Chair and presenter: <u>Bill Adair</u>, Knight Professor of Journalism & Public Policy at **Duke University**, creator of **PolitiFact**

- **<u>Pablo Fernández</u>**, director of editorial innovation, **Chequeado, Argentina**
- **<u>Day-young Oh</u>**, chief of Team Fact Check, **JTBC TV, South Korea**
- **<u>Katie Sanders</u>,** managing editor, **PolitiFact**
- **<u>Sérgio Spagnuolo</u>**, ICFJ TruthBuzz Fellow, **Brazil**

BILL ADAIR (INTRO)

Rosental: We have a great panel, so everybody talks about fact checking, we are going to talk about automation and the future of fact checking. Our moderator, chair and presenter is one of the founders of PolitiFact and my colleague … as a Knight chair, and he is absolutely awesome. I have been trying to bring him here for years and finally he is here, but besides that … he is a good guy. So, go ahead Bill Adair.

Bill Adair: All right. Thank you Rosental. All right. So it's great to be here, you know I've done many discussions about automated journalism over the years and they were always in the future tense. Automated journalism is coming. Automated journalism is going to be cool. So, today we're gonna do something different. It's here, we're doing it, we're doing it every day, fact checkers are getting the benefits of automation.

As recently as yesterday, FactCheck.org did a fact check that was found by one of our bots at Duke, so it's a good example of how automation is helping. And fact-checking is on the cutting edge of this for a couple of reasons. One is because fact-checks have greater archival value than a lot of other journalism, so the fact-check that was done a month ago on a politician still has great value because politicians

repeat their lines. So, if we can find that fact-check quickly using automation and serve it to a reader quickly, it has great value, and so that's where automation comes in.

So, today you're going to hear from an all-star panel. You're going to hear about how fact checkers in Argentina are using automation to look through all of the political discourse in Argentina and find claims to check, you're going to hear about how the fact checkers at The New York Times, the AP, PolitiFact, FactCheck.org, are using a bot developed at the University of Texas at Arlington and actually an algorithm developed their bots developed at Duke that send suggested claims to check to them every day.

You're going to hear about a Twitter bot that replies to false tweets in Brazil, and you're going to hear about Squash, which is a new product that we're developing at Duke where we've had a major breakthrough in full automation, the dream that you're watching a speech on TV, the automation detects what the person is saying and automatically pops up the fact-check, so, it's a really exciting time for automation.

We're also not leaving out TV. We're going to look at some of the incredible things they're doing in South Korea on television at GTBC, which has for my money the best television fact checking anywhere using some really marvelous journalism.

And thinking about automation, you know... we often say we're afraid of our robot overlords, I can tell you I've been there, I've met our robot overlords and they're cool, and I think that this is going to work out.

So, with that let me just quickly tell you about our all-star panel. We're going to start with Pablo Fernández who is the director of editorial innovation from Chequeado, then we're going to hear from Sérgio Spagnuolo who is the ICFJ Truthbuzz Fellow in Brazil, then from Day-young Oh who is the chief of Team Fact Check at JTBC TV in Korea, and then Katie Sanders the managing editor of PolitiFact, and then I will come back, with that... Pablo.

Pablo Fernández: Hello everyone! How are you? Awake? Well, first of all thank you for having us here. The idea is to show you some products that we are building, but one thing that I will tell you at the end is that it's not that complicated to create this kind of technology we are doing it with one and a half developer.

So keep that in mind. This is the platform that we build, but first of all I will tell you some things just in case. Chequeado is a nonprofit and nonpartisan fact checking organization created almost 10 years ago, 9 years ago.
And the idea is to raise the cost of lying that is... now in the U.S. you know about this, but it's something very interesting and we have our long story in Latin America about that. Why we need Chequeabot? Chequeabot is the name of the platform as I told you. The idea is that a fact checking isn't cheap at all.

To create a fact check I used to work in traditional newsrooms, you publish a lot of articles every day with fact checks that is another case. You may have to wait between 2 or 3 days sometimes to wait for the sources to answer you. You have multiple sources by article so it takes you a lot of time.

So that's why we need help, and that's where automation enters because we really think that there's a lot of things that the newsroom do every day that can be automated and there's no value in humans doing that. One thing that is important is that we need to find claims everyday to fact check. The claims are the most important step of the method because we need that to fact check.

So that's an example of a thing that we can do, and we think that in this environment of misinformation is much more important than in the past. This is our method just in case, and we discuss it with Bill before and then yes you will see that in the next speakers that this is our method and it's different in some countries about more or less is similar to this, so keep this in mind.

Usually we select a phrase from the public debate. We weigh its relevance and then we consult the original source, alternative source, and then we get to our rating. I'm just doing it briefly because we don't have a lot of time, but we think that at least right now three of this is steps we can have health from our robot, a software robot just in case.

The idea is that Chequeabot can help us select a phrase from the public debate, we will tell you that these methods has more than 8 years, so when this method was created we didn't have any idea about how to create a robot, weight its relevance I will tell you how, and then consult the official source. Consult the official sources something that we are starting to do because we need the government to open the data for API, and that's not the case all the time.

What is Chequeabot? A platform that we use daily. This is important as it's something that Bill said. This is working right now and actually for more than 2 years. It is not the future, it's happening right now, it's happening in Buenos Aires. It was developed in-house, we started in the beginning doing what we think that that matters most, and then we talk a lot with the newsroom that I think something that I would suggest a lot to do with your products, start talking to the user first, and just in case, this is an open source project. Everything that we do we try to open if possible, and now you can watch it on GitHub at Chequeado.

What are we building after listening to our users? This one is the tool that we use everyday. It finds claims in more than 30 media outlets in Argentina so we cover the whole country. We have more than 20 provinces or states so, for us it's important to have that reach and that nothing important at least get lost.

Other thing that it does, it sees what the president says in the presidential speeches and also finds the Congress transcriptions. So, if there is a fact checkable claim there it will find it. Then text, this is interesting, this is a tool that was asked by the newsroom, they want "hey maybe there is not in a media outlets and I receive a PDF with a lot of text and I want to find claims there, it's something really easy to do, so they can copy-paste the text and find the claims.

What you are seeing there is in Spanish, it's a highlight fact checkable claim, so this is a demo I did this week, this is an actual speech from yesterday or two days ago, so it's released in just 10 seconds, they have the fact checkable claims. Imagine that two years ago they have to spend a lot of time doing this. Last year we did the first life fact checking with automated speak to text and that is very important where not only fact checkers in the world, but a lot of fact checkers in

the world do life fact checkings that usually is like fact checking the State of the Union of every country.

And imagine that two years ago we need to have two or three people listening very badly about people listening to what the president is saying just to write down what are the claims that we are going to fact check, make sense? No, but that was the case because the technology wasn't there and now it is. We we did it last year in an abortion debate that we are having, we're still having in Argentina, and we use that year Full Fact and Speechmatics that is a fact checking charity in UK and Speechmatics is a technology company in the UK.

And this year we're starting to use google to speak to text, we used it in our State of the Union, this is a screenshot of actually when the president was speaking the robot was transcribing it, and usually it's really good. Sometimes there are mistakes, but it's much better than having three people looking at it, and then it helps us create products really fast, so then we have a partnership with La Nación that is a big media outlet in Argentina, and we were ready to publish the content much faster and very accurate, that's very important for us.

I have three minutes, so I'm running. This is something that we think that can help maybe not only you, but a lot of the people in this room, this is something easy compared to the other stuff, but if you spend time listening to videos in YouTube now with this tool you have the transcription in five seconds, so you can try to find the claims or whatever you are doing there, it's not only for fact checkers.

Look at this, and then you click the phrase and it finds the exact spot in the video to double check if the robot listen to it directly. This is a low tech because actually the subtitles are in YouTube, but we create this interface, transcript-o-matic we call it, and then we create simple and experimental bots, this is really simple.
We are experimenting with the Twitter platform, but what if people want to ask us "hey what was the last fact check about inflation?" the inflation rate is something very important in Argentina, so we are thinking on this kind of experiments and if people are going to get engaged with that or not, but is really easy when you have all the technology built before.

Some key learnings, and I'm starting to finish, you don't need a huge team as I told you before we are doing it with Mariano that is with us six hours every day, but he's not doing automation all the time, he keeps our WordPress updated, everything from that to automation.

Then open source it's great of course and collaboration is key and I know that it's a trendy word, but it's totally real in our case. We learn about this in the tech and check confidence that Bill put together, it was four years or three years ago, and then we started a also talking with Full Fact that they made a white paper really interesting for relating with automation, and then we are also working with reporters love and Latam Chequea that is the network of fact checkers in Latin America, then something very important that we always have a woman in the middle, right now we don't think that that technology is there to do that maybe in the near future, but not right now.

And something for you, amigos: this is better, but you can use it right now. This is the last tool I showed you where you can transcribe from YouTube. You only have to add the link there and magic, you have the transcription. This is like a small present from us to you and you have it in a Spanish and in English, and of course it will work in every language, but the interface is built on that. So thanks! If you have any collaboration ideas I'm here, thanks!

Day-young Oh: Hello everyone. Great to see you in a beautiful city. I'm from Korea and my name is Day-young Oh. I guess most of you are unfamiliar to Korean media and fact checking systems. So, I think it is meaningful to introduce what I do and what I try to do everyday as a fact checker, so let's begin.

Yeah, I'm the fact checker in JTBC and the chief of a team fact check over JTBC, and I have been covering political, social and foreign affairs for 13 years, and sometimes I take the news anchor for breaking news.

Look at this chart, JTBC launched in 2011, so [we'll have our 8th anniversary at] the end of this year. The most trusted media in Korea is JTBC. 44% answered they trust us. Look at this man, do you know him? He's very very famous in Korea, he's more famous than any other TV star. His name is Suk-Hee Shon.

Mr. Shon is the CEO of JTBC. In 2017, the former president of Korea has been impeached, at that time JTBC obtained significant evidence and we reported every day and finally the court impeached her. Mr. Shon is in the middle of that event. After that reliability and trust increased, 72.1% answered I trust him as a journalist.

This is my team, we have five members including me and at the center, who is that? Yes, Mr. Adair, visited last year Korea for participating in a fact checking conference in Seoul, and thankfully he visited my office and we spent time together. We have five members and we do every day fact checking, exactly every week day.

In 2018 last year, we covered 163 topics, I analyzed what topic we focused on. Fake news was 45%, and politician's claim was 30%. I think you can easily understand how fake news is serious in Korea. Okay, I prepared a video that I did and I will show you, and before that there is something wrong, some misspelled of someone's name, sorry about it. It doesn't work? Oh no, OK, I will share the video on email to you.

Next page, the video is about what I did two years ago, about Korea and the US FTA. Donald Trump's dad claimed the deficit is doubled because of FTA. It's true, but there is another context. Without FTA the deficit would be worse.

The definition of fake news in Korea I think it is similar to yours, so there is no more to explain. These are types of fake news in 2018, what I did. 45% is about North Korea. As you know, Korea is the only country divided into North and South, so our goal is to reunify the nation, but someone who against it they created about North Korea fake news and spread it so crazy, so it's a social problem in Korea.

And second is Olympic Games. Last year we held Kim Chung Winter Olympic Games. Olympic Games was successful, but someone who want to irritate it, they also made fake news. And third hatred, discrimination of gender and race, so it is also serious fake news last year.

This is breaking news. U.S. Treasury Department decided secondary boycott to own one of the banks in Korea because of violation of remittance to North Korea. So, the U.S. will announce on November 6th, 2008, but it was fake news. However, Korean stock market shot that they some stock price fell down.

This is another fake news in Korea. IOC spokesman said, IOC spokesmen criticized Korean dialect of Olympic spirit, so I contacted him IOC said this is total fabrication, this is very confusing in Korea and during the Olympic Games and next, who is that? He is the president of Korea right now.

Mr. President suffering from dementia, so fake news claim that the president step down from his presidency, but he was totally forced, junk news they used time there. I think there is some reason they can use this spreading quickly in Korea. One of them is penetration rate in Korea. Smartphone 49% of people using them every day, every time and through social media they can use spread in three hours I examined.

One more reason is this, as I say Korea is a divided country, so who wants to keep on this situation make fake news. So, we have pain about social historical. This is creation and circulation of fake news in Korea, maybe the same as you. Fake news is amplified through social media and some politicians quote it as a louder speaker, so confusing is spreading so which time of fact checking is here, here, here? Yes. I think preemptively and actively, I suggest pushing system and A.I. Speaker.

A.I. Speaker is used in Google I know, but in Korea it's not used yet. A.I. Speaker is about just true or false? No, I mean we use A.I. Speaker to explain the context, the context though fake news and the context of fact checking. That's all. Thank you.

Katie Sanders: Hello everyone, I'm Katie Sanders. I'm the managing editor of PolitiFact. I'm based in St. Petersburg Florida at the Poynter Institute for Media Studies. OK, so true to the theme of my presentation I will try to go fast so we can get to more discussion and get to lunch, very importantly. So, I'm going to go this fast.

When you think about the speed required and American fact checking these days I'm sure this image comes to mind. Me and Bill Adair, you guys are in the other cars and we're swerving around lies and misinformation.

In truth, the reality of daily fact checking is only slightly less intense and glamorous. So, PolitiFact is an American fact checking organization that was founded in 2007. We are split between offices in Washington D.C. and St. Pete.

Our staff is small, we're about 10 people give or take, but we cover a lot. We cover the president, we cover Congress, we cover elections (big one coming up), and we also cover a lot of misinformation on Facebook, and we do this with our truth-o-meter.

Now, PolitiFact was very innovative from the start in American fact checking. We did a few really cool things at the beginning which I wasn't actually there for, but from the start we had this really cool and different vision. So, our website is driven by data so you can look up fact checks based on a category, or a topic that you're really interested in, or you can look up fact checks based on somebody that you're considering voting for or definitely somebody you're not considering voting for.

The more we fact check someone we create a scorecard that carries with that person, so that's really cool. Scorecard that you happen to see up there is for our most fact checked politician right now, President Donald Trump. We also invented the truth-o-meter which sounds like a scientific instrument, it's really not, but it's going to give you the best indication of what our vetted reporting concludes about a given statement.

So, these tend to be the more popular ratings false and pants on fire. We've inspired versions of our rating scale all across the world, and finally PolitiFact also knew that we could do even more fact checking coverage at the local level, so we started this McDonald's affiliates model where we found partners and willing states to give the truth-o-meter treatment to their politicos. So we have one in Texas actually right here a longtime partner at the Austin American Statesman.

As I said we have a big election coming up, but actually it's already here. You may think this is a photo from Donald Trump's inauguration in 2017, it's actually not, it's all the democrats who are running for president in one photo, we got them together you guys!

No, really, we have a really exciting period ahead of us, and I think that our foundations that we started 12 years ago are really going to serve us well, but there's kind of a problem with that, and if I could go back and edit this slide I would add "problems" and make that plural.

We are pretty much who we are or who we were is who we are now. We are a team of journalists, a team of writers, team of editors, our specialty is words. That's pretty much what 95% of the people on our team do, and that's what it takes to do the amount of fact checking that we do at all the different levels.

In the meantime with that specialty we've noticed fact checking catch on around the world, but also in the United States and we have a lot of worthy competitors now who are doing really impressive presentations, new formats, fact checking is growing and there are all kinds of new impressive technologies that have emerged, we actually have some catching up to do I think.

And finally we have you guys, we have readers who want immediate answers whether something is true or not, and that is like a not so easy. The typical fact check takes of one or two days of research as my colleague from Argentina explained, that's a must, we're not willing to compromise on that for the first time that we're looking at a claim.

So reporters spend one to two days doing a deep dive, you do the interviews, you get your data, you condense it into 800 words (we're trying to keep it less than that), and then we put our fact checking heads together at the editor level and we decide what rating it should be. This is really a rigorous process and it's important that we not be flip about our ratings, right?

But that's a lot slower than I think what sometimes misinformation or big missteps and political rhetoric need. This is what readers actually expect us to do anytime

something is like going down on social media or in a big speech and this is also our goal, we feel this pressure to respond right away.

We have to be careful because sometimes in that effort to respond right away with the facts and we sidestep that process on social media or in a tweet that we think is brilliant witty we actually have seen a lot of blowback, so we have to be really careful when we're trying to swerve on truth like that.

So there are three things that we're thinking about that we really want to get better at and one of them is we need to find claims faster. You guys did a great job explaining the hours of time it could take really to find the best claim. I think the question I get most often is "how do you decide what to fact check?" and that's really like what takes the most amount of time I think. So we need solutions that help us find claims faster. We also need tech solutions to help us find more people to expand our audience.

The trust panel earlier was great, there are a lot of challenges in that, but we really want to make sure we're growing our audience and we're getting fact checks in the hands of people who need them whether they are users online or they're just interested in the political process. Finally, we need to really emphasize pairing corrections with hoaxes were false statements ASAP.

These are really important to us, but like I said we're a team of writers, team of editors, so we are very interested in a lot of these tech solutions that have come up, but we're not really like waiting around for some big monumental change to happen. We're doing a lot of kind of incremental innovating in the meanwhile so the one thing we're really targeting is finding new audiences.
We've announced some really fabulous partnerships just this month to help us meet that goal. So a big one that came out recently was a new deal with Noticias Telemundo which is going to translate our fact checking work into Spanish for millions of Hispanic viewers, and that is really really cool.

We're kind of engaged in the translation process, so the fact check you know translates well, but this is really cool, it's just getting off the ground. We also announced a new partnership with Kaiser Health News. Kaiser, for those of you

who aren't familiar with it, they are top dogs in health reporting especially on policy, they have a really deep bench of people who are experts on all kinds of topics.

We have like one health care guy, so this is a really incredible opportunity for us to strengthen what we already do really well which is cutting through political spin on health care, and finally last year my colleague Aaron Schock and I started a new totally new thing with a channel called Newsy, this is a scripps zone channel and they liked this Facebook Live show we were kind of doing super goofy not that professional, but this has turned into a weekly Sunday morning TV show and we managed to put this on despite not having anyone with real video experience on our staff of PolitiFact and much less video editing capabilities, but I want to show you a clip just so you get a flavor of what I'm talking about.

Welcome to What the Fact, a show built upon the idea that cheesy jokes, low budget props, and fact checking go together like Donald Trump and his make America great again hat, are you ready? You just can't trust stories about Bill Gates quite frankly. Billions of dollars, coincidence? corruption? It just seems like it was written by a really stupid robot, not a comma to be found. Pants on Fire.

We actually got some negative viewer feedback on the buttons so it's out, but this is a really cool, really fun thing that we do, it doesn't take all that much more work it doesn't require a new fact checking or new fact checks, we go over all of our stuff. We get to highlight our misinformation work, our local work, and of course our weekly White House segments, and I guess I have a couple more things to cover.
Bill alluded to this really cool robot that we use to help speed up those decisions that we make. This is a little screenshot from a CNN program last weekend. I was not watching it which is what makes Bill's tool so good. This happened Sunday morning on CNN is a really interesting discussion on voter rights, new legislation to kind of crack down on voter legislation and this is the digests that gets emailed to not just us, but American fact checkers highlighting the best options that were said on CNN which is really really cool. I highlighted one in particular that is actually very interesting to me and I assigned it to a reporter.

Kind of making my point that this stuff takes time that fact check is still not done yet because we had other things to cover this week, but it was a great tip off so thank you Bill and the claim buster technology.

And finally, one thing we've always done really well is local fact checking. This is a really nice specialty of ours and with the belief that the more local fact checking that is done before showing we can hold local politicians accountable, might actually be able to win over more readers who can see what we're doing. So, we want to do more things like we did in 2018 when we got a grant in September before the November election and did all this crazy fact checking in the most competitive congressional district races, that was really fun.

And we also teamed up with local universities in red states like West Virginia and Missouri, we continue to do a lot of aggressive fact checking their training their students, co-teaching with their professors, did pass on our methods. We still have these big dreams, many of you guys have made more progress than we have, but until then are our mantra is really like we can't wait for that, we're gonna do what we can while the solutions come to us. Thank you.

Sérgio Spagnuolo: Hello! Good morning to you guys. First of all, I wanted to thank Rosental and the nice people of ISOJ for the opportunity to come here especially Mr. Patrick Butler.

And I'm gonna talk today about TruthBuzz project in Brazil. TruthBuzz is an initiative by the International Center for Journalists and we work in close partnership with newsrooms in several countries, Brazil, Nigeria, Indonesia, India and here in the U.S. as well.

It has the support from the Craig Newmark philanthropies. So, what do we do basically? We do some consulting with the newsrooms to understand what they need and what they want to do. We do a lot of researching to really get to feel how things are going in journalism right now, and we also help with the development of projects and technologies.

In Brazil we work with Aos Fatos which is a leading fact checking organization and we also work with Folha de São Paulo, which is one of Brazil's main newspapers. Today I'm going to talk about the projects we did with Aos Fatos because of the topic of this presentation. So, in my opinion and from the research we did automation for fact checking has to be 3 things.

1. It has to be simple. 2. It doesn't need to be like the fancy coding and cool interface. Of course it can be all that, but it can be simple, it can be cheap to make, it can be really easy to use that's a good thing about it because if you do something really complex that takes a lot of time to develop and the journalists at the organizations cannot understand it this creates a barrier for the product to be used. 3. And you've got to be replicated, you've got to be able to replicate this for other projects as well.

So, that's the three main things I think automation for fact checking must be. One example is this Twitter monitoring bot we developed to check our president's Twitter account. So, every time he tweets it got mirrored in this project here, and every time he deletes a tweet it has a tag that says that it is a deleted tweet and before anyone can say "oh this is infringement of Twitter rules" there is a clear understanding that public officials everywhere, this is Twitter talking not me that deleted tweets from public authorities must be kept or can be kept, right?
So, we do this to keep the government accountable especially in Twitter which is our presence main social media platform tool to make policy and fire ministers and all this kind of stuff, basically right? We also have this fact checking aggregator also to fact check the claims of our president. So, we go to a google sheet and we put the rating of a fact checking claim, we also put the quotes and put everything there and creates like a self updated chart. We never touch this tools, right? this is all automated, so we just go there and put the fact checking claim, we put the rating, we say if it's true or false or whatever, and it's self updates this chart right here.

We also have this life debate tool which everyone who did live anything, you need a self updating tool. You can't just go to the CMS and click publish all the time you want to publish some claim or some fact check. So, help developing this tool so they can simply use a Google Sheet and they go there and put the claims and it

goes to the website immediately and it self updates itself, you don't need to ever touch the CMS to make it work.

So, what do those projects have in common like overall? They all are used for fact checking or for journalist organizations, but what did they have in common? First, they're simple, right? They're totally white label, they're not powered by this company or anything, it's just a really simple development that we use. It's very clean. We don't need a lot of a robust server side kind of development, it's just Google Sheet, right? So, because it is Google Sheet anybody in the team can go in there and just use it and understand how it works.

You can edit, you don't need to go to the back end of our website or talk to our developer to fix a lot of this stuff of course if it crashes or if the code is wrong it won't work, but usually you don't need a lot of work to just use the tool to fix something that you publish wrong or typo or whatever, you just go there and add it yourself.

And of course it's replicable. Anytime we want we can make these tools appear for another purpose again. We can use the Twitter bot not only for the president, but for other stuff, for other politicians, for corporate Twitter account, for anyone else. You can use a lot of this stuff, of course, is all open source, so anybody can use it as well.

Of course we can have more sophisticated stuff as well, we don't need to only use Google Sheets. We have Fatima bot which is a Twitter bot that pushes news, pushes content to Twitter users that shared some URL that contains false information. It was developed by our good friend here of ISOJ fellow Pedro Burgos, and it's more sophisticated, it uses Twitter API, it pushes the links through a database where we keep the records of those URLs that we fact check and we know they contain fake information.

So, it's a more sophisticated kind of tool, but of course it's good to have all this bulky, robust, development behind all this projects, but overall I think simplicity is the key for automation because it costs less money, it's faster to develop, all the projects I showed you before it took me two weeks to develop in full. Of course if

you tweet every now and then you'll make better some aspects of it, but usually it's very cheap for organizations to implement that, right? That being said, I'm here for any questions you might have. Thank you very much for this.

BILL ADAIR (PRESENTATION)

Bill Adair: All right, so I love the slogan because the future is here and we also mean that to mean the future is at Duke. So, the tech and check co-operative is a project that has some really basic goals to create pop-up fact checking for TV and the web, to deploy ClaimBuster. ClaimBuster was this great algorithm and so what we've done, as Katie mentioned, is get it to the fact checkers.

So, every day the fact checkers at the AP, New York Times, the Washington Post, PolitiFact, FactCheck.org are getting these alerts and they're fully automated, and then we have the Co-op. Pablo mentioned this where we get together with the technologists once a year, we bring them to Durham, and we talk about how we can all work together.

We've got some nice coverage. This was a story that ran in January that sort of set a goal for me that said we're going to do this in time for election year so that means I have to deliver. Fortunately, the story ran in January and sort of gives me at least a year. We also got some nice coverage from Brian Stelter, although because of this it ended up crashing our app because we had so much demand for our FactStream app on State of the Union night that the app didn't work.

So, lesson to self when you get publicity: spin up more servers. So, pop-up fact checking we do in two different ways through our FactStream app. It's available now for iOS, you can download it it's free, but the cool thing I got to talk about today is Squash.

Squash is a fully automated fact-checking system for TV and web video. We had not planned to make it public. We were conducting a private test on the State of the Union night, but we had such a breakthrough that we decided to talk about it. So, it's built on the atomic unit of fact checking, which is a claim review. Claim

Review is a tagging system that we developed with Google and Schema.org that most fact checkers in the world are now using.

When they publish a fact-check, they put this tag on their fact-checks or publish it to a database and that allows Google, Facebook, and Bing to find fact-checks more easily. It also allows us to use the fact checks in apps like Squash. So, claim review is the secret sauce of automated fact checking. It's essentially you can see the code, this is a visible what we call a widget that was the first generation of claim review that we built at Duke, it was called share the facts.

So, one thing Claim Review does when it renders in Google search, the fact-checks are highlighted, they show up really nicely, they show up in wonderful ways and the fact checkers love the traffic they get from that. Google has been a great partner in this, promoting fact-checking in wonderful ways.

When Google puts these fact-checks high in search results, when it puts them on Google News, the fact checkers see lots more traffic and that has been a tremendous boost to getting accurate content to people and to look into boosting the audience for fact-checks. So we're very proud that it came out of our Claim Review product.

Claim Review users in the United States -- here are the four main ones: we worked directly with the Washington Post, PolitiFact, and FactCheck.org. The New York Times has just started using it, but again this is key to be able to do automation they need to use Claim Review with their fact-checks because that's what allows us to tap it.

I'm going to skip past Fact Stream because I'm so excited to tell you about Squash, but first I'm going to tell you about the red couch experiments. So one thing we've discovered (nobody has looked at this before) if you're going to put fact-checks on a TV screen, what is the most effective way to do that? There has been a fair amount of research into the impact of fact checking done by Brendan Nyan and some other great academics, but there has been hardly any at what happens when you put fact-checks on a TV screen.

So, we hired a UX firm in Seattle called Blink and we brought in people to sit on this red couch and look at an edited version of State of the Union addresses and help us figure out the best way to put fact-checks on the screen. We did this back in the fall and it was really revealing. It revealed some things we need to do, but it also revealed that this is really complicated and we're going have to spend a lot of energy looking into this because putting fact-checks on a screen is complicated, particularly because we are finding related fact-checks from the past putting them up almost like an annotation, like pop-up videos if you think of those pop-up videos that we used to watch on VH1, and we have to give the viewers enough information to make sense of it. We have to do that quickly. We have to respect their time, but if they're watching it on television that's not a click-through experience, so this is hard and we realized we're going to have to put a lot of energy into this. This is a quick look at how we manipulated where we put the fact-checks on the screen. All right, I'm gonna skip through and I'm gonna tell you about Squash.

Squash. So one thing I learned working in the tech world is "every product needs to have a cool code name." We decided to call ours Squash. It's a nutritious vegetable. It's also a metaphor for what we want to do to falsehoods. The idea behind Squash is simple; it is to take what people are saying, convert it to text, match the text against Claim Review (the secret sauce), find related fact checks, and pop them up on the screen.

Simple right? If only, so last summer we had a very talented group of Duke students that worked out a framework for us. Step one was to figure out what's the best voice-to-text to use. They decided to use Google Cloud, and their reasoning was Google Cloud did the best job of putting periods at the end of sentences. That's critical because when we submit those sentences to our database of Claim Review fact-checks, Google Cloud was better at that than the other voice-to-text programs.

Also Google Cloud allowed us to submit bits of audio on an ongoing basis during a live event. Then we run the text through Claim Buster, this wonderful algorithm developed at UT Arlington, and that acts as a coarse filter that filters out the sentences that are not likely to be factual claims, and it reduces the number of queries we make against our database.

Then (and this is the hard part), what algorithm are we going to use to do the searching of our Claim Review database, and how quickly can we do that? When our students did it they thought it might take minutes, and so we were thinking that our product was going to be buffered. You would watch Squash on the web, it would be buffered, you would have like a two-minute delay, but you would get an enhanced product that would have fact-checks pop up.

So, all right I only have two minutes, I'm going to play this clip real fast. This is an edited version of what we saw during the State of the Union. So during the State of the Union it was a terrible night, it was a wonderful night, but terrible because Fact Stream crashed, and I was dropping F bombs. I look over at the screen and fact-checks are popping up on the screen; it was amazing. It was one of those moments in your life where you think *I'm seeing the future, this is what it's going to work like.* It was so cool.

Well, let me show you this clip just so you can see what it was like. So, this is edited so that when we did the State of the Union it was out of sync, we re-edited so it's in sync with the audio. [Audio from video clip]: *"In the last two years our brave ICE officers made 260,000 arrests of criminal aliens, including those charged or convicted of nearly one hundred thousand assaults, thirty thousand sex crimes, and four thousand killings or murders."*

Wow. So this is what it actually looks like on State of the Union night. It detected what he was saying and it matched it against a fact-check that PolitiFact had done one month earlier that was very similar because politicians repeat their lines and you can see there's PolitiFact's conclusion that Trump was inflating the numbers.

This was so cool, and that is you know, what I think the future will look like in some way. So, really cool, you know we're high-fiving, all of the problems that we've had with Fact Stream have faded into the distance. We got during that night six relevant matches, so pretty good.

Our pipeline worked. Pipeline is how we describe the process of doing this; the matches were instant. It was so cool. However, here's a spreadsheet that shows the

matches. We also had 14 matches that were not good, including some that were comically bad.

So let me just tell you here's the top one: So what our voice-to-text detected was pretty close to what Trump said: "We also celebrate 50 years since brave young pilots flew a quarter of a million miles through space to play on the face of the moon." That's what Trump said, and Squash matched that with a fact-check about getting a permit to build a road. So, there's some room for improvement.

So, anyway, this is what development looks like and this is how you invent things. We're so excited to be doing this and to be talking about it more. I want to bring up the rest of the group.