Negative: Robo Call Blocking

By “Coach Vance” Trefethen

***Resolved: The United States federal government substantially reform the use of Artificial Intelligence technology***

Case Summary: The AFF plan requires the telecom companies to put anti-robo call AI software into phone service so that consumers automatically get protection against junk and spam robocalls. AFF’s expert is Dawn Song at Univ. California-Berkely. We have some quotes from her study where she admits her solution isn’t ready yet and another guy who says it won’t work anyway.

Important points:

1) STIR/SHAKEN is the Status Quo. These are confusing acronyms that refer to a system already rolled out in the US to automatically stop robocalls. This will be confusing because AFF will read cards from TNS, the company that made S/S, regarding how bad it is. But TNS is not opposed to their own product! S/S was mandated by the FCC (Federal Communications Commission) for all telecoms in the USA as of 30 June 2021. It requires calls to have a layer of authentication that robocalls don’t have. If a call comes in and it doesn’t have that authentication, you will see a message that says “Spam Risk” on your phone, so you can ignore it. It requires NOTHING for the user to do to activate.

2) AFF will claim that Stir/Shaken will fail, using older evidence. This brief updates with 2021 evidence that says S/S is working and that, since it just got implemented, we have to give it time to develop. Also, this brief proves that S/S will get better over time as new technology is added to it.

3) AFF’s “solution” is to forget S/S/ and use an AI system proposed in a paper written by Ms. Dawn Song and others at a college in China and U. California-Berkeley in 2018. Couple of problems with Ms. Song and her paper:

 i) She admits in the paper that her method isn’t ready yet, and needs more study
 ii) She admits her method can’t handle “spoofing,” which STIR/SHAKEN can
iii) Her method has to be installed on the end user’s phones. It is NOT installed by the telecoms on their servers, contrary to the entire purpose of the Affirmative’s plan. They were supposed to be making it easier for consumers to be protected, but the D. Song plan makes it worse.

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Negative: Robo Call Blocking

INHERENCY

1. Stir/Shaken technology implemented in June 2021 (updates all Affirmative inherency evidence)

New law: FCC required call authentication technology in place by June 30, 2021

CBS News June 2021. (journalist Anna Werner) 30 June 2021 “FCC forces phone carriers to step up anti-robocall fight: "If you lie to us, we're going to come after you" “https://www.cbsnews.com/news/fcc-phone-carriers-robocalls-deadline/ (accessed 23 Sept 2021)

Wireless companies have had until the last day of June to implement call authentication technology to stop robocalls. They must tell the Federal Communications Commission whether they are complying with the agency's requirements — risking possible [penalties](https://www.cbsnews.com/news/fcc-225-million-fine-texas-robocall-one-billion-consumers/). An estimated 4 billion robocalls rung in on people's cellphones in the month of May alone — 12 calls per person on average, according to anti-fraud app company Youmail. The deadline comes under new Acting FCC Chairwoman Jessica Rosenworcel, a lawyer who wants wireless carriers to know she's serious about cracking down.

Telecoms were required to implement STIR/SHAKEN anti-robocall technology by 30 June 2021

Octavio Blanco 2021. (journalist) 30 June 2021 The Best Ways to Block Robocalls <https://www.consumerreports.org/robocalls/best-ways-to-block-robocalls/> (accessed 23 Sept 2021)

The major telecom companies have played a part in fighting robocalls, too. They’ve installed technology known as STIR/SHAKEN to identify spoofed calls, which use a fake number to trick you into answering your phone. All carriers had a June 30 deadline, imposed by the TRACED Act, to certify in an FCC database that they had begun implementing STIR/SHAKEN across their networks.

FCC rules went into effect on June 30, 2021, requiring Stir/Shaken technology

Marguerite Reardon 2021. (journalist) Robocalls are out of control. Is a new mandated technology helping? 28 Aug 2021 <https://www.cnet.com/tech/mobile/robocalls-are-out-of-control-a-new-mandated-technology-helping/> (accessed 23 Sept 2021)

The US Federal Communications Commission's deadline to implement technology to [beat back those annoying robocalls](https://www.cnet.com/tech/mobile/tired-of-annoying-and-intrusive-spam-calls-heres-how-to-keep-robocalls-at-a-minimum/) went into effect earlier this summer. As of June 30, every major voice provider in the states, including phone companies AT&T, Verizon and T-Mobile and cable provider Comcast, is required to implement a technology called Stir/Shaken designed to curb the tide of spam calls.

Stir/Shaken is working effectively

Elisabeth Buchwald 2021. (journalist) 23 Sept 2021 Robocalls are biting the dust, but get ready for a lot more spam texts <https://www.marketwatch.com/story/robocalls-are-biting-the-dust-thanks-to-new-technology-but-get-ready-for-a-lot-more-spam-texts-11632343541> (accessed 23 Sept 2021)

Americans are receiving fewer spam robocalls thanks to blocking technology known as STIR/SHAKEN, which stands for Secure Telephone Identity Revisited and Signature-based Handling of Asserted information using toKENs. “STIR/SHAKEN digitally validates the handoff of phone calls passing through the complex web of networks, allowing the phone company of the consumer receiving the call to verify that a call is in fact from the number displayed on Caller ID,” the FCC explains.

2. Free robocall blocking is already available to consumers

STIR/SHAKEN and TRACED Act call blocking are both available today for free

Octavio Blanco 2021. (journalist) 30 June 2021 The Best Ways to Block Robocalls <https://www.consumerreports.org/robocalls/best-ways-to-block-robocalls/> (accessed 23 Sept 2021)

Last year big phone carriers like AT&T, T-Mobile, and Verizon  installed STIR/SHAKEN [call-filtering technology](https://www.consumerreports.org/robocalls/spoofed-robocalls-relief-is-on-the-way/) that recognizes most legitimate phone numbers while weeding out or warning about suspicious numbers. Carriers can also block suspect calls under the new TRACED Act that took effect last year.  For the most part, consumers don’t have to do anything to get these free services to work.

3. Status Quo is enforcing anti-robocall technology

FCC is serious: Federal enforcement is cracking down on telecoms that don’t comply with the 2021 anti-robocall rules

CBS News June 2021. (journalist Anna Werner) 30 June 2021 “FCC forces phone carriers to step up anti-robocall fight: "If you lie to us, we're going to come after you" “https://www.cbsnews.com/news/fcc-phone-carriers-robocalls-deadline/ (accessed 23 Sept 2021)

In April, the FCC required wireless companies to report whether they're complying under penalty of perjury. "I want you on record saying that you are doing these things to stop robocalls. And if you lie to us, we're going to come after you," Rosenworcel vowed. Teresa Murray, consumer watchdog at the U.S. Public Interest Research Group, said the FCC "is done playing."

4. A/T “Stir/Shaken hasn’t worked yet / millions of calls still happen”

Give it time, can’t work overnight! Just got implemented 30 June 2021. It will solve before long

Jim McEachern and Dr. Eric Burger 2019. (McEachern - expert in the governance of the SHAKEN anti-spoofing protocol and an advisor to the Alliance for Telecommunications Industry Solutions. Burger – PhD in computer science) 26 Nov 2019 “[ROBOCALLS](https://spectrum.ieee.org/how-your-phone-company-aims-to-stop-robocalls)” <https://spectrum.ieee.org/how-your-phone-company-aims-to-stop-robocalls> (accessed 23 Sept 2021).

STIR/SHAKEN will make a difference. Not overnight, but over time the number of illegal robocalls scammers place, and the calls’ effectiveness, will decrease. The user experience will be like that of email spam. At one time, experts predicted that email would become useless because no one would be able to find the real email among all the spam. But the industry deployed a variety of anti-spam measures, and eventually the situation improved. Email spam didn’t go away (you still have a spam folder, after all), but it has minimal impact. SHAKEN will provide the first step for a similar assault on unwanted robocalling.

Stir/Shaken is still being rolled out, not finished yet. But so far, it’s working

Transaction Network Services 2021 (company that invented Stir/Shaken) 21 Sept 2021 “TNS Robocall Report: Americans Deluged with 80 Billion Unwanted Calls Over Past Year, But they Aren’t Coming From Tier-1 Carriers” <https://tnsi.com/tns-robocall-report-americans-deluged-with-80-billion-unwanted-calls-over-past-year-but-they-arent-coming-from-tier-1-carriers/> (accessed 24 Sept 2021)

Government and carrier efforts to advance [STIR/SHAKEN](https://tnsi.com/media-center/robocall-scam-of-the-month/) implementation have paid dividends. Tier-1 carriers have deployed the call authentication framework with more than 50% of the total calls in June signed and validated, up from 35% at the beginning of the year. And while the top six US carriers account for three-quarters of all inter-carrier traffic, 95% of high-risk calls originate from non-Tier-1 service providers.

Status Quo policies will work

Transaction Network Services 2021 (company that invented Stir/Shaken) 21 Sept 2021 “TNS Robocall Report: Americans Deluged with 80 Billion Unwanted Calls Over Past Year, But they Aren’t Coming From Tier-1 Carriers” <https://tnsi.com/tns-robocall-report-americans-deluged-with-80-billion-unwanted-calls-over-past-year-but-they-arent-coming-from-tier-1-carriers/> (accessed 24 Sept 2021)

“The past year has seen tangible progress combating robocalls, in large part due to STIR/SHAKEN implementation, record robocall fines, new legislation and the new FCC Robocall Mitigation Database,” said Bill Versen, President, [Communications Market](https://tnsi.com/products/communications-market/) and Chief Marketing Officer at Transaction Network Services. “Alignment of these efforts with industry-led innovation in advanced call analytics and enterprise branded calling should result in further gains in robocall mitigation, and our Robocall Report is a reminder that bad actors continue to adapt their tactics and employ more sophisticated scams to try to avoid detection.”

Stir/Shaken is improving with new technologies being added by its owner, Transaction Network Services

Transaction Network Services 2019 (company that invented Stir/Shaken) As The Robocall Crisis Grows, Will STIR/SHAKEN Be Our White Knight? Oct 2019 <https://tnsi.com/wp-content/uploads/2019/10/WillSHAKENbeOurWhiteKnight-WhitePaper_US_OCT19.pdf> (accessed 24 Sept 2021)

As the robocall assault continues unabated, TNS remains committed to finding new, sophisticated and affordable solutions. TNS embraces the foundation of STIR/SHAKEN and is working towards standards that can be applied universally to the robocall problem. The Call Guardian Authentication Hub is proving to be another way to address both the gaps in STIR/SHAKEN deployment along with the need for cost containment and affordability of solutions by Tier-2 and Tier-3 carriers.

HARMS / SIGNIFICANCE

1. Call volumes are dropping – since June 30, 2021 reforms took effect

Calls are down 29% in August 2021 compared to before the June reforms were implemented

Elisabeth Buchwald 2021. (journalist) 23 Sept 2021 Robocalls are biting the dust, but get ready for a lot more spam texts <https://www.marketwatch.com/story/robocalls-are-biting-the-dust-thanks-to-new-technology-but-get-ready-for-a-lot-more-spam-texts-11632343541> (accessed 23 Sept 2021)

Sick of getting phone calls about your car’s expired warranty when you don’t own a car? A tax refund that’s supposedly waiting for you? Or even a low-interest consolidated loan? You’re not alone. But as prevalent as they may seem, the volume of scam robocalls in the U.S. declined by 29% in August compared to June, when some 2.1 billion scam robocalls were made, according to data from YouMail, a spam call-blocking app and digital voicemail box.

SOLVENCY

1. Harms will still happen post-plan

Even if robocalls stop, scammers will find other ways

CBS News June 2021. (journalist Anna Werner) 30 June 2021 “FCC forces phone carriers to step up anti-robocall fight: "If you lie to us, we're going to come after you" “https://www.cbsnews.com/news/fcc-phone-carriers-robocalls-deadline/ (accessed 23 Sept 2021)

The next target date is September, when any carriers who did not report to the FCC could theoretically have their calls blocked, but Rosenworcel said she will be making some assessments along the way. Even if the vast majority of robocalls stop, scammers are likely to find other ways to reach out — including social media and text messages.

2. Dawn Song solution unfeasible #1 - Doesn’t do what AFF claims

**Dawn Song is the name of an expert cited by Affirmative with an AI solution claiming to reduce 90% of robocalls.**

Dawn Song proposal doesn’t do what AFF claims. It requires the end users to install something on their phones – it DOES NOT fix it at the telecom carrier level.

Dawn Song, Huichen Li, Xiaojun Xu, Chang Liu, Teng Ren, Kun Wu, Xuezhi Cao, Weinan Zhang, Yong Yu 2018 (Li, Xu, Zhang and Yu are with Shanghai Jiao Tong University, China. Liu and Song are with Univ. of California, Berkely. Ren and Wu are with TouchPal, Inc.) 7 Apr 2018 “A Machine Learning Approach To Prevent Malicious Calls Over Telephony Networks” <https://arxiv.org/pdf/1804.02566.pdf> (accessed 23 Sept 2021) (brackets added)

We have the following requirements. Without the access to the underlying telephony network infrastructure. We require the solution to be deployed on end-users’ devices; so, it does not have access to many information about the caller that is only available from the servers in telecommunication providers. This eliminates most of the existing SPIT [Spam over Internet Telephony] prevention proposals. However, we emphasize that this requirement does not prevent a solution leveraging an server to collect and store information reported from the mobile devices.

3. Dawn Song solution unfeasible #2 – Can’t handle spoofing

**“Spoofing” is when the call comes in showing a fake number to identify itself**

Song admits her solution can’t handle spoofing

Dawn Song, Huichen Li, Xiaojun Xu, Chang Liu, Teng Ren, Kun Wu, Xuezhi Cao, Weinan Zhang, Yong Yu 2018 (Li, Xu, Zhang and Yu are with Shanghai Jiao Tong University, China. Liu and Song are with Univ. of California, Berkely. Ren and Wu are with TouchPal, Inc.) 7 Apr 2018 “A Machine Learning Approach To Prevent Malicious Calls Over Telephony Networks” <https://arxiv.org/pdf/1804.02566.pdf> (accessed 23 Sept 2021)

One limitation of our work is that it cannot effectively handle caller spoofing. This is a result as we have been focusing on blacklisting approaches to block malicious calls based on the numbers. We consider mitigating this issue as an important future direction. Also, as mentioned earlier, our system currently cannot distinguish very well between scam or spam callers and sales-related callers. As shown in our study, the active time and whether a number is stored in a TouchPal user’s contact may potentially be used as features to make such a distinction. We plan to investigate related issues in the future.

AI that can’t handle spoofing isn’t a reliable solution, and machine learning doesn’t help

Shrishti Gupta 2019 (PhD candidate at Indraprastha Institute of Information Technology, Delhi, India) Identifying and Mitigating Cross-Platform Phone Number Abuse on Social Channels <https://precog.iiitd.edu.in/Publications_files/Srishti_Gupta-PhD_Thesis-April_2019.pdf> (accessed 23 Sept 2021)

We further look at the effectiveness of caller ID applications that identify an incoming phone call as spam. These applications are vulnerable to fake registration and spoofing attacks which make them inefficient in correctly identifying spammers. Further, we explore that supervised machine learning models to identify spammers are prone to manipulation, therefore, not a reliable solution.

Solution not effective if it doesn’t solve spoofing

North American Numbering Council Call Authentication Trust Anchor Working Group 2018. (representatives from telecom companies that work with the FCC on setting standards) (article is undated but references materials published in Feb 2018) Report on Selection of Governance Authority and Timely Deployment of SHAKEN/STIR <https://docs.fcc.gov/public/attachments/DOC-350542A1.pdf> (accessed 24 Sept 2021)

Because spoofing allows rapid change of numbers by bad actors, existing mechanisms like blacklists while somewhat effective, have proven to become less effective due to illegal robocalls starting to use already allocated numbers that may already be used by legitimate telephone subscribers.

Machine learning model based on learning from “bad” phone numbers isn’t effective

Shrishti Gupta 2019 (PhD candidate at Indraprastha Institute of Information Technology, Delhi, India) Identifying and Mitigating Cross-Platform Phone Number Abuse on Social Channels (brackets added) <https://precog.iiitd.edu.in/Publications_files/Srishti_Gupta-PhD_Thesis-April_2019.pdf> (accessed 23 Sept 2021)

Further, we explored if supervised machine learning models based on OSN [Online Social Network] features can be used to identify spammers that use phone numbers. If we are able to find spammers, all the phone numbers used by them would be considered bad w.r.t [with regard to] OSN. However, our experimental results showed that OSN based models are prone to manipulation, therefore, not a reliable solution to identify spammers (Section 6.5). These detection models relied on the features that can be changed over time. They either considered URL attributes within the tweets or changes in profile characteristics between a legitimate and spam user account. Given these specificities, it is easy for a spammer to manipulate these features to evade OSN detection.

Stir/Shaken solve for spoofing

Transaction Network Services 2018 (company that created Stir/Shaken) (article is undated but refers to events in 2017 in the past and 2019 in the future) Call Guardian STIR/SHAKEN Capabilities <https://tnsi.com/product/call-guardian-stir-shaken-capabilities/> (accessed 24 Sept 2021)

STIR and SHAKEN use digital certificates, based on common public key cryptography techniques, to ensure the calling number of a telephone call is secure. STIR/SHAKEN will identify Caller ID spoofing, a common technique used by robocallers, by authenticating the Caller ID at the origination point of the call, then validating this Caller ID at the termination point.

4. Dawn Song solution unfeasible #3 – She admits it needs more study

Song admits her solution needs more study to handle spoofing and more study to distinguish spam calls

Dawn Song, Huichen Li, Xiaojun Xu, Chang Liu, Teng Ren, Kun Wu, Xuezhi Cao, Weinan Zhang, Yong Yu 2018 (Li, Xu, Zhang and Yu are with Shanghai Jiao Tong University, China. Liu and Song are with Univ. of California, Berkely. Ren and Wu are with TouchPal, Inc.) 7 Apr 2018 “A Machine Learning Approach To Prevent Malicious Calls Over Telephony Networks” <https://arxiv.org/pdf/1804.02566.pdf> (accessed 23 Sept 2021)

One limitation of our work is that it cannot effectively handle caller spoofing. This is a result as we have been focusing on blacklisting approaches to block malicious calls based on the numbers. We consider mitigating this issue as an important future direction. Also, as mentioned earlier, our system currently cannot distinguish very well between scam or spam callers and sales-related callers. As shown in our study, the active time and whether a number is stored in a TouchPal user’s contact may potentially be used as features to make such a distinction. We plan to investigate related issues in the future.

DISADVANTAGES

1. Reduced enforcement

Link: AFF doesn’t like Stir/Shaken, wants us to abandon it before it has a chance to work

That’s apparently their plan.

Link: Stir/Shaken is better at tracing the origin for better prosecution of bad guys

Jim McEachern and Dr. Eric Burger 2019. (McEachern - expert in the governance of the SHAKEN anti-spoofing protocol and an advisor to the Alliance for Telecommunications Industry Solutions. Burger – PhD in computer science) 26 Nov 2019 “[ROBOCALLS](https://spectrum.ieee.org/how-your-phone-company-aims-to-stop-robocalls)” <https://spectrum.ieee.org/how-your-phone-company-aims-to-stop-robocalls> (accessed 23 Sept 2021).

SHAKEN simplifies traceback, turning it into a one-step process no matter how many carriers have been involved in the call. The same digital signature that authenticates a call’s orig-id and attestation level identifies exactly where a problem call entered the network. This method simplifies the process of tracing illegal calls, and will enable authorities to investigate many more complaints in the same amount of time. In the United States, for example, enforcement is handled by the [Federal Trade Commission](https://www.ftc.gov/) (FTC), the FCC, the [FBI](https://www.fbi.gov/), and state and local law enforcement. The agencies should have an easier time coordinating their efforts with a simpler traceback tool.

Impact: Turn the AFF harms, they get worse. Robocalls are stopped more effectively by better enforcement

Walt Hickey 2021 (journalist) 3 Mar 2021 “THE ANNOYANCE ENGINE: Spam robocalls became profitable scams by exploiting the phone system, but you can stop them” <https://www.businessinsider.com/why-so-many-spam-robocalls-how-to-stop-them-2021-3> (accessed 23 Sept 2021) (brackets added; expletive deleted, refers to the Lake of Fire)

Carriers want to move calls around, not actively regulate the calls. The reasoning is clear: if a debt collector robocalls someone, while the recipient may consider that a nuisance, it's absolutely legal. They want to stay out of it. There is a liability component, Quilici said. A pharmacy may contact a patient about their COVID-19 vaccine appointment with an automated call, and if a carrier blocked that there would be [expletive] to pay. Carriers avoid interfering in grey areas, and will only block a gateway carrier or caller when given ample grounding to do so, often by federal action against a bad actor.

Impact: Even small reduction in enforcement can miss a big opportunity to stop billions of calls

Walt Hickey 2021 (journalist) 3 Mar 2021 “THE ANNOYANCE ENGINE: Spam robocalls became profitable scams by exploiting the phone system, but you can stop them” <https://www.businessinsider.com/why-so-many-spam-robocalls-how-to-stop-them-2021-3> (accessed 23 Sept 2021)

Taking down just one entity can have a drastic impact, as seen in the 2018 FTC complaint against [Jamie Christiano and the company TelWeb](https://www.ftc.gov/news-events/press-releases/2018/06/ftc-sues-stop-two-operations-responsible-making-billions-illegal), which the agency said was responsible for creating and hawking "a computer-based telephone dialing platform" behind billions of illegal robocalls.

2. Fly-by-night carriers

Link: AFF doesn’t like Stir/Shaken, wants us to abandon it before it has a chance to work

That’s apparently their plan.

Link: Shaken is better at removing the incentive for small shady telecoms to solicit robocalls to gain revenue

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It’s also possible that a less-legitimate carrier could be tempted to solicit illegal robocalls. After all, the carrier would still be paid for the service by the caller. Simpler tracebacks make it easier to spot a pattern if, for instance, one carrier is hosting a lot of illegal robocalls. While mainstream carriers have no interest in hosting robocalls, SHAKEN removes the small temptation that fly-by-night carriers might have to make money by soliciting these callers.

Impact: Turn the harms of the AFF case. More robocalls will get through.

“NOT” doing Stir/Shaken means we miss a chance to stop a bunch of robocalls that other methods won’t stop.