to spin really fast. Fast enough that if I were to put my finger down in it, I might not get it back. I might go home with nine fingers. I believe we call that *bad* where I come from. They crash. They crash fairly regularly. It's not always the pilot's fault, but as someone who has crashed many of these, it's often the pilot's fault.

There is a significant safety concern here. Actually, Tim and I were talking about this last night, that a lot of times when he's at these protests, there are so many people around, it's not safe to try to launch one of these drones. There's too many people. If something were to go wrong, someone's gonna get hurt. And you don't want that on your conscience. You don't want that. So, I may joke that you have all indemnified me by blinking your eyes, but I'm going to try very, very hard not to mutilate you in some horrific fashion. [*laughter*] It's—it's—it's not only a bad idea, it's pretty career limiting.

So, that's the issue the FAA is actually most concerned about. They're probably overly concerned with safety of people in the air. They're worried about knuckleheads crashing these into United Airlines flights. And I'm here to argue that that's not even close to what we should be concerned about.

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It's actually people on the ground. These things fly low. The cameras that we generally put on these things you don't want to go way, way, way up high and intermingle in the same air as Delta or United or US Air or whoever. You want to stay low. In that case, I get asked every day almost, "When are you going to go cover a Husker football game?" A few of those of you who are unfamiliar, we at the Harvard of the Plains, we have a small, intimate gathering on Sundays, or Saturdays in the fall. 90,000 of my closest friends. We get together. We cheer on our young lads. We sort of care about it. People ask me all the time, "When are you going to go fly over that crowd? When are you going to cover a football game with them?" And I said, "You know, I'm not going to do it until I can be pretty sure that I'm not going to injure one of my 90,000 closest friends."

The FAA is concerned about that, but the FAA is also losing ground on actually getting to regulate these things. The FAA is going to -- is supposed to have proposed rules a long time ago. And they keep delaying, they keep delaying, keep delaying. At the same time, technology like this becomes more and more available. Outside with GPS assistance on this thing, this thing is cake to fly. If we wanted to go and have a drone boot camp, I could get you pretty good on flying these things outside with the GPS controls in three hours, four hours, tops. You could be doing journalism with these things midday. Maybe we stop for lunch. Maybe we don't. They're really good and they're really cheap. And the longer the FAA waits, the less people are going to stand around and just go, "No, okay. We'll wait. We'll wait for you to come up with rules."

It's already happening. Two times within a week in New York citizen journalists grabbed these things. There was a building collapse in East Harlem, and they went and took off and flew over it with a camera. I'm just going to do this real quick. [*gets the drone ready for flight*] Everybody wave. [*sits the drone on the floor and gets the controller*] And they went and they flew over this building collapse. And they got pretty amazing photos. And they got some amazing things that helped the story. A week later, there was a fire at a recycling plant. Somebody did that. They weren't journalists. The FAA has taken a very dim view and, indeed, are investigating these folks...dubiously, but that's a story for another time. There are no real rules on how to use these. There are no safety standards. There are no licensing standards. There's no insurance requirements. There's no nothing. You can buy these off the internet [and] be in the air within the afternoon. Out you go. That's not a situation that can continue. We're going to need rules of the road or someone's gonna get hurt.

And I'll show you just a very brief demonstration of how this is both wonderful and semi-terrifying all at the same time. So, I unlock the rotors, and they're just spinning at kind of a stay state. And off we go. [*flying the drone over the audience*] And I love high ceilings. If y'all are a little warm, I've got you covered. Because when the fans get going, you'll feel it. Now, if I'm outside, this thing is actually much easier and safer to fly, because the

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GPS would be helping me out. In here, it's all my controls. So those of you in the front rows here, you should be a little bit nervous. *[laughter]* So, you can see right away why this might be interesting. If there's a building on fire in front of me, if we're at the scene of a tornado that's just wiped out a town, if we're covering a hurricane in Florida, we've got a pretty ideal platform for some pretty unique views on this. *[returning the drone to the stage]* If we were outside, I'm only a criminal in the state of Texas. The FAA is gonna be sending me little nasty notes. I have one. I didn't bring it with me. I should have. *[keeps the drone in front of him hovering]* But you can see, you can hear it. If I go like this—*[reaches out to touch the drone]*—bad news. *[lands the drone on the stage]* *[Applause.]*

Rosental Calmon Alves: We survived.

Matt Waite: First view of safe drone flight is nobody dies. *[laughs]* Just make sure this thing is not going to fly off on its own, but....

Woman in audience: Has it ever flown off on its own before?

Matt Waite: This one has not. We have others that have had a mind of its own before. We have one that's actually on the bottom of the Platte River right now, because it decided to commit seppuku. *[laughter]* But actually, it did exactly what it was supposed to do. It went and it detected an electrical anomaly on board, and it decided to go into an emergency shutdown, and it just decided to sit down in the middle of a river. So, it's a very dumb smart technology.

Janine Warner: Our next fantastic speaker hails from Google. Before joining Google in 2010, Nicholas Whitaker spent a decade producing, directing, editing, and shooting thousands of videos and images for news, commercial, entertainment, and advocacy media. Today, he leads the outreach and training for the Google media team. And he spent the last year meeting with more than 5,000 journalists in more than 30 countries and talking to them about how they use technology, what the trends are, and the tools they are using. And he's here today to share some of those findings with us. How are you guys doing over there?

Nicholas Whitaker: I think we're getting close.

Janine Warner: All right. Take it away, Nick.

[Applause.]

Nicholas Whitaker: Hello. How are you? I think a million-dollar idea would be a PowerPoint presentation system that worked for everybody universally. *[audience reacts]* I spend a lot of my time actually traveling. As she mentioned, I travel around the world these days. And I have a little bit of tech envy, I think, for this particular panel. I don't have anything that blinks.

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I have a laser pointer that kind of works. But, you know, really what I do is I travel the world training journalists. I wouldn't even really say that I'm a journalist anymore myself. I was always kind of an entrepreneur. I was a videographer or a predator, as we were being called for a little while there. But, you know, what I've really been moving into these days more than anything is education. And since I've started my role at Google over the last several years, we've really expanded. You know, we started out teaching geo-tools, so Google Maps, Google Earth. I had to integrate those in a broadcast, so we kind of broadened that out over the last couple of years to incorporate a wide swath of all the different tools that are available for journalists.

So, the team that I'm on is called the Google for Media Team. We're based across a large area of the U.S. My colleague, Vanessa Schneider, who's kind of the expert now on Google Maps and Google Earth, she's based out of California. My boss, Daniel Sieberg, who some of you may know, is based out of New York City. And I've recently expatriated out of New York City, because I, too, was curious about how much I'm sleeping, so I actually moved to Boulder, Colorado, and that's where I'm based out of now.

We're focused on education. We're really trying to inspire journalists to use our tools, use them more effectively, and use them within the ecosystem that they're already using other tools at. I mean, just a quick show of hands here. Who uses Google to search? Yeah, so, a lot of you. You know, and the idea is not so much, are you adopting tools that you haven't used before, it's, how do you use tools that you're already using more effectively or in a more professional way? I think we're somewhere close to about 5,000 or 6,000 journalists that we've trained so far in the last two years across 30-some countries as she mentioned.

I just came back from Southeast Asia and the Region. Journalism is changing, and it's changing in very interesting ways, depending on where you're at in the world. We're really just trying to find ways to reach out to journalists. Trying to find ways to give them new tools to help them do their jobs more easily. We created a website, Google.com/mediatools, which we've actually regionalized, so it's available, I think, in 76 different languages now. Something along those lines. So, you can go to your region of choice. You can find media tools and find it in your language. We also have a Google Plus page, plus Google for Media, and a lot of tips and trend examples from journalists around the world. So, if you're creating stuff with our tools, share them with us. We'll share them with other people. I think some of the best ways to learn is to see how other people are using technology and, you know, borrowing from some of their ideas. And we're linking with other teams within Google, like the Google Ideas Team, which have created this suite of tools called the Investigative Dashboard, which I can talk a lot more about in our lunch session if you're interested. We're going to be in the Capitol Room during lunch. We're going to be doing a little bit of office hours. So if you have questions about Googles tools or if you just want to kind of

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pick our brain, that's a really good opportunity. Me and my colleague, Maddie, will actually be there to talk a lot of that.

In addition to the newsroom visits that we do, where we're actually going to individual newsrooms and training small teams, graphics teams or editorial teams, we also do the Summit Series, which I think we're on our sixth summit now. The most recent ones in San Francisco and Los Angeles. We have one coming up pretty soon in Washington D.C. And the idea behind that is not to sell product and not to really get people to use our tools so much, but to provide a space of learning and a space for interaction. So, the first half of the day is really spent doing thought leadership, panel discussion, and keynotes about local journalism and what people are doing, and then the second half of the day is digging more into Google's tools and teaching people how they can actually use those tools for the work that they do.

I mentioned the newsroom business. This is a small selection of some of the—it looks a lot more impressive when the screen is full screen—this is some of the locations we've gone to in the last few months. And again, and I think we'll probably talk a little bit more about this when we start getting into the panel discussion, you know, journalism is very different around the world, and people's experience with journalism with new technology is very different. And I think that's one of the most exciting things for me is going to a place like, you know, Vietnam or Cambodia and seeing how they're using social media, you know, and what that means for them from a storytelling capacity.

You know, we have a wide range of different people that we're talking to, big and small. I think some of the most exciting news groups that I talk to are not necessarily the big tier, very large groups, but some of the local affiliates. You know, people that are really innovating. People that are really trying to push the boundaries because they have to stay relevant. A lot of the lessons that we've been getting from here is, you know, people are excited. You know, they want to learn, and they're afraid as well. You know, a lot of people are being confronted with new technology, being confronted with new opportunities, and they just either don't have the skills or don't know where to find the skills. So, it's a lot of what we're working on is trying to make that easier for people to find.

There's also a huge opportunity for what we're called *the entrepreneurial journalist* or just *entrepreneurialism*. You know, so finding ways to get your message out there, finding new technology. Finding ways to make money off that is possible. And the barrier for entry is getting lower and lower all the time. I think that there's a lot of additional -- aside from the media tool site, there's a lot of additional resources that are available to new journalist or even an old journalist who's trying to learn new skills. And those opportunities are available in ways that they weren't available, say, 10 or 15 years ago, because of the internet.

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And we're also taking a look at core groups that are really pioneering a lot of this work. You know, with data visualization, investigations, and tools like Hangouts and even Google Glass, and mobile technology. Who has a smartphone in their pocket right now? Yeah, pretty much everybody. You have a mobile production studio in your pocket if you just know how to use it correctly. Figuring out ways to capture information from the field and then send that back or send that to your audience immediately. That's how breaking news is going to be covered in the future, I think.

Additionally, we have our own Google tools, which is something that we highlight quite a bit. Google search, you know, as we got a show of hands [for] everybody that's using Google search here. Also, Google Trend is available. A lot of different tools about how to use these particular products as a professional as opposed to an average user, that's really what we're all about. Also, you know, people are taking advantage of Google Maps. So, maps engine, maps engine light, fusion tables, and a lot of different products built-in within the Google maps section to help visualize information or get your story out there. The Google maps API. So, if it's not -- if you want to be able to change the background or if you want to be able to add additional elements or make it even more interactive, the map's API allows you to do a lot more with that.

There's a tool called Crisis Response, which I could talk more about in our lunch session as well. When a crisis happens, how do you get information to the people that need it the most? How do you provide that in a way that's easy and visual? You can do this as a journalist yourself. You can take advantage of Crisis Response tools to be able to get people the information in your region in times of need.

In addition to that, Google Earth. You know, I come from a broadcast background. I'm a visual person. So, my big mission has always been, how do you integrate these tools into existing workflows? How do you get somebody who's using a content management system to be able to use things like Google Earth to help visualize information? We're seeing journalists around the world being able to do that. Here's a good example of the Washington Post. This is actually Google Earth imagery that they took. They chopped [it] down and then put it into an interactive visualization online.

And then you get other people working with things like Google Plus and Hangouts. Again, I think, and this is me partially taking off my Google hat, but I think that things like Hangouts and this interactive component that Hangouts has, is really kind of bringing that promise of the internet alive. You know, the promise of the democratization of media. We all have the ability now to interact with our audience and engage with our audience, or more importantly, bring the voice of our audience into that discussion and make them part of that journalistic experience. And we're seeing people do that now using this platform.

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Then, of course, YouTube. It's not just skateboarding dog videos and cute cats. It's also journalism. It's also news. Finding ways to be able to take advantage of that. Oh, look at that, our fellow here from Vice Media. A good example from the Ukraine here. This is breaking news. It's relevant information. This is a platform where people are participating in it. And I get the question a lot of times, like, "Well, how do I get more people to follow me on YouTube? How do I get more people to follow me on—?" You know, name the social media platform of choice. And I think the key there is engaging with your audience. Giving them the opportunity to interact with you. And there's tools that are available with that.

Because it's not just about output anymore. It's about interaction. It's about engagement. It's about bringing people into that conversation [and] making that a live environment. I think the Bill Nye example that just happened recently. I don't know. Did you guys see the Bill Nye Hangout? Some of you. It was really kind of inflammatory interaction between the two people that are on that Hangout. Actually, it was really civilized actually. But the comment thread was, I think, one of the most engaging components of that particular experience. And I think a lot of times we neglect the comments section on our websites and within social media. But I think in all honesty, I think that's a lot of where journalism is happening is within that comment thread.

Then, again, new technology. Where are we going with that? Things like Google Glass, like Tim's got right here. I think there [are] possibilities there with using new mobile technology or wearable technology as a news capturing method. The technology is not necessarily perfect yet, but I think it's getting there. I think the more we can adopt these new techniques or these new tools and try them out, you know, like even drones as we're going to be talking about later today. And I think these are really powerful tools to help shape a story. So just figuring out ways to use those and incorporate those into our existing workflows is kind of the key.

Again, the website that we're going to be talking about today [is] Google.com/mediatools. It's broken into a few different sections. Gather and Organize is really covering the search and trends components. How do you organize yourself? How do you organize data in a way that's useful? The Engage section is really about, you know, YouTube and Google Plus and these other tools that you can use to get your message out there. Visualize and Publish, it goes into kind of the whole suite of tools that Google has that might be useful to you. Definitely, you should check it out. Also, our Google Plus page. Plus Google for Media.

As you're coming across these sites, if you have questions, if you have comments, if there's ways to make these sites more useful to you, get in touch with us. One of the big things that I'm going to be working on in the next several months is creating online training and linking up these tools with

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other people who are already creating online training modules to provide this information to you in a more useful way. So if it's not useful, let us know so we can make it more useful for you.

And that's all I have. So, thanks.

[Applause.]

Q&A Session

Janine Warner: Let me start with our first two presenters. Just some quick questions to get us going. I'm very interested in this idea of automated stories, especially after the earthquake last week in Las Angeles when the L.A. Times automatically generated a story where the sentence was kind of already written, but they filled in the blanks with the location and the Richter Scale number. That really hit me personally as an Angelino. I started to appreciate how automated stories have a pretty valuable place. Do you know how many newspapers like the L.A. Times are doing that or how prevalent that is?

Larry Birnbaum: To be honest, I actually don't know how many are being published. I mean, most of our stories are not being published. This was going into private circulation for the people who cared about those data. But I thought that was fantastic absolutely. And I think there's a lot of low-hanging fruit there. I mean, I want to be clear [that] the technology we build is not that kind of mad libs technology. There's a lot more going on under the hood in terms of how to organize what you're going to say and how to say it. But really, I love that stuff. I think it's great.

Janine Warner: It's a simplistic example, but I think most people can relate to it right away. Go ahead.

John Keefe: One of the most innovative bots or automatic news things that I've seen lately is the New York Times Fourth Down Bot, which actually comments on whether or not a coach should have gone—according to statistics—to go for the fourth down in American football. And we had a little spinoff of that. Somebody at WNYC, Noah Veltman, couple of weeks ago, made the Nail Biter Bot, which actually tweets out in an NCAA basketball game if it's within 8 points in the last three minutes of a game. So, you can look at -- follow Nail Biter Bot and it'll let you know. But these are computers who are letting you know about news in the world, whether it's earthquakes or sporting events.

Larry Birnbaum: I think it's exciting how a computer is second guessing us anyway.

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Janine Warner: Do you think we'll see sensors on people? Could we put a sensor on the President to find out his health status? Could we put a sensor on journalists in war zones to find out if they're okay?

Larry Birnbaum: That's actually already going on.

John Keefe: Yeah, right. The good part of that is, yeah, there's no question. I've got, what, at least, not including my phone, I've got two others on me already. Yeah, sure. You know, obviously, that raises a whole lot of issues, and issues that we deal with all the time actually when we're thinking about these things: about privacy, about where you are, about security, of course.

Janine Warner: Absolutely. I'm going to open this up pretty quickly to the audience, because you're a room full of journalists. I know you have a lot of questions. So, anybody who's got a mike, if you want to line up somebody with a question right away. I'll just ask one more of the drone guys. Internationally, can you talk about the laws around drones, since that is such an issue here? Is that as much of an issue in other countries as here?

Tim Pool: There's a lot of countries. I know that the drone laws in Europe are very similar to what they are in the U.S. And in the countries where the laws are a bit more ambiguous, I was in Turkey last year. I wanted to bring my drone. I didn't. And the person who did got it shot down by the police. So, over a crowd, and the police fired plastic bullets at a drone, knocking it from the sky. And that's the risk when you're in a country that's kind of, you know....

Janine Warner: I understand.

Tim Pool: Flying robot. It happened in Russia too. They shot at another octocopter in Moscow.

Janine Warner: I'm not surprised to hear that. Personally, I think they should have more cameras and less bullets on drones.

Matt Waite: To expand on that, the U.S. stands alone as being the only country where it's civil aviation authority just says "No. The answer is no, you may not do this at all?" Canada has rules that will allow you to use them under very limited circumstances. The BBC has a drone unit in their global services unit. They have two licensed pilots under UK civil aviation authority laws. They don't use them very much in the UK. They go to other countries. Parts of Scandinavia, parts of Europe have laws that will allow it, but all under very, very limited circumstances. Australia is actually one of the furthest down the road on this. They actually have drones that are flying over Australian rules football games. Like, the wire cams that you see in U.S. stadiums? They do that with drones. And the weird thing to me as an American is that the civil aviation authority in Australia, CASA, will not allow the drone operators to fly over the crowd. They have to stay five meters in

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the field. But over the really, really expensive professional athletes, "No, go ahead. Just fly all you want." And I'm thinking of, how much insurance am I going to need to fly over a \$120-million quarterback? And not only, how thick an armor on the car do I need if I were to clip that \$120-million quarterback during a game and knock them out? I would need a tank to get out of town.

Janine Warner: And don't take out any soccer players.

Matt Waite: Oh, no, no, no.

Tim Pool: While we're still on drones, a friend of mine and I have been working on drone projects for the past several years. And I guess the question I always ask as I play with these things is, why do you want to use rotor-based drones when we could just use lighter-than-air balloons?

Matt Waite: Mm-hmm.

Tim Pool: So, what we're actually looking at GPS, 3G and 4G data connection, using a blimp with a camera so we can get several hours of airtime, but using a cellular network, so it can be controlled anywhere in the world. It just seems like a balloon is going to be much, much safer than...

Matt Waite: It is...uh, unless it's windy. Then you've pretty much got to lasso that thing down somewhere to keep it from flying away. And that's always been the problem for me. I mean, I'm in the Midwest, so a light breeze is 15 or 20 miles an hour, and most of the glider airships would just be in the next county. So, balloons are another thing. The Public Labs are doing really interesting things with balloons and balloon mapping. But they have to tether them to the ground to be able to make that work. There's all kinds of really interesting stuff. Actually, for my purpose, like, my background is as a data journalist, and I'm interested in using these things for gathering data and mapping, and even like LIDAR and multi-spectral imaging and things like that. And for that, you want fixed-wing aircraft and they stay aloft for as much as an hour. It's just a much bigger challenge to be able to do that. And I can fly this inside. I can't fly that fixed-wing inside here...not without hurting anybody.

Janine Warner: A quick question for Nick before I take the audience. Is Google thinking about integrating with some of these cool sensors and drones? Anything you could share with us?

Nicholas Whitaker: That's pretty far outside my pay grade. *[laughter]* So, I'm not sure I could actually.... I hope. That would be interesting. But yeah, I don't know.

Janine Warner: I'm sure it's coming soon.

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Matt Waite: Maps and earth have actually worked with Public Labs on some of their mapping projects and pulled it in there. They've been able to supplement the image layers that they have used for their different products, and they've some of these Citizen Science based imaging projects to bring in really high resolution stuff on a given spot.

Janine Warner: Fantastic. Thanks, Matt. OK. Where's my first question?

Chip Stewart: Hi. I'm Chip Stewart. I'm a professor up at TCU and a lawyer. So, I'm just thrilled to be at a discussion about law. *[laughter]* I just want to say, plus one to everything you said. We do need to be challenging these and watching our state legislatures. Grave damage being done to the First Amendment. One of my concerns here is not just the legal, though, but the ethical.

Matt Waite: Yes.

Chip Stewart: Particularly as a journalist. And you mentioned some safety concerns there. What are some of your concerns regarding wearables and drones when it comes to, say, private property, citizens, the rights of privacy, and doing journalism?

Janine Warner: Go ahead.

Tim Pool: The first thing I want to say is this whole Google Glass privacy debate that has dominated the press, it's BS, man. It's total...

Chip Stewart: Another plus one.

Tim Pool: You're wearing a camera on your face. Yeah. You're wearing a camera on your face that lights up and you have to tell it to take a picture. It's much easier for me to take a picture with my cell phone and my watch apparently. So in terms of drones, and I'll definitely defer to Matt for this, there's a story of someone who flew an air drone parrot over their neighbor's backyard. And so, they had to build a big fence. But the argument that the person with the drone said is, "If I built a staircase to my garage, I could see your backyard anyway. I could take pictures with whatever. So, why is a drone changing this?"

Matt Waite: And I'll pick up on that. The courts have generally agreed that the First Amendment gives us a right to photograph in public places, which is why we can walk outside here on the street and we can take pictures and we don't have to worry about anything. Nobody has an expectation of privacy on a public street or anything like that. Where I think these.... When I called them a constitutional challenge in a box, where it gets interesting is, how far into the air does that right to photograph in a public place extend? Where does it go from being a public place to something else? And even if you are on a public street, I mean, it's simple geometry, basically, to figure out how

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high do you need to be before you can see into somebody's back yard. There's a lot of laws that are going through state legislatures right now. I think three of the states are considering them -- are predicated around private property. That if you fly over somebody's private property and take a photo, you have committed a crime. One of them is civilly actionable. But with multi-rotors, I don't need to fly over your property to see in it. And not only that, I don't need to do that at all, I have Google Maps. They do a pretty bang-up job. My garden -- I can monitor my garden in my backyard through Google Maps pretty easily. It might just be that we've gotten image updates a lot lately, but it's not -- you know, your backyard is not really that private if you think about it. But there is some comfort in this idea of, "I don't want the flying spying robots flying over my ground." And honestly when I talk to community groups, one of the first questions I get is, "Can I shoot that thing with my shotgun?" [*laughter*] And I always tell them, "1) actually, the law is not terribly specific on that, [*laughter*], 2) please do not put bullets into the air if you don't know where they are going to come down. Let's just stop there." So, very, very interesting, capital Q, Questions about the extent of our ability to photograph in public places.

Janine Warner: And we're going to end on that note then. Yes?

Rosental Calmon Alves: Yeah, I think we have to.

Matt Waite: Yeah.

Janine Warner: Rosental keeping us moving.

Larry Birnbaum: Thank you very much.

Janine Warner: Thank you all so much!

[Applause.]