HELLO, GOOD AFTERNOON.
THANK YOU VERY MUCH FOR
ATTENDING OUR WORKSHOP AND THANK
YOU TO THOSE OF US JOINING US ON
THE WEBCAST. MY NAME IS MIN
HEELIM, I AM WITH THE FTC’S
OFFICE OF TECHNOLOGY THE,
RESEARCH AND INVESTIGATION.
BEFORE WE START I HAVE MANDATORY
ADMINISTRATIVE ANNOUNCEMENTS TO
GO OVER.
PLEASE SILENCE YOUR MOBILE
PHONES AND ANY OTHER ELECTRONIC
DEVICES.
IF YOU MUST USE THEM DURING THE
WORKSHOP, PLEASE BE RESPECTFUL
OF SPEAKERS AND FELLOW AUDIENCE
MEMBERS.
BE AWARE IF YOU LEAVE THE
BUILDING FOR ANY REASON DURING
THE WORKSHOP YOU HAVE TO GO BACK
THROUGH SECURITY SCREENING.
BEAR THIS IN MIND AND PLAN AHEAD
ESPECIALLY IF YOU’RE
PARTICIPATING ON A PANEL SO WE
CAN REMAIN ON SCHEDULE.
MOST OF YOU RECEIVED A LANYARD
WITH A SECURITY BADGE, WHEN YOU
LEAVE FOR THE DAY, PLEASE RETURN
THE BADGE TO SECURITY ON YOUR
WAY OUT.
IF AN EMERGENCY OCCURS THAT
WOULD CAUSE YOU TO LEAVE THE
CONFERENCE, REMAIN IN THE
BUILDING, FOLLOW THE
INSTRUCTIONS PROVIDED OVER THE
BUILDING SYSTEM.
IF AN EMERGENCY OCCURS THAT
REQUIRES EVACUATION, ALARM WILL
SOUND, EVERYONE SHOULD LEAVE THE
BUILDING IN AN ORDERLY MANNER
THROUGH MEANS INSTRUCTED.
AFTER LEAVING THE BUILDING, PROCEED LEFT, PROCEED ACROSS E STREET TO THE EMERGENCY ASSEMBLY AREA. REMAIN IN THE ASSEMBLY AREA UNTIL INSTRUCTED TO RETURN TO THE BUILDING. IF YOU NOTICE ANY SUSPICIOUS ACTIVITY, PLEASE ALERT BUILDING SECURITY. PLEASE BE ADVISED THIS EVENT WILL BE PHOTOGRAPHED, WEBCAST, RECORDED. BY PARTICIPATING IN THIS EVENT YOU'RE AGREEING TO YOUR IMAGE AND ANYTHING YOU SAY OR SUBMIT MAY BE POSTED INDEFINITELY AT FTC.GOV OR ON ONE OF THE COMMISSION'S PUBLICLY AVAILABLE SOCIAL MEDIA SITES. TAKE SEATS RATHER THAN STANDING AS IT'S AGAINST THE FIRE CODE. RESTROOMS LOCATED IN THE HALLWAY OUTSIDE THE CONFERENCE ROOM. THE CAFETERIA WILL BE OPEN UNTIL 2:00 P.M. AND THEN WILL OFFER LIMITED SERVICE UNTIL 3:00. QUESTION CARDS ARE AVAILABLE IN THE HALLWAY ON THE INFORMATION TABLE IMMEDIATELY OUTSIDE THE CONFERENCE ROOM. THERE ARE ALSO SEVERAL FTC STAFF THROUGHOUT THE ROOM WHO HAVE QUESTION CARDS. IF YOU HAVE A QUESTION, PLEASE RAISE YOUR HAND, FILL OUT THE CARD AND FTC STAFF WILL COME TO RETRIEVE IT. FOR THOSE OF YOU PARTICIPATING BY WEBCAST, TWEET YOUR QUESTIONS AT FTC, USING THE HASHTAG VOICE CLONING FTC. PLEASE UNDERSTAND THAT WE MAY NOT GET TO ALL QUESTIONS. NOW I AM HONORED TO INTRODUCE FTC COMMISSIONER ROHIT CHOPRA.
WHO WILL PROVIDE OPENING REMARKS.
[APPLAUSE]
>> ALL RIGHT.
THANKS A, MIN HEE.
THANK YOU ALL AND WELCOME.
ACCORDING TO RECENT SURVEYS,
AMERICANS ARE LOSING TRUST IN TECHNOLOGY AND TECHNOLOGY COMPANIES.
AND MANY ARE QUESTIONING THEIR ROLE IN IMPACTING SOCIETY.
WE ALL KNOW THE BENEFITS OF NEW TECHNOLOGIES AND THE IMMENSE FORTUNES THAT THEY CAN SHOWER ON US AND THE COMPANIES THAT CREATE THEM.
BUT MANY OF US ARE CONCERNED ABOUT HOW THESE TECHNOLOGIES ARE MISUSED AND ABUSED.
TODAY TECHNOLOGY AND DATA ARE WEAPONIZED BY THOSE WHO WISH TO DO OUR COUNTRY AND OUR SOCIETY HARM.
WE HAVE SEEN HOW THE HARVESTING OF PERSONAL DATA CAN THREATEN OUR PERSONAL SAFETY.
MASSIVE DATA BREACHES FROM THE OFFICE OF PERSONNEL MANAGEMENT, MARRIOTT, AND EQUIFAX, WE HEAR ABOUT THESE EVERY DAY AND MANY HAVE BEEN LINKED TO ACTORS IN CHINA.
A CHINESE GAMING COMPANY WAS RECENTLY ORDERED BY THE COMMITTEE ON FOREIGN INVESTMENT OF THE UNITED STATES TO DIVEST RECENT ACQUISITION OF GRINDR, POPULAR GAY DATING APP AS MANY EXPECTED DATA USED FOR BLACK MAIL, OTHERS TARGET US WITH VAGUE INFORMATION AND CREATE SOCIAL AND POLITICAL DIVISIONS WHICH CAN DISRUPT OUR ECONOMY, DEMOCRACY AND SOCIETY.
PRIVACY IS CLEARLY NOW A
NATIONAL SECURITY ISSUE AND A PERSONAL SECURITY ISSUE. IT'S NOT JUST ABOUT SURVEILLANCE OF OUR MOVEMENTS AND OUR SOCIAL INTERACTIONS.
NEW TECHNOLOGY CAN NOW ALLOW US TO CLONE WHAT WE THOUGHT WAS UNIQUELY OURS, OUR BIOMETRICS, FROM OUR FINGERPRINTS TO OUR FACES, LOSING CONTROL OF OUR OWN BIOMETRICS POSES ANOTHER LEVEL OF PERIL.
WHEN THIS HAPPENS, DEEP FAKEs, DISINFORMATION AND DISTRUST WILL ACCELERATE.
WE'LL NEED TO DETERMINE HOW TO CONTROL THIS TECHNOLOGY AND KEEP IT OUT OF THE WRONG HANDS.
AND TO PROTECT OUR SAFETY AND SECURITY FROM THE DANGERS OF BIOMETRIC THEFT, WE NEED TO BE FORWARD-THINKING WHICH IS SO GOOD FTC IS HOSTING TODAY.
WE CAN'T WAIT FOR MASSIVE HARM TO OCCUR.
THIS MAY INVOLVE NEW LAWS, RULES, LICENSING, EXPORT CONTROLS AND OVERSIGHT.
TODAY WE'RE GOING TO EXAMINE ONE SPECIFIC ELEMENT OF BIOMETRICS: VOICE CLONING.
A GOAL OF TODAY'S WORKSHOP IS TO LEARN ABOUT THIS TECHNOLOGY, ITS IMPLICATIONS AND WHAT CAN BE DONE TO CONFRONT THE DANGER IT POSES.
TO THAT END, WE'RE GOING TO BEGIN THE DAY WITH A KEYNOTE PRESENTATION FROM PATRICK TRAYNOR, THE JOHN AND MARY LOU DASBURG PRE-EMINENCE CHAIR OF FLORIDA'S COLLEGE OF ENGINEERING WHO WILL DISCUSS THE STATE OF VOICE CLONING TECHNOLOGY.
FOLLOWING PROFESSOR TRAIN NOR'S
PRESENTATION, OUR FIRST PANEL WILL DISCUSS HOW VOICE CLONING TECHNOLOGY CAN BE HARNESSED TO ENABLE PEOPLE WHO LOST THEIR VOICES DUE TO INJURY OR DISEASE TO SPEAK AGAIN USING REALISTIC VERSIONS OF THEIR PRE-INJURY AND PRE-DISEASE VOICES. BUT WE'RE ALSO GOING TO HEAR ABOUT THE RISKS VOICE CLONING TECHNOLOGIES POSE AND HOW THEY'RE LIKELY TO BE USED IN SOCIAL ENGINEERING ATTACKS. THIS IS GOING TO GIVE US A CLEARER SENSE OF WHAT ARE THE RANGE OF HARMS THAT THIS TECHNOLOGY CAN POSE? THE SECOND PANEL WILL FOCUS ON HOW TECHNOLOGISTS, CORPORATIONS AND SOCIETY SHOULD EVALUATE THESE NEW TECHNOLOGIES AND WHETHER WE SHOULD IMPOSE CONTROLS ON THE TECHNOLOGIES INTRODUCTION AND AVAILABILITY. THE FIRST TWO PANELS WILL TEE UP THE LAST PANEL OF TODAY'S WORKSHOP, WHICH WILL EXAMINE WHETHER TECHNOLOGIES EXIST OR ARE LIKELY TO BE CREATED THAT CAN MITIGATE THE POTENTIAL HARMS OF VOICE CLONING TECHNOLOGY. WE ALL LOOK FORWARD TO A LIVELY AND INFORMATIVE DISCUSSION AND WITH THAT, I JUST WANT TO THANK ALL OF THE FTC STAFF WHO HAVE WORKED TO BRING PANELISTS HERE TO DESIGN LOGOS, TO ESCORT YOU TO PROVIDE SECURITY, AND EVERYONE WHO MADE THIS DAY POSSIBLE. SO I LOOK FORWARD TO EVERYONE'S PARTICIPATION AND IT'S MY PLEASURE TO TURN THE DAIS OVER TO OUR KEYNOTE SPEAKER, PROFESSOR PATRICK TRAYNOR. [APPLAUSE]
GOOD AFTERNOON, EVERYBODY. 
MY NAME IS PATRICK TRAYNOR AND AS WAS SAID JUST A MOMENT AGO, I'M A PROFESSOR IN COMPUTER SCIENCE AT THE UNIVERSITY OF FLORIDA. 
NOW, THERE MY RESEARCH FOCUSES ON THE INTERSECTION BETWEEN CYBERSECURITY AND VOICE INTERFACE TECHNOLOGY. MY TASK TODAY IS NOT TO GIVE AN OVERLY TECHNICAL TALK. SO FOR THOSE OF YOU CONCERNED A COMPUTER SCIENTIST IS SPEAKING AND THAT YOU'VE GONE TO YOUR E-MAIL ALREADY, MY GOAL IS IN FACT TO BRING US TOGETHER AND TO TALK AT A HIGH LEVEL ABOUT HOW WE HAVE COME SO FAR SO FAST AND HOPEFULLY SET UP THE OTHER PANELS. WE'LL GET IN TO MUCH MORE TECHNICAL DISCUSSIONS AS THE DAY GOES ON. LET ME BEGIN BY ASKING A LARGER AND MORE IMPORTANT QUESTION AND THAT'S WHAT IS IT THAT MAKES US UNIQUE? IN PARTICULAR, WHAT IS IT THAT SEPARATES HUMAN BEINGS FROM THE REST OF THE ANIMAL KINGDOM? IF I TOOK A POLL IN THIS ROOM YOU MIGHT POINT TO ARCHITECTURE OR ABILITY TO DO SCIENCE. BUT SCIENTISTS WOULD ACTUALLY TELL THAT YOU IT'S QUITE LIKELY LANGUAGE AND SPEECH SEPARATES US. YOU MAY WANT TO INTERRUPT AND SAY PATRICK, MY DOG SPEAKS, MY PET BIRD SPEAKS, ANIMALS CERTAINLY COMMUNICATE. AND THAT'S RIGHT. BUT WHAT MAKES HUMAN LANGUAGE AND SPEECH SO INTERESTING IS THAT WE TAKE A VERY SMALL SET OF
Utterances, sounds, and combine them effectively into infinite outputs. That is think of all the sentences you can possibly say with only a few very simple sounds. It's really amazing because it allows us to do something that other animals can't. We don't just say there's a predator over there behind the bush or there's good food by the river. It also allows us to explain concepts, allows us to think about the theoretical, it allows us to lie to each other, to be truly social beings. So speech is incredibly important. It is in fact power.

Now, once humans figured this out, we set about the task of trying to figure out how we could give that power to everything else and there's at least a thousand years of recorded history of humans trying to get everything from rocks to statues to other animals to speak. If they could just speak they would reveal their truths and truths of the universe to us. Okay.

As you can imagine, rocks, animals, we haven't done so well with. But let's jump forward about 900 years since recorded history caught us trying to do this and talk very briefly about some of the technologies we have had along the way and what's really accelerated us.
I WANT TO BRING YOU IN TO THE '60s AND '70s, WE HAD VERY EARLY HARDWARE/ELECTRONIC MODELS FOR SPEECH. THESE ARE KIND OF HOW YOU DESIGN SPEECH IF YOU DIDN'T HAVE ANY BACKGROUND KNOWLEDGE. SO THINK ABOUT IT IN THE FOLLOWING WAY: YOU COULD RECORD A DICTIONARY OF A LIMITED SET OF TERMS AND MATCH THOSE TERMS TOGETHER.

IF YOU WERE MORE SOPHISTICATED, TAKE SOUNDS AND THEN GLUE THOSE TOGETHER. THE PROBLEM WITH THAT OF COURSE IS THAT IMAGINE PUTTING A PUZZLE TOGETHER THAT THE PIECES DON'T QUITE FIT. YOU COULD SMASH THEM OR GLUE THEM AS MY KINDERGARTNER AT HOME DOES. BUT YOU WOULDN'T HAVE TRULY HUMAN SOUNDING SPEECH.

LET ME GIVE YOU AN EXAMPLE NOW OF WHAT I'M TALKING ABOUT. EVERYONE I ASSUME WHO IS OLDER THAN I AM KNOWS WHAT THIS IS. FOR YOUNGER FOLKS, THIS IS CALLED A SPEAK AND SPELL. I THINK THE VOLUME IS BEING CONTROLLED IN THE BACK.

>> NOW SPELL VST.
>> THAT IS DONE BY USING SYNTHESIS.

WE TAKE A SMALL NUMBER OF SOUND WAVES, PUT THEM TOGETHER AND WE GET SOMETHING THAT'S CLOSE ENOUGH TO HUMAN SPEECH. ANOTHER EXAMPLE OF THIS, QUITE PROMINENT, IS THE SCIENTIST STEVEN HAWKING ORIGINALLY ABLE TO SPEAK IN THE '70s BECAUSE OF SYNTHESIS STYLE MODELS.

INTERESTINGLY ENOUGH WHILE MODELS PROGRESSED SIGNIFICANTLY
SINCE THE '70s, HAWKING DECIDED HE WAS GOING TO KEEP THAT VOICE BECAUSE IT'S PART OF WHAT MADE HIM UNIQUE. IN FACT IT WAS HIS VOICE. AS EVERYONE NOTICED OF COURSE, THE THING THAT I JUST PLAYED TO YOU WAS INCREDIBLY ROBOTIC. THAT'S BECAUSE HUMAN SPEECH IS FAR MORE COMPLEX THAN TAKING TWO WAVES AND PUTTING IT TOGETHER. THERE'S A LOT MORE THAT GOES IN TO US MAKING THE SOUND. TO PROGRESS FURTHER IN HISTORY OR FURTHER IN TO THE PRESENT, LET'S FIGURE OUT WHAT PIECES COME NEXT. THAT'S ACTUALLY THE MODELLING OF THE HUMAN VOCAL TRACT. THIS SHOULD LOOK FAMILIAR BUT MOST OF YOU DON'T GET TO SEE YOURSELF IN CROSS-SECTION ALL THAT OFTEN. THIS IS MOST OF THE HUMAN VOCAL TRACT. WHAT YOU SEE HERE ARE ROUGHLY 20, ALTHOUGH THERE ARE MORE, IT'S MISSING MOST OF THE NOSE, DIFFERENT PHYSICAL FEATURES THAT ALLOW US TO MAKE DIFFERENT SOUNDS, TO CHANGE THE SOUNDS THAT ARE COMING OUT OF OUR BODY. AS A SIMPLE EXAMPLE FOR ALL OF YOU, THINK ABOUT THE DIFFERENCE IF YOU SAY AN A SOUND AND A O SOUND. PUT HEY POOL TOGETHER. THE A AND O ARE QUITE DIFFERENT. ALL THAT CHANGES IS ONE DIMENSION. YOUR LIPS MOVE FROM WIDE OPEN TO, HEY, TO POOL TO, A CIRCULAR PATTERN. NOW UNDERSTAND THAT TO MAKE SOUND FROM THIS APPARATUS, YOU CAN MAKE CHANGES IN ALL OF THESE
DIMENSIONS, ADDS COLOR, VARIATION, DIMENSION TO THE KIND OF NOISES THAT WE CAN MAKE. WHEREAS THOSE EARLIER SYNTHESIS BASED MODELS ARE GOING TO BE SIMPLE WAVE OR TWO, WE CAN MAKE COMBINATIONS OF LOTS OF WAVES TO FORM MUCH MORE COMPLEX SOUNDS. WHEN WE VIEW THEM TOGETHER, THEY LOOK LIKE THIS.

NOW, THE FIGURE ON THE LEFT IS JUST WHITE NOISE. I'M SHOWING A SPEC TOE GRAM, LOOKING AT POWER, MORE POWER SIGNIFIED BY YELLOW AND LESS POWER SIGNIFIED BY RED. WHITE NOISE, THIS WILL BE AN AGE TEST FOR THE AUDIENCE, REMEMBER TURNING TO A TV STATION THAT WASN'T THERE AND YOU GET STATIC? THAT'S CLASSICAL WHITE NOISE, ALSO GREAT FOR INFANTS TO SLEEP. WHAT YOU SEE ON THE RIGHT IS THE PHRASE TURN ON THE COMPUTER, BEING SPOKEN.

AS WE MOVE THROUGH TIME, MOVE LEFT TO RIGHT, THAT AT DIFFERENT TIMES, DIFFERENT PARTS OF THE SPECTRUM HAVE DIFFERENT POWER. BUT IT'S NEVER JUST ONE SMALL PART. THAT YELLOW LIGHTS UP IN HIGHER FREQUENCIES NOT JUST FROM TONES I CREATE BUT FROM THE HARMONICS FROM MY VOICE.

SO IT TURNS OUT THAT THIS INSTRUMENT WITH MANY DIFFERENT PLACES THAT I CAN TUNE AND CHANGE CAN CREATE COMPLEX SOUNDS THAT ARE REALLY VERY DIFFICULT TO REPLICATE. PEOPLE HAVE BEEN TRYING THIS FOR A LONG TIME, BUT TO GET A PHYSICAL MACHINE TO DO THIS IS QUITE DIFFICULT.

SO WHAT HAVE WE DONE?
WELL, IT WOULD BE NICE IF WE HAD SOME WAY TO AUTOMATICALLY OPTIMIZE AND GUESS AND TIE IN THINGS TO WHERE WE THINK HUMANS ARE WHEN THEY SAY CERTAIN THINGS.

AND IF YOU REMEMBER NOTHING ELSE FROM THIS TALK, I WANT YOU TO REMEMBER THIS SLIDE. THIS SLIDE IS REALLY HOW WE TRANSFORM FROM SAY HUNDRED OF YEARS OF PROGRESS TO RIDICULOUSLY FAST PROGRESS OVER THE COURSE OF THE LAST FIVE YEARS.

THE STATE OF THE ART IS SOMETHING CALLED DEEP LEARNING. YOU MAY HAVE HEARD OF IT THROUGH OTHER SIMILAR NAMES, MACHINE LEARNING, ARTIFICIAL INTELLIGENCE.

THE VERY SIMPLE WAY TO VIEW THIS IS FIRST, IT'S A VERY, VERY COMPLICATED STATISTICAL MODEL OF A DATA SET.

AND I LIKE TO VIEW THEM IN BLACK BOXES, EFFECTIVELY I TAKE THIS BOX AND PUSH SOME KIND OF INPUT IN.

WHEN IT COMES OUT THE OTHER SIDE, I SAY YES, YOU DID A GOOD JOB OR NO, THAT'S NOT WHAT I LOOKED FOR MENT I WILL KEEP PUSHING LOTS AND LOTS OF INPUT THROUGH IT UNTIL IT REGULARLY IS ABLE TO CLASSIFY THINGS THE WAY THAT I WANT THEM TO.

PLEASE UNDERSTAND BY THE WAY, THIS IS A GROSS OVERSIMPLIFICATION OF THE STATE OF THE ART, BUT THIS ALSO ISN'T A MATH CLASS AT THE GRADUAL LEVEL.

I'M CERTAINLY HAPPY TO TALK ABOUT DETAILS OF THIS A LITTLE LATER.
Okay.
So I have this black box and I send all kind of things through it.
The thing that I want you to understand is that machine learning is not by any means a perfect tool.
And so it will also learn things that are not correct.
Remember, because it's a black box it's just about inputs and outputs.
If it learns a crazy path between two things, that path may not actually have any relevance in reality.
And in the last panel today, certainly we'll talk about why that makes these systems vulnerable themselves to attack and not just the source of it which we'll talk about later.
Okay.
So we have very complex statistical models.
We're doing a lot of math.
What's interesting?
Well, it's this hardware revelation.
This is called a GPU.
Some of you who are more familiar with cryptocurrencies will deal with this exact same device.
What happened is starting in 2012 these devices were available to the mass market.
People have been purchasing them, if you're a stockholder for example in many companies that make these, you're probably doing very well.
These have advanced computing power, allow us to the this specific kind of math,
VERY EFFICIENTLY.
WE TAKE THESE ALGORITHMS THAT
EFFECTIVE.
CAN LEARN AND BE TAUGHT IN A
DIRECTION AND WE THROW
TREMENDOUS COMPUTING POWER AT
THEM AND GET VERY, VERY POWERFUL
MODELS.
WE DON'T HAVE TO KNOW
NECESSARILY THE POSITION OF
EVERY SINGLE ONE OF THE
BIOLOGICAL FEATURES IF WE THROW
ENOUGH DATA AT IT AND COMPUTING
POWER THE MODEL WILL FIGURE IT
OUT OR CLOSE ENOUGH TO.
WRAP UP HERE, THE OLDER RESULTS
THAT I'M TALKING ABOUT HERE ARE
TWO TO THREE YEARS OLD.
THAT'S REALLY TO GIVE YOU AN
IDEA OF HOW RAPIDLY THIS FIELD
IS PROGRESSING.
SO I'M TALKING IN PARTICULAR
ABOUT DEGENERATIVE MODELS.
THE IDEA OF GENERATIVE MODELS,
WITH ENOUGH INPUTS THEY CAN HAVE
DEEP LEARNING, KNOWN AS DANS.
TRADITIONAL MEANS TWO TO THREE
YEARS AGO, TO THE THIS WAS YOU
TOOK AS MUCH AUDIO AS YOU COULD
GET AND YOU SHOVED IT IN TO THIS
BLACK BOX AND IT WOULD BE ABLE
TO DEVELOP A MODEL HOPEFULLY
THAT WOULD SOUND CLOSE TO WHAT
YOU WANTED IT TO SOUND TO.
I WILL PRESS THIS AGAIN.
HOPEFULLY GET --
>> THE BUSES AREN'T THE PROBLEM.
THEY PROVIDE A SOLUTION.
>> THIS AUDIO BY THE WAY IS
GENERATED BY A SYSTEM CALLED
TACOTRON BY GOOGLE AND THIS
MODEL IS FAIRLY ADVANCED.
IT CAN BE INSTRUCTED TO GIVE
EMPHASIS TO CERTAIN WORDS.
I'LL PLAY IT AGAIN SO YOU CAN
HEAR IT.
NOTICE THAT IT EMPHASIZES THE WORD PROBLEM AND SOLUTION, MAKING IT FAR MORE CONVINCING THAT IT IS ORGANIC OR HUMAN SPEECH.

>> THE BUSES AREN'T THE PROBLEM. THEY ACTUALLY PROVIDE A SOLUTION.

>> OKAY?

THE CHALLENGE WITH THESE KIND OF MODELS IS THE FOLLOWING: FIRST, TACOTRON IS ABOUT CREATING SYNTHETIC VOICES, NOT NECESSARILY TRYING TO MATCH VOICES. THIS ISN'T GETTING EXACTLY AT THE PROBLEM THAT THE WORKSHOP IS ABOUT NECESSARILY. BUT THE OTHER CHALLENGE IS THAT IT TAKES A LONG TIME IN ORDER TO TRAIN THESE MODELS. YOU HAVE TO HAVE SIGNIFICANT COMPUTING POWER TO THE THIS CONVINCINGLY. THAT THE REALISM REALLY IS RELATIVE.

I GAVE YOU A VERY SHORT PIECE OF AUDIO AND WHEN THE PROGRAMMERS BEHIND THIS FED THIS TEXT TO THE SYSTEM, THEY CAPITALIZED THE WORDS PROBLEM AND SOLUTION. SO THEY GAVE THE MODEL HINTS WHERE IT SHOULD HAVE EMPHASIS. IN GENERAL, ONE OF THE WAYS TO KNOW THAT YOU’RE TALKING TO THESE MODELS IS THEY HAVE A FLAT DELIVERY, THE EMOTION IS GOING TO BE ONE OF THE LIMITATIONS.

ALL RIGHT.

THE LAST MAIN SLIDE I WILL TALK ABOUT IS HOW FAR THINGS HAVE COME IN THAT TWO TO THREE-YEAR PERIOD. WHAT WE HAVE NOW IS VERY, VERY FAST SYNTHESIS. I'M TALKING LARGELY ABOUT A
PAPER THAT WAS PUBLISHED IN 2008, THE TOP VENUE IN COMPUTER SCIENCE FOR DEEP LEARNING, MACHINE LEARNING. WHAT THESE FOLKS REALIZED IS THAT I DON'T ACTUALLY HAVE TO CAPTURE EVERYTHING TO CREATE A CONVINCING MODEL OF YOUR SPEECH. WE ALL REUSE VERY SIMILAR PARTS OF SPEECH. PARTICULAR THINGS LIKE Ps AND Ts, THOSE THINGS ALL SOUND THE SAME. SO IF EVERYONE IN THIS ROOM WENT P-T, IT WOULD SOUND ARTICLE. WE WILL LEARN FROM A LARGE CROWD, PRE-TRAIN BASED ON THINGS THAT ARE THE SAME AND LISTEN FOR PLACES LIKE THE VOWELS, WHERE WE'RE GOING TO HAVE VARIATION. SO I CAN CREATE A GIANT POPULATION MODEL AND THEN PLUG IN SHORT BITS OF YOUR AUDIO IN TO THAT AND USE THAT TO CUSTOMIZE WHAT IS OUTPUT TO YOU, THE SPEAKER. WHAT I WILL PLAY FOR YOU HERE FIRST IS A HUMAN SPEAKER AND THEN THE SECOND IS GOING TO BE SYNTHETIC SPEECH TRYING TO CONVINCE YOU THAT IT'S THE HUMAN SPEAKER. THE HUMAN SPEAKER DID NOT EVER SAY THESE WORD. AND THE SECOND SAMPLE WAS CREATED ONLY FROM FIVE, FROM ABOUT FIVE SECONDS AND FIVE SAMPLES OF THAT PERSON'S VOICE. REAL PERSON FIRST. >> WE ALSO NEED A SMALL PLASTIC SNAKE AND A BIG TOY FROG FOR THE KIDS. >> OKAY. ORGANIC HUMAN SPEECH. >> LEARN ABOUT SETTING A NETWORK
CONFIGURATION.
>> FIVE FIVE-SECOND SAMPLES
ALLOWED US, NOT US, ALLOWED
SCIENTISTS TO CREATE THAT
SAMPLE.
NOW LISTEN.
FROM THE PERSPECTIVE OF
LIMITATIONS THERE WERE A LOT
FUTURE.
LISTENED CAREFULLY YOU HEARD
THINGS ABOUT THE SYNTHETIC
SPEECH YOU DIDN'T LIKE.
SMALL SETS OF SAMPLES CONVINCE
FOLKS IN LIMITED CONDITIONS, ALL
RIGHT?
YOU ONLY HAVE A SMALL SET OF
SAMPLES IT'S GOING TO SOUND
IMPERFECT, A LITTLE ROBOTIC.
HEARING THAT OVER THE THING
TODAY, ANYBODY, ANYBODY HAVE ANY
DIFFICULT HEARING THE DIFFERENCE
BETWEEN THE FIRST AND THE SECOND
SPEAKER?
IF I ASKED YOU TO CLASSIFY WHICH
WHICH WAS LIKELY ORGANIC AND
WHICH WAS GENERATED, COULD YOU
ALL HAVE SAID LIKELY THE SECOND?
YES, BUT IMAGINE THE SECOND
AUDIO CAME OVER THE PHONE, A
ROBO CALL, AUDIO AUTOMATICALLY
DEGRADED ANYWAY BY THE NATURE OF
HOW FAR PHONE NETWORKS WORK.
YOU MAY NOT HAVE BEEN ABLE TO DO
IT.
CERTAINLY REMOVING A, WE'RE
MOVING IN A DIRECTION WHERE THAT
IS THE LACK, A LARGE NUMBER OF
SAMPLES IS GOING TO BECOME LESS
PROBLEMATIC.
BUT IT DOES ALSO HOLD THAT AS
YOU ADD MORE AND MORE SAMPLES
YOU CAN OVERCOME THIS.
PLAY A PIECE OF AUDIO IN A
SECOND THAT SHOWS YOU THAT SAME
MODEL THAT'S, WITH A SINGLE
FIVE-SECOND UTTERANCE AND YOU'LL
REALLY HEAR THE DIFFERENCES.
>> MAKE IT LOOK HARMLESS.
>> HOW MANY COULD EVEN
UNDERSTAND THAT?
>> BUT IF YOU GIVE AT FEW MORE
PIECES OF SAMPLE AUDIO, IT
BECOMES MUCH CLEARER, MUCH MORE
QUICKLY.
AGAIN, COMPARE THAT FIRST
GENERATED ONE, FIVE SAMPLES TO,
THE SINGLE ONE YOU CAN SEE
QUICKLY HOW THAT CURVE GOES UP.
THE OTHER THING TO POINT OUT IS
THAT ORGANIC SPEECH VERSUS
SYNTHETIC SPEECH, SYNTHETIC
SPEECH TEND TO BE LESS DYNAMIC.
HUMAN BEINGS WHEN WE TALK TO
EACH OTHER TEND TO HAVE
DISFLUENCIES, SO I MIGHT SAY AND
PAUSE FOR SEEMINGLY NO REASON, A
MACHINE DOESN'T KNOW TO DO THAT
-- YET -- OR UNLESS WE TELL IT.
HOW LONG WILL THAT LAST?
I'M NOT SURE IF WE'RE PLANNING
TO HAVE ANOTHER EVENT LIKE THIS
NEXT YEAR BUT WE'LL SEE.
THESE DYNAMIC ELEMENTS OF SPEECH
ARE REALLY CRITICAL AT THE
MOMENT FOR DETERMINING WHETHER
OR NOT YOU'RE SPEAKING TO AN
ORGANIC OR SYNTHETIC INDIVIDUAL,
HOW LONG THEY WILL LAST IS
ENTIRELY UNCLEAR.
OKAY.
SO JUST TO WRAP UP, NOW WE'RE
ALL AT THEML
WE ALL UNDERSTAND WHAT'S
HAPPENED.
HUMANS HAVE WANTED TO GIVE
VOICE, SHARE OUR GIFT, THE THING
THAT MAKES US UNIQUE, REALLY FOR
AS LONG AS WE FIGURED OUT THAT
IT'S A USEFUL THING THAT ONLY WE
HAVE.
TURNS OUT THAT NOW THAT WE'RE
GIVING IT TO COMPUTERS, THEY TOO
WILL BE ABLE TO COMMUNICATE AND LIE JUST LIKE WE DO. SO THIS WORKSHOP IS DESIGNED TO DEAL WITH THAT VERY REALITY. LISTEN, WE HAVE HAD PEOPLE WHO CAN IMITATE EACH OTHER FOR AS LONG AS WE HAVE HAD VOICE. BUT WHAT THIS TECHNOLOGY DOES IS IT ALLOWS US TO DO THIS AT SCALE, ESSENTIALLY FOR ANY INDIVIDUAL WITH INTEREST SURPRISINGLY SMALL NUMBER OF SAMPLES. WHEN YOU WALK OUT OF THIS, I WANT YOU TO UNDERSTAND THE THINGS THAT MAKE THIS POSSIBLE ARE DEEP LEARNING; GPUs AND REALLY GOOD MODELS OF WHAT HUMAN SPEECH IS. WITH THAT, I WOULD LIKE TO TURN THIS OVER TO THE CONVERSATION OF THIS NEXUS BETWEEN TECHNOLOGY, OF THE FUTURE OF WORK, AND SECURITY, CAN KICK OFF IN EARNEST. THANK YOU VERY MUCH. [APPLAUSE] I CAN TAKE A QUESTION OR TWO. OR NONE? [INAUDIBLE] THEY ARE INVOLVED IN EQUALLY COMPLEX EXCHANGES USING AND OFTEN WE SIMPLY DON'T KNOW WHAT WE DON'T KNOW, RIGHT? >> ABSOLUTELY. >> SO THERE'S AN ACADEMIC PIECE TO THIS BUT THERE'S ALSO A GROUP OF US WAS STANDING AROUND BEFORE THE EVENT CHATTING AND SOMEONE SAID WELL, DOGS ACTUALLY CAN SPOT THE DIFFERENCE. I DON'T KNOW IF, SOMEONE, A DOG CAN SPOT THE DIFFERENCE BETWEEN A REAL VOICE AND I SAID JOKINGLY, MAYBE WE NEED TO PUT A DOG FILTER ON OUR EAR SO THAT WE
CAN IN FACT SPOT THE FAKEs.
THIS IS NOT IDLE SPECULATION.
IT JUST TAKES US TO THE END OF
THIS AFTERNOON'S EXCHANGES.
>> I DON'T MEAN TO SAY THAT WE
BY OURSELVES OWN LANGUAGE IN
PARTICULAR.
THERE ARE LOTS OF DOCUMENTED
CASE WHERE'S SCIENTISTS WILL
RECORD AUDIO AND REPLAY IT AND
THE ANIMALS IN QUESTION WILL DO
THE EXACT BEHAVIOR AS IT IF HAD
BEEN LIVE TRANSCRIPTION.
FOOD OVER THERE, THAT'S NOT IN
QUESTION.
WE DON'T OWN ALL OF THE SPEECH.
BUT WHAT WE DO OWN AT LEAST WHAT
WE SEEM TO BE DOING BETTER IS
THAT WE ARE ABLE TO PUT THESE
THINGS TOGETHER TO AT LEAST AS
WE CAN UNDERSTAND IT DESCRIBE
THINGS THAT MAY NOT EXIST YET TO
DESCRIBE CONCEPTS THAT ARE
THEORETICAL IDEAS, BELIEF
SYSTEMS, AND THAT, YOU KNOW,
WHILE WHALES FOR EXAMPLE SING
VERY INTERESTING SONGS AND
LIKELY HAVE VERY UNIQUE PATTERNS
TO THEM, WE DON'T KNOW OF ANY
COMPLEX BELIEF SYSTEMS THAT HAVE
ARISEN FROM WHALE SONG, FOR
EXAMPLE.
SO I DON'T THINK WE OWN IT
ENTIRELY.
BUT I THINK THAT THE CURVE LOOKS
A LOT LIKE THIS IN TERMS OF WHO
BENEFITS THE MOST FROM LANGUAGE.
BEES WAGGLE, RIGHT?
DOGS BARK, ABSOLUTELY.
>> THANK YOU.
>> SURE.
I LOOK FORWARD TO MORE QUESTIONS
ON THE FINAL PANEL BUT I'LL TURN
THINGS BACK OVER.
THANK YOU.
[APPLAUSE]
THANK YOU, PROFESSOR TRAYNOR, FOR LAYING THE FOUNDATION FOR OUR WORKSHOP THIS AFTERNOON. YOU HAVE GIVEN US A LOT TO THINK ABOUT AS WE EMBARK ON OUR DISCUSSIONS.

THANK YOU, EVERYONE, IN THE AUDIENCE FOR JOINING US FOR OUR FIRST PANEL OF THE WORKSHOP. DURING THIS PANEL WE WILL BE EXPLORING THE PROS AND CONS OF VOICE CLONING TECHNOLOGY.

I HAVE A VERY ESTEEMED PANEL JOINING ME TODAY. EACH PANELIST REPRESENTS A UNIQUE PERSPECTIVE ON THE USES OF VOICE CLONING TECHNOLOGY. TO MY IMMEDIATE LEFT IS JOHN COSTELLO, THE DIRECTOR OF BOSTON CHILDREN'S HOSPITAL'S AUGUST MEANTIVE COMMUNICATION PROGRAM. NEXT TO JOHN IS REBECCA DAMON, EXECUTIVE VP OF SAG AFTRA. TO HER LEFT IS RUPAL PATEL, CEO AND FOUNDER OF VOCALID. AND LAST BUT NOT LEAST IS MONA SEDKY, PROSECUTOR WITH THE DEPARTMENT OF JUSTICE COMPUTER CRIME AND INTELLECTUAL PROPERTY SECTION.

EACH PANELIST'S BIO IS POSTED ON THE WORKSHOP EVENT PAGE. PLEASE REFER TO THOSE BIOS TO SEE A FULLSOME DESCRIPTION OF EACH PANELIST'S ACCOMPLISHMENTS.

TO START THE PANEL DISCUSSION, I HAVE ASKED EACH PANEL TO GIVE A FEW REMARKS ABOUT THEIR EXPERIENCE WITH VOICE CLONING TECHNOLOGY. FOLLOWING THESE REMARKS, THE PANEL WILL EXPAND ON THE ISSUES RAISED THROUGH A QUESTION AND ANSWER DISCUSSION.

WITH THAT, I'LL TURN OVER THE MIC TO OUR FIRST SPEAKER, JOHN
COSTELLO.
>> THANK YOU.
I WOULD LIKE YOU TO IMAGINE FOR A MOMENT THAT YOU HAVE BEEN STRIPPED OF THE ABILITY TO SPEAK.
AND THEN YOU HAVE BEEN STRIPPED OF THE ABILITY TO HAVE VOLITIONAL MOVEMENT.
AND THEN YOU HAVE BEEN STRIPPED OF THE ABILITY TO USE FACIAL EXPRESSIONS.
NOW I WANT YOU TO TELL A BELOVED PERSON HOW DEEPLY YOU CARE FOR THEM AND LOVE THEM.
I WANT YOU TO COMFORT A DISTRAUGHT AND SELF-DOUBTING CHILD.
I WANT YOU TO DELIVER A SARCASTIC QUIP TO YOUR FRIENDS.
HOW ARE YOU GOING TO REPRESENT THAT AUTHENTIC SELF?
IT'S THROUGH YOUR VOICE.
SO THE BENEFITS OF CUSTOM VOICE TECHNOLOGY, FOR PEOPLE WHO HAVE ALS, THERE ARE 5,000 NEWLY DIAGNOSED PEOPLE IN THE UNITED STATES AND APPROXIMATELY 25,000 PEOPLE LIVING WITH ALS.
80% OF THOSE HAVE BULBAR SYMPTOMS MEANING THEY WILL LOSE THE ABILITY TO SPEAK.
THIS ARE MYRIAD OF OTHER DEGENERATIVE CONDITIONS FOR CHILDREN AND ADULTS THAT WILL RESULT IN LOSING THE ABILITY TO SPEAK.
THERE ARE ALSO PEOPLE WHO, BECAUSE OF SURGICAL PROCEDURES, THEY WILL HAVE EITHER A TEMPORARY OR PERMANENT LOSS OF SPEECH.
SO WHAT IS THE POWER OF PERSONAL VOICE?
FAMILIAR PARTNERS ONLY NEED TO
HEAR "IT'S ME" ON THE PHONE AND IMMEDIATELY THERE IS A FLOOD OF ATTITUDE AND UNDERSTANDING AND EMOTION FOR WHO THAT PERSON IS AND WHAT YOUR RELATIONSHIP IS WITH THAT PERSON. OUR VOICE IS OUR ACCUSAL FINGERPRINT. THE ROLE OF, AKUFTIAL FINGERPRINT. IT'S A MARKER OF OUR PERSONALITY AND IMPORTANT NOT ONLY FOR THE SPEAKER, BUT FOR THE COMMUNICATION PARTNERS AND AS HAS BEEN REFERENCED AND AS YOU'LL SEE IN VIDEO, THOSE PARTNERS HUMAN AND ANIMAL. SO IN THE VIDEO THAT YOU'RE GOING TO SEE HERE, THE FIRST VIDEO IS A 2 1/2 MINUTE COMBINATION OF VOICE DEMONSTRATION, VOICE CREATION, THAT HAS BEEN DONE FOR PEOPLE WHO ARE AT RISK OR WHO HAVE NOW LOST THEIR ABILITY TO SPEAK. AND JUST TO GIVE YOU A LAY OF THE LAND HERE, WHAT I HAVE TRIED TO DO IS TAKE SOMEONE'S AUTHENTIC VOICE, AUTHENTIC MESSAGES THAT THEY HAVE BANKED AND WHAT WE DO IN BOSTON AND MANY OTHER DOES NOW, IS MEET WITH PEOPLE BEFORE THEY LOSE THEIR ABILITY TO SPEAK AND HAVE THEM BANK MESSAGES THAT ARE IMPORTANT TO THEM, THAT THEY WANT TO MAKE SURE THAT IF EVER THEY CANNOT SPEAK, THEY HAVE READILY AVAILABLE TO BE EMBEDDED IN TO TECHNOLOGY. SO THEY CAN AUTHENTICALLY REPRESENT TO THEIR LOVED ONES, TO PEOPLE AROUND THEM, EXACTLY WHAT IS THEIR EMOTION AND EXACTLY WHAT'S ON THEIR MIND. WE NOW, BECAUSE MANY PEOPLE ALSO
WANT TO MAKE SURE THAT THEY HAVE AN AUTHENTIC-SOUNDING SYNTHETIC VOICE, SO FOR THOSE THINGS THAT THEY NEVER THOUGHT TO BANK THEY WANT TO BE ABLE TO SPEAK THOSE AND HAVE IT SOUND LIKE THEMSELVES.
SO WHAT WE HAVE NOW DONE IS WHAT I CALL DOUBLE DIPPING. TAKING HUNDREDS AND MOST TYPICALLY UPWARD OF A THOUSAND BANKED MESSAGES AND WORKING WITH COMPANIES AND THE EXAMPLES YOU'RE GOING TO SEE HERE ARE WITH THE COMPANY ACAPELLA OUT OF FRANCE, HAVE CREATED A SYNTHETIC VOICE THAT SOUNDS CLOSE TO THAT PERSON'S BIOLOGICAL VOICE.
IN THIS VIDEO WHAT YOU'RE GOING TO SEE IS FIRST, IF YOU READ THE TEXT THAT GOES ALONG, YOU'LL SEE THE AUTHENTIC VOICE AND THEN THE ACAPELLA VOICE.
YOU'LL ALSO SEE ONE DEMONSTRATION OF A VOICE THAT'S BEEN CREATED BY GOOGLE FOR TIM SHAW, SO THIS IS A PUBLIC VIDEO THAT IS OUT OF A VOICE THAT THEY HAVE CREATED FOR HIM.
AND MY PURPOSE OF INCLUDING ALL OF THESE IS SO THAT IT'S VERY CLEAR THE IMPORTANCE TO THE PERSON AT RISK OF LOSING THE ABILITY TO SPEAK AND THE PEOPLE AROUND THEM TO HAVE AUTHENTIC VOICE.
IF YOU COULD START THE VIDEO, PLEASE.
>> THIS IS SYNTHESIS.
WOULD YOU LIKE TO SEE A SHOW?
>> WHERE ARE THE SONGS?
I WANT TO WISH YOU A HAPPY BIRTHDAY
§ I LOVE YOU SO MUCH.
>> THIS IS TIM SHAW, SPECIAL TEAMS ANIMAL.
CHRISTMAS COMING UP.
WE NEED TO FIND OUT WHAT'S
HAPPENING WITH TITANS PLAYER F
YOU HAVE TO HESITATE, THAT'S
PROBABLY A NO.
>> I DECIDED TO WRITE YOU THIS
LETTER.
I HAVE SO MUCH TO TELL YOU.
>> IT'S HIS VOICE.
I'VE FORGOTTEN.
>> I REMEMBER THAT ONE.
>> WE DO.
>> HI, MY NAME IS JOHN.
>> HI, MY NAME IS JOHN.
>> THE FIRST IS SYNTHETIC.
>> THIS IS MY ACAPELLA VOICE.
>> THIS IS MY ACAPELLA VOICE.
>> AND IT'S BASED ON A THOUSAND
RECORDINGS.
>> DO YOU KNOW HOW MUCH I LOVE
YOU?
THAT'S MY NORMAL SPEECH PATTERN.
HOW LONG WILL YOU BE GONE?
>> NOW LET'S HEAR THE ORIGINAL
MESSAGE.
>> HOW LONG WILL YOU BE GONE?
>> CAN I HAVE A GLASS OF WATER?
>> NOW THE SYNTHETIC.
>> CAN I HAVE A GLASS OF WATER?
>>
[INAUDIBLE]
>> IT WAS A COLD DAY IN APRIL
AND AND
[INDISCERNIBLE]
>> CAN I HAVE SOME MAYONNAISE ON
MY SANDWICH?
>> CAN I HAVE SOME MAYONNAISE ON
MY SANDWICH?
>> IT IS SO AMAZING THAT I WILL
BE ABLE TO HAVE MY VOICE IN BANK
MESSAGES HERE.
>> I'M REALLY TIRED.
>> AND IN THE INTEREST OF TIME.
>> IT IS A NICE DAY.
>> LET'S GO TO THE MOVIES.
LET'S PLAY.
>> AGAIN, THAT'S A COMBINATION.
SO IN THIS VIDEO WHAT I WOULD
LIKE YOU TO SEE AGAIN IS THE
POWER OF AUTHENTIC VOICE AND
HOLLY WAS RECORDING TO, SHE WAS
ACTUALLY PRACTICING TO MAKE SURE
THE RECORDINGS IN THIS DEVICE
WERE WORKING.
WE WERE UNAWARE THAT HER DOG WAS
IN THE ROOM.
PLEASE PLAY THE VIDEO.
>> WALKER, COME HERE, WALKER.
WALKER, COME ON.
WALKER, COME HERE, WALKER.
>> THERE WERE FIVE WOMEN IN THE
ROOM.
>> WALKER, COME ON, YOU WANT A
COOK SNI.
>> WALKER ONLY WENT TO HOLLY.
>> AWESOME!
>> AWESOME!
>> WHERE'S THAT SILLY DOG?
WALKER?
COME HERE, WALKER, YOU WANT A
COOKIE?
WHERE'S THAT SILLY DOG.
>> HOLLY WOULD BE VERY HAPPY.
HOLLY PASSED AWAY A FEW YEARS
AGO THAT YOU WERE ABLE TO
WITNESS THAT.
PRIVACY AND SAFEGUARDS,
COMPANIES CURRENTLY WHO ARE
CREATING THESE SYNTHETIC VOICES,
ACAPELLA FOR EXAMPLE, ARE
REQUIRING AUTHENTICATION AND
CREDENTIALALING BEFORE VOICE IS
INSTALLED.
ONE OF THE THINGS THAT I WOULD
LIKE TO PROPOSE FRANKLY IS THAT
THERE IS FURTHER PROTECTION PUT
IN PLACE BY WHITE LISTING, MUCH
LIKE THE DOG WHISTLE YOU WERE
DESCRIBING, HAVING A NOISE IN
THE BACKGROUND OF VOICE THAT IS
PLACED ON ALL VOICE, ALL THE
CODES EXCEPT FOR THE ONE THAT IS GIVEN TO THE AUTHENTIC PERSON. SO YOU KNOW ALSO FROM PATIENTS AND FAMILIES, THERE ARE REQUESTS FROM PATIENTS NOT FOR THE ET THEY’RIAL VOICE, WHEN SOMEONE PASSED AWAY, BUT FOR SPECIFIC MESSAGES. AND SO OUR REQUESTS SO FAR IN CLINIC HAVE BEEN PEOPLE AND PATIENTS WANTING TO MAKE SURE SPECIFIC MESSAGES ARE MADE AVAILABLE. YOU SHOULD ALSO UNDERSTAND CURRENTLY IN SPEECH GENERATING DEVICES TO BE FULLY FUNCTIONAL TOOL THAT VOICE NEED TO BE INTEGRATED IN TO THAT COMMUNICATION DEVICE, SPEECH API, AND IN ORDER FOR SOMEONE WHO USE THAT AS AUTHENTICALLY AS POSSIBLE, AND TAKE ADVANTAGE OF THE POWER OF THEIR SOFTWARE, THEY CANNOT BE RELYING ON SOMETHING BEING IN THE CLOUD, WHICH SOME OF THE HIGHEST QUALITY VOICES RIGHT NOW ARE CLOUD-BASED. AND REALLY SADLY FOR THE END USER IT’S NOT REAL TIME COMMUNICATION. EVEN SOMEONE WHO IS AN EFFECTIVE COMMUNICATOR WITH A SPEECH DEVICE, THEY’RE ENCODING THE MESSAGE AND THEN SPEAKING IT OUT SO THERE IS NOT AT THIS POINT REAL TIME COMMUNICATION. I THINK I’M OUT OF TIME. BUT MY CONTACT IS HERE AS WELL. [APPLAUSE] REBECCA DAMON WILL BE OUR NEXT SPEAKER. >> HELLO THERE. HI, EVERYBODY. MY NAMES REBECCA DAMON AND I AM THE EXECUTIVE VICE PRESIDENT OF
SAL-AFTRA, A LABOR UNION, SCREEN ACTORS GUILD, AMERICAN FEDERATION AND TELEVISION AND RADIO ARTISTS.
SAG AFTRA FOUNDED, SCREEN ACTORS GUILD IN 1933, AFTRA SHORTLY THEREAFTER.
WE MERGED IN 2012 TO BECOME ONE UNION.
WE ARE THE FACES AND VOICES THAT ENTERTAIN AND INFORM AMERICA AND THE WORLD.
SO OUR UNION IS 160,000 MEMBERS ACROSS THE UNITED STATES.
WE ARE WHAT PEOPLE THINK OF US TRADITIONALLY AS ACTORS, BUT WE ARE ALSO BROADCASTERS, BOTH IN THE NEWS AND INFORMATION SPACE, BUT ALSO IN THE ENTERTAINMENT SPACE.
WHEN YOU THINK OF A DISK JOCKEY OR THINK OF A SPORTS CASTER, THOSE PEOPLE ARE SAG AFTRA MEMBERS.
WE'RE RECORDING ARTISTS, SINGERS, DANCERS, STUNT PEOPLE AND VOICE OVER ARTISTS.
WHEN PEOPLE THINK ABOUT VOICE OVER ARTISTS, A LOT OF TIMES THEY THINK ABOUT WHERE DO THEY WORK?
HOW DO THEY WORK?
WHAT DOES THAT LOOK LIKE?
AND I THINK IT'S KIND OF IMPORTANT WHEN YOU'RE THINKING ABOUT THAT TO THINK ABOUT IT IN MYRIAD DIFFERENT WAYS.
YOU MIGHT THINK OF IT IN TERMS OF ANIMATION, HOW MANY OF YOU GUYS HAVE WATCHED AN ANIMATED MOVIE LATELY WITH EITHER, WITH YOUR KIDS OR YOU CAN CONFESSION YOU WATCHED IT BY YOURSELF BECAUSE THERE'S A LOT OF GREAT ANIMATION OUT THERE THESE DAYS.
VIDEO GAMES, WHICH MANY OF OUR
Performers are known for commercials, both our high profile members as well as our rank and file working members, work in all these different spaces. Promos, film trailers, documentaries, audio books, many other areas, radio. So our members are the people that when you're listening to something that is professionally recorded, those people are SAG AFTRA members. So you really do hear us everywhere.

Now, what SAG-AFTRA does, we're the collective bargaining agent for our members for wages, working conditions like health and safety protects, health and requirement contributions, residuals, all of those things flow from our collective bargaining agreements in all those different spaces. And why it's important to think about that is who we are and what we think about when we're talking about voice is we actually are our voices. That is a quantity in terms of what we have, it is also our art. So it's something that when we're having these conversations it's actually really exciting to be up here after John and right ahead of Rupal because of interesting ethical approaches to how voice technology can work but a lot of ways we think about it when we saabing about what SAG-AFTRA is, what we do, what we think society at large needs to be thinking about.
AT SAG-AFTRA, WE BELIEVE YOUR IMAGE IS VALUABLE, YOUR VOICE IS VALUABLE AND YOUR VOCAL PERFORMANCE IS ACTUALLY VALUABLE.
IT IS SOMETHING THAT OUR MEMBERS ACTUALLY MONETIZE AND MAKE THEIR LIVINGS USING.
SO BECAUSE OF THAT WE ARE THE STRONGEST ADVOCATES OUT THERE FOR STATE RIGHT OF PUBLICITY LAWS THAT REQUIRE CONSENT TO THE USE OF IMAGES AND PERFORMERS' VOICES.
THAT IS SOMETHING THAT'S VERY IMPORTANT AND IT'S VERY IMPORTANT ALSO THAT THERE IS A CONSENT PIECE TO IT, OF COURSE, WHERE PEOPLE ACTUALLY GET TO MAKE INFORMED DECISIONS ABOUT HOW THEIR VOICES ARE GOING TO BE USED.
IT IS ALSO IMPORTANT BECAUSE THERE NEED TO BE COMPENSATION THAT IS TIED TO THAT USE OF A PERFORMER'S VOICE.
SO WHEN WE ARE THINKING ABOUT IT, IT'S NOT THE KIND OF THING WHERE WE WANT TO HAVE OUR MEMBERS' VOICES, LET'S SAY WE HAVE MADE A CHOICE FOR WHATEVER REASON TO APPEAR IN A CERTAIN KIND OF FILM OR CERTAIN KIND OF TELEVISION.
IT'S NOT ACCEPTABLE FOR OUR PERFORMERS TO BE USED IN A WAY THAT WOULD BE INCONSISTENT WITH THEIR BELIEFS, THAT MIGHT BE INCONSISTENT WITH OTHER AGREEMENTS THAT THEY HAVE.
SO AS PERFORMERS WE OFTEN HAVE AN EXCLUSIVITY ARRANGEMENT WITH A CERTAIN PRODUCT, SERVICE.
SO IT'S VERY IMPORTANT AS WE'RE THINKING ABOUT ALL THIS THAT THERE ARE RIGHTS THAT ATTACH TO
THAT, BOTH THROUGH COLLECTIVE BARGAINING AGREEMENTS AS WELL AS LAWS ON A STATE TO STATE BASIS. SO SOME OF THE THINGS THAT WE ADVOCATE FOR IS AN ETHICAL APPLICATION OF THESE VOICE CLONING TECHNOLOGIES. IT'S EXCITING. WE ALWAYS KIND OF WHEN WE'RE TALKING ABOUT IT IN OUR BOARD ROOM AND WITH OUR MEMBERS, THINK ABOUT ALL THE WONDERFUL USES. I WAS SO COMPELLED AS JOHN WAS TALKING ABOUT THAT INCREDIBLE ABILITY TO HAVE SOMEBODY THAT WILL NO LONGER HAVE A VOICE TO, ACTUALLY HAVE A VOICE. THAT IS EXCITING AND WONDERFUL AND TREMENDOUS. I'M ALSO EXCITED WHEN I HEAR ABOUT DEFENSES THAT YOU'RE SUGGESTING GO UP BECAUSE A LOT OF TIMES PEOPLE GET EXCITED AND RUSH IN WITH THE NEW TECHNOLOGY AND THEN THEY DON'T NECESSARILY THINK THROUGH ALL THE APPLICATIONS, SO I ALSO WANT TO CONGRATULATE CHRISTINE AND THE FTC FOR PUTTING THIS CONVERSATION TOGETHER. THERE ARE NOT ENOUGH OF THESE CONVERSATIONS. I KNOW, BECAUSE I FEEL LIKE I GO TO EVERY SINGLE ONE OF THEM ON IT. WE ALSO THINK ABOUT THIS FROM A PERSONAL AND NATIONAL SECURITY POINT OF VIEW, AS WELL AS PRESERVING TRUST IN BROADCAST JOURNALISM. THIS IS INCREDIBLY IMPORTANT TO US BECAUSE AS I MENTIONED OUR BROADCASTERS ARE THOSE FACES AND VOICES THAT DO INFORM AMERICA. SO IMAGINE YOU'RE ON THE EVE OF BREAKING A HUGE STORY, I DON'T
KNOW, ANYTHING COULD BE GOING ON, HUGE STORY, YOU'RE ABOUT TO BREAK THAT STORY AND YOU FIND AN AUDIO OF YOUR VOICE SAYING SOMETHING OR A VISUAL DOING SOMETHING YOU DIDN'T DO. AND IT TOTALLY RUINS YOUR CREDIBILITY.

SO WHEN WE ARE THINKING ABOUT IN TERMS OF OF THEIR PERSONAL BRAND, IN TERMS OF THE TRUST THAT THEY MIGHT HAVE SPENT A LIFETIME IN BUILDING, IT DOES HAVE AN IMPACT IN WHAT IS BELIEVED TODAY.

SO AS WE LOOK THROUGH THE IMPLICATIONS FOR THIS KIND OF TECHNOLOGY, WE REALLY BELIEVE IT HAS TO BE DONE IN A WAY WITH AS MANY SAFEGUARD AS POSSIBLE.

SO THAT IS WHY WE'RE EXCITED TO BE HERE TODAY.

LOOKING FORWARD TO YOUR QUESTIONS ONCE WE GET TO THE PANEL.

[APPLAUSE]

>> OUR NEXT SPEAKER WILL BE RUPAL PATEL.

>> THANK YOU.

MY NAME IS RUPAL PATEL.
TIM I AM THE FOUNDER OF VOCALID, CREATE SYNTHETIC VOICES THAT SOUND AS REALISTIC AS POSSIBLE.

I'M A PROFESSOR AT NORTHEASTERN, SPEECH LANGUAGE PATHOLOGY AND AUDIOLOGY AS WELL AS THE COLLEGE OF COMPUTER SCIENCES.

THE RESEARCH IN MY LAB BACK FROM 2007 THROUGH 2014 WAS ON TRYING TO CREATE UNIQUE SYNTHETIC VOICES FOR INDIVIDUALS WHO WERE UNABLE TO SPEAK, MUCH LIKE WHAT JOHN WAS TALKING ABOUT THROUGH VOICE BANKING RATHER THAN MESSAGE BANKING.

WHAT WE WERE INTERESTED IN
ACTUALLY DOING, THOUGH, WAS CREATE A VOICE FOR SOMEONE DID NOT HAVE THE ABILITY TO SPEAK FROM BIRTHMENT WE TOOK A CROWDSPACE APPROACH. WE HAD PEOPLE LIKE YOU AND I CONTRIBUTE THEIR VOICE TO OUR VOICE BANK AND THEN WHAT WE WOULD DO IS TAKE SAMPLES OF THAT PERSON WHO Couldn'T SPEAK, BUT CAN STILL VOCALIZE. THOSE VOCAL STATIONS WOULD THEN BE USED TO LOOK FOR A MATCH WITHIN OUR VOICE BANK OF SOMEONE SIMILAR, AND THEN WHAT WE WOULD DO IS THROUGH THESE TECHNOLOGIES BASICALLY INVERSE FILTER AND REMAP OR MORPH A VOICE SO IT COULD SOUND LIKE IT COULD POTENTIALLY COME FROM THEM. STEVEN HAWKING WOULD HAVE BEEN A GREAT CANDIDATE IF HE THOUGHT HIS DESKTOP VOICE WAS HIS ONLY VOICE. BUT THERE ARE OTHER PEOPLE WHO BENEFITTED FROM THE TECHNOLOGY. THAT'S HOW VOCALID STARTED. 2015-2018 FOCUSED ON INDIVIDUALS NON-SPEAKING, FROM BIRTH AND INDIVIDUAL WHO WERE ABOUT TO LOSE THEIR VOICE. WE DON'T FOCUS ON MUCH ON ALS BUT PEOPLE WITH HEAD AND NECK CANCER. PRIOR TO THEM LOSING THEIR VOICE TO OR BECAUSE EITHER THEIR VOICE BOX WILL BE REMOVED OR PART OF THEIR TONGUE WILL BE REMOVED THEY BANK THEIR VOICE AHEAD OF TIME AND REMEMBER W. HE RECREATE IT. WE'RE ON GENERATION FOUR OF OUR VOICE SYNTHESIS ENGINE, ALLOWS US TO MAKE THE MOST HIGHLY REPFULLY REPLICATABLE VOICE.
THESE ARE DEEP-LEARNING METHODOLOGIES BUT THOSE ARE THE ONLY ONES THAT WORK ON ASSISTIVE TECHNOLOGY DEVICES LIKE JOHN WAS MENTIONING EARLIER. THOSE ARE ALL THE GOODS, RIGHT? THERE'S ALWAYS A PUSH, BECAUSE NOW THAT WE'RE ALSO MAKING VOICES FOR COMPANIES AND ORGANIZATIONS, SO A COMPANY OFTENTIMES WILL HAVE A BRAND VOICE, LIKE REBECCA WAS TALKING ABOUT. AND THAT VOICE TYPICALLY HAS BEEN AN INDIVIDUAL. BUT MANY TIMES TOO THAT INDIVIDUAL MIGHT BE RECORDING THEIR PHONE TREE FOR THEIR IBR SYSTEM. INDIVIDUAL MAY BE DOING E-LEARNING SCRIPTS FOR THEIR CORPORATE TRAINING VIDEOS, SO ON, SO FORTH. SO THIS IS ALL, THE PERSON WHO KNOWS THEY'RE HAVING THEIR VOICE SYNTHESIZED KNOWS THIS IS A WAY TO INCREASE THEIR CAPABILITIES IN TERMS OF BEING ABLE TO SERVE MORE THAN ONE CLIENT AND THEY COULD GET RESIDUALS BACK AND SO ON. I THINK THERE ARE WAYS IN WHICH THIS TECHNOLOGY CAN BENEFIT THE VOICE ACTORS THEMSELVES, THAT THEY DON'T ALWAYS HAVE TO COME BACK AND DO THOSE PICKUPS AND SMALL THINGS THAT CAUSE THEM PAIN AND ANNOYANCES, THEY CAN DO MORE CREATIVE THINGS. BUT IT IS A WORKFORCE ISSUE AS WELL IN TERMS OF DOES IT MEAN IT WILL DISPLACE SOME? YES. ANY NEW TECHNOLOGY WILL HAVE A DISPLACEMENT FACTOR AS WELL. THEN THERE'S THIS UNCANNY VALLEY
PART OF IT WHERE ANY TIME YOU
MAKE A TECHNOLOGY THE, EVERYONE
WANTS TO PUSH TO THE EXTREME OF
WHEN IT STARTS SOUNDING REAL,
CAN YOU MAKE IT SOUND MORE REAL?
MAKE IT WITH MORE MELODY,
EMPHASIS?
EVERYONE WANTS THAT.
THINK ABOUT COMPUTER GRAPHICS.
WE'RE NOT OKAY WITH IT JUST
LOOKING LIKE AN ANIMATION,
WE WANT IT TO BE REALISTIC, THAT
VIDEO GAME TO FEEL LIKE YOU'RE
IN IT, RIGHT?
WELL, WE'RE PUSHING THAT
TECHNOLOGY BUT WHEN WE PUSH THAT
TECHNOLOGY WE'RE ALSO PUSHING
THE ANTE ON WHAT CAN HAPPEN IN
THE REVERSE.
I THINK THAT ONE OF THE
INTERESTING THINGS IS THAT WE
ARE BY VIRTUE OF THIS TECHNOLOGY
ASKING FOR MORE IN THE
TECHNOLOGY ITSELF.
BUT THE GOOD PART OF IT IS THE
POTENTIALLY CAN INCLUDE MORE
DIVERSE POOL OF INDIVIDUALS THAN
WE HAVE SEEN BEFORE.
MIGHT INCLUDE THAT VOICES THAT
ARE BEING HEARD ON THESE NEW
TYPES OF MEDIA, MAY HAVE MORE
DIVERSITY AND ACCENT WHICH WE
DON'T HEAR ON THE RADIO, DON'T
SEE ON TV THAT MUCH.
WE'RE STARTING TO SEE MORE BUT
MIGHT SEE IN THIS EMBEDDED
WORLD.
THERE IS A BENEFIT THAT WAY.
ON THE OTHER END, NEFARIOUS
USES, WITH ANY NEW TECHNOLOGY,
THERE WILL ALWAYS BE NEFARIOUS
USES.
SOME TECHNOLOGIES RACED AHEAD
AND NOT THOUGHT ABOUT NEGATIVE
CONSEQUENCES.
BECAUSE VIDEO CAME FIRST.
WITH AUDIO THERE ARE COMPANIES, INCLUDING OURS, THAT ARE STARTING TO THINK ABOUT WHAT'S OUR ROLE AS THE ORIGINATOR OF THE TECHNOLOGY TO ALSO PUT IN THE SAFEGUARD? YOU KNOW, IF YOU KNOW HOW THE TECHNOLOGY WORKS, YOU'RE ALSO BEST ABLE TO KNOW HOW TO DECODE IT OR HOW TO FIGURE OUT A WAY TO PUT IN SOMETHING SO THAT IT CANNOT BE MISUSED. I THINK THAT REGULATION, SOME OF IT WILL COME FROM US AS WELL. THE OTHER I THINK BIGGEST SAFEGUARD IS AWARENESS. AWARENESS, PEOPLE DON'T EVEN KNOW THAT THIS TECHNOLOGY EXISTS. PEOPLE DON'T KNOW HOW GOOD IT CAN BE. I THINK WE NEED TO START EDUCATING PEOPLE ABOUT THAT AND UNDERSTANDING THIS TECHNOLOGY AND ITS MECHANISMS, HOW CAN IT SPREAD IS AN IMPORTANT PIECE OF PUBLIC AWARENESS AS WELL. IN ADDITION TO THAT, I CAN'T SPEAK FOR THE -- I DO THINK THAT IT IS IMPORTANT TO THINK ABOUT WHAT ALREADY EXISTS IN TERMS OF COMMON LAW TOO, TO PROTECT US. IT'S NOT ONLY LIKE YOU MAKE A NEW LAW FOR THIS NEW TYPE OF TECHNOLOGY WILL BE VERY NARROW. WE HAVE TRIED TO DO THAT SOME OF THE PRIVACY ISSUES. WE HAVE TO THINK ABOUT SOMETHING MORE GENERALLY IN TERMS OF THERE'S WAYS TO PROTECT AGAINST IMPERSONATION FOR EXAMPLE. SO HOW DO WE TAKE THOSE AND APPLY THAT TO THIS NEW TECHNOLOGY? MUCH OF THE THINGS WE'RE TALKING ABOUT HERE ARE NOT NEW, RIGHT?
IMPERSONATION HAS BEEN THERE FOR AWHILE. NOW IT'S MAKING IT EASIER AS PATRICK SAID, ALLOWING US TO SCALE MORE. THE OTHER THING I WOULD SAY IS THERE'S SORT OF AN AGREEMENT AMONG THOSE OF US CREATING NEW SYNTHETIC MEDIAS THAT OUR GOAL IS FOR THIS TO REALLY BE A TECHNOLOGY THAT BRINGS PEOPLE TOGETHER RATHER THAN BEING DIVISIVE. WE KNOW THAT THERE WILL BE BAD ACTORS. HOW DO WE MAKE SURE THOSE BAD ACTORS DO NOT PREVAIL OVER THAT? THAT'S BECAUSE WE'LL PUT IN THESE SAFEGUARD ALONG THE WAY, ALONG WITH ORGANIZATIONS LIKE WORKING WITH THE ACTORS UNION TO MAKE SURE THERE IS FAIR COMPENSATION AND SO ON. BUT THIS IS A GROUP EFFORT. IT CAN'T JUST BE ANY ONE SEGMENT THAT TAKE IT ON. I THINK WHAT IT WILL HAPPEN, IT WILL BE BACKDOORS, WILL BE BAND-AIDS RATHER THAN ACTUAL FIXES OF THE ENTIRE ECOSYSTEM. THANK YOU AND I LOOK FORWARD TO YOUR QUESTIONS. [APPLAUSE] >> MONA SEDKY. >> THANK YOU FOR INVITING ME HERE. SO I AM THE VOICE OF DOOM. I DON'T WANT TO -- I'M AN IN THE TRENCHES FEDERAL PROSECUTOR IN THE COMPUTER CRIME AND INTELLECTUAL PROPERTY SECTION AT DOJ. I DEAL WITH CYBERCRIMINALS ALL DAY LONG AND HAVE FOR ABOUT 15 YEARS. MY SPECIALTY AT DOJ ARE SORT OF
TWO DIFFERENT KINDS OF CYBER CRIME, BOTH OF WHICH ARE FERTILE GROUNDS FOR PEOPLE ENGAGED IN DEEP FAKE AUDIO FOR LACK OF A BETTER WORD.
I DO A LOT OF CASES INVOLVING PRETTY PERNICIOUS CYBER STALKING, NON-CONSENSUAL PORNOGRAPHY, EXTORTION, SEX TORSION AND THINGS LIKE THAT. I DO A FAIR AMOUNT OF ONLINE FRAUD THAT INVOLVES SOCIAL ENGINEERING.
GENERALLY SPEAKING, THE CRIMINAL BUCKETS THAT I DEAL WITH ARE PEOPLE, THERE ARE CRIMES THAT ARE DEPENDENT UPON COMMUNICATION AND THEN THERE ARE CRIMES THAT INVOLVE ALMOST NO COMMUNICATION.
AND COMMUNICATION DEPENDENT CRIMES ARE YOU HAVE THE FOR CRIMINALS BECAUSE FIRST OF ALL, IF CRIMINALS DON'T WANT TO COMMUNICATE WITH THE PUBLIC, THEY DON'T WANT TO COMMUNICATE WITH LAW ENFORCEMENT, THEY DON'T FOR CRIMINALS. FIRST OF ALL, IF CRIMINALS DON'T WANT TO COMMUNICATE WITH THE PUBLIC, THEY DON'T WANT TO COMMUNICATE WITH LAW ENFORCEMENT, THEY DON'T WANT TO COMMUNICATE WITH VICTIMS.
THEY LEAVE FINGERPRINTS ALL THE TIME.
IT'S BAD.
THERE ARE CRIMES YOU HAVE TO COMMUNICATE.
IF YOU'RE THREATENING OR HE CAN TOGETHERING, A HOEBG THREAT OR A REAL THREAT, P YOU'RE TRYING TO DEFRAUD SOMEONE YOU HAVE TO COMMUNICATE WITH THEM AND YOU LEAVE FINGERPRINTS EVERY TIME YOU DO.
THEY DON'T LIKE TO COMMUNICATE BECAUSE IT'S DANGEROUS FOR THEM.
THEY ALSO DON'T WANT TO COMMUNICATE BECAUSE IT'S COSTLY. THOSE FRAUD SCHEMES TAKE A HOT OF TIME.
TIME IS MONEY FOR CRIMINALS. THEY DON'T WANT TO SPEND A BUNCH OF TIME ON THE PHONE LOOKING TO STEAL YOUR MONEY.
HE DON'T WANT TO COMMUNICATE WITH YOU, IT COST THEM TILE AND MONEY.
THIRDLY, THEY'RE BAD AT IT.
IT'S DIFFICULT TO CONVINCINGLY IMPOSE AS SOMEONE ELSE.
ESPECIALLY IF YOU'RE A FOREIGN NATIONAL AND HAVE AN ACCENT.
IT'S VERY DIFFICULT TO KHAOUPB KATE WITH A CRIME VIC TUPL AND CON SRUPBS THEM YOU ARE SOMEONE ELSE.
FOR THESE THOUGH REASONS REALLY COMMUNICATION FOCUSED CRIME IS, HAS HISTORICALLY BEEN LOWER ON THE TOTUM POLL.
NOW WITH DEEP FAKE AUDIO, AMNON AMNONMIZIG TOOLS.
YOU CAN COMMUNICATE ANONYMOUSLY WITH PEOPLE ANYWHERE FROM THE WORLD.
THERE IS A UPTICK ON COMMUNICATION FOCUSED CRIME.
TO BE THE VOICE OF DOOM.
I'M A IN-THE-TRENCHES PROSECUTOR.
I DON'T DO THE SOCIETY COST BENEFIT A MAL SIS.
IT'S FANTASTIC TO HAVE THIS.
IT'S EASY TO BE IN THE DARK SPACE I WORK TO ENVISION ALMOST GUARANTEED CRIMINAL USE OF THIS TECHNOLOGY GO.
LET ME GIVE YOU A FEW EXAMPLES.
THERE WILL BE THREATS AND HARASSMENT FOCUSED CRIMINALS THAT WILL LOVE THIS TECHNOLOGY GO AND FRAUD BASED CRIMINALS
THAT WILL LOVE THIS TECHNOLOGY
GO.
FOR THE THREATS AND HARASSMENT
FOCUSED CRIMINALS HERE ARE A
COUPLE SCENARIOS.
I PROSECUTE CYBER STALKERS.
THEM POSE AS THEIR VICTIMS AND
PUT UP BASICALLY RAPE FANTASY
ADVERTISEMENTS OR COME HITHER,
COME RAPE ME, BDS SOLICITATIONS
ON BE HALF OF YOUR VICTIM.
NOW YOU POST HER PHOTOGRAPH,
VIDEO, ADDRESS AND WORK PLACE.
YOU KNOWS AS HER AND CALL PEOPLE
TO ESSENTIALLY IT'S RAPE BY
PROXY.
COMMON PATTERN.
IF YOU HAVE VIDEO.
IF YOU CAN ALSO MIMIC HER VOICE
TO CONVINCINGLY INVITE PEOPLE TO
HER HOME FOR THIS GANG BANG,
EXCUSE MY FRENCH OR WHATEVER
IT'S NOT FRENCH, IT'S A ENHANCED
TOOL FOR CYBER STALKERS.
I ALSO PROSECUTE WHAT WE CALL
SEXTORTION.
IT'S ANOTHER FORM OF CYBER
STALKING.
THE OFFENDER TRIES TO CREATE
FAKE EXPLICIT SEXUAL IMAGES OR
STAET SEXUAL EXPLICIT IMAGES
THAT LOOK LIKING THE VICTIM.
THEY THEN COMMUNICATE WITH THE
VICTIM AND SAY IF YOU DON'T SEND
ME NAKED PHOTOS EVERYONE IN THE
WORLD WILL SEE THIS IMAGE.
DEEP FAKE AUDIO COULD BE USED IN
SORT OF TANDEM WITH DEEP FAKE
VIDEO TO CREATE A REALISTIC
SEXUALLY EXPLICIT VIDEO TO BE
USED BACK TO THE VICTIM AND SAY
IF YOU DON'T GIVE ME REAL
CONTENT BY MIDNIGHT TONIGHT THIS
DEEP FAKE IS GOING ALL OVER THE
INTERNET.
CONVERSELY IMAGINE IF YOU COULD
POSE AS YOUR VICTIM'S SENT MATE PARTNER.
YOU COULD CALL YOUR VICTIM AND EASILY SPOOF THE TELEPHONE NUMBER OR SPOOF THE E-MAIL ADDRESS AND CALL AS A FOLLOW-UP AND SAY MAY SENDER ME SEXUALLY EXPLICIT IMAGES OF YOU, THEY WOULD USE DIFFERENT LANGUAGE FROM WHAT I SAID JUST. THEY WOULD CONVINCE THEIR VICTIM TO TURN OVER SEXUALLY EXPLICIT IMAGES, OTHER PERSONAL A DEPARTMENT FIA BLE INFORMATION, PERHAPS PASSWORDS TO THEIR ACCOUNTS. THAT WOULD BE USED TO FURTHER EXPLOIT THE VICTIM.
WHAT THEY'RE HOPING IS THAT THERE WILL BE SOME KIND OF CON PROP STATION WITH LAW ENFORCEMENT AND THE VICTIM. IF YOU HAVE A CONVINCING DEEP FAKE AUDIO YOU CAN EASILY SWAT YOUR VICTIM IN A CONVINCING WAY. APPROACH IT'S A SMALL TOWN AND THEY KNOW YOUR VOICE.
IT CAN BE WEAPONIZED IN THE CYBER WORLD AGAINST VICTIMS. THE BEAUTY OF SOMETHING LIKE DEEP FAKE AUDIO IS IT'S EMINENTLY SCALABLE.
BACK TO THE COST OF ONE-ON-ONE COMMUNICATION WITH SOMEONE. YOU CAN CLICK A BUTTON AND DO A MASSIVE AMOUNT OF IMAGE.

THE FRAUD CONTENT SUP.
I WILL GIVE YOU THE TEN SECOND -- THE FRAUD SCENARIOS ARE PRETTY OBVIOUS. THESE ARE YOUR GRANDPARENT SCAMS. WE CALL THEM BUSINESS E-MAIL COMPROMISED. BECs PROBABLY THE SINGLE
LARGEST FINANCIAL INJURY OF ALL
COMPUTER CRIME RIGHT NOW.
CLASSIC SCENARIO YOU'RE A
UNIVERSITY.
I SEND YOU A FAKE PHISHING
E-MAIL PRETENDING TO BE THE
CONSTRUCTION COMPANY.
I SAY THE BANK ACCOUNT HAS
CHANGED PLEASE WIRE FUNDS TO THE
NEW BANK.
IF I CAN FOLLOW-UP A FAKE SPEAR
TPHISHING E-MAIL WITH A PHONE
CALL IT'S HUGE DOLLAR LOSSES
INSTANTLY.
VOICE ENHANCED BECs
COMPROMISES WILL BE VERY VERY
FRUIT FULL.
FUL.
SO MY VOICE OF DOOM HERE IS,
THIS TECHNOLOGY IS FANTASTIC.
JUST LIKE THE INTERNET CAN BE
WEAPONIZED AGAINST PEOPLE.
DOESN'T MEAN WE SHOULDN'T HAVE
THE INTERNET BUT THESE ARE
THINGS TO THINK ABOUT.
EXACTLY WHAT RUPAL WAS SAYING
THERE ARE THINGS TO BAKE IN ON
THE FRONT END TO MAKE IT HARDER
TO WEAPONIZE AGAINST PEOPLE.
THANK YOU AGAIN FOR INVITING ME.
>> THANK YOU, VERY MUCH.
I WANT TO ADDRESS THE FIRST
QUESTION TO RUPAL.
WE HAVE TALKED ABOUT A COUPLE OF
DIFFERENT TYPES OF TECHNOLOGY.
MESSAGE BANKING.
.SYNTHETIC VOICE AND VOICE
CLONING.
CAN YOU GIVE US A BRIEF OVER
VIEW OF EACH TECHNOLOGY.
>> SURE MESSAGE BANKING IS WHEN
YOU PRESTORE MESSAGES LIKE VOICE
MEMOS ON YOUR PHONE OR WHATEVER.
YOU CAN REPLAY THOSE MESSAGES.
WHAT JOHN IS TALKING ABOUT IS A
WAY FOR PEOPLE WITH DISABILITIES
TO ACTUALLY HAVE THESE IN ANARCH
ANARRAY TO FIND THEM AND MAY THEM
BACK.
SYNTHETIC VOICE IS WHEN YOU HAVE
A BUNCH OF RECORDINGS AND USE
THOSE TO MACHINE WISE RECREATE A
VOICE.
THERE ARE MANY TECHNIQUES OF
SYNTHETIC SPEECH INCLUDING WHAT
WAS SAID EARLIER IN TERMS OF
TRYING TO CREATE VOICES WHERE
YOU GLUE TOGETHER SEGMENTS OF
SPEECH.
THE NEWEST METHOD IS USING
MACHINE LEARNING TECHNIQUES.
AI IS THE MOST ADVANCE OF
SYNTHETIC VOICE.
AI IS A METHOD USED, DEEP
LEARNING IS USED TO CREATE THESE
VOICES.
IT'S A SYNTHETIC VOICE AT THE
END OF THE DAY.
WE CALL IT AI IT'S USED WITH
DEEP LEARNING RATHER THAN
GLUEING TOGETHER PIECES OF
SPEECH.

>> ARE THERE PARTICULAR BENEFITS
OF CLONED VOICES VERSUS
SYNTHETIC VOICES AND MESSAGE
BANKING?

>> VOICE CLONING.
SO THINK ABOUT SIRI RIGHT.
A VOICE ACTOR, SUSAN BENNETT,
THE VOICE BEHIND SIRI.
SHE RECORDED FOR HOURS AND
HOURS.
THOSE WERE CUT INTO SNIPPETS OF
SPEECH AND COMBINATIONS OF
HOSES.
IT ALLOWS FOR US TO TYPE
ANYTHING IN AND SAY THINGS SHE
DIDN'T NECESSARILY SAY.
SYNTHETIC VOICE, THE POINT IS
IT'S GENERATED.
YOU CAN TYPE IN ANY NOVEL PHRASE
AND CREATE, GENERATE AUDIO FROM
IT.
RIGHT.
SO THE PROBLEM WITH OLDER METHODOLOGIES IS IT'S SO EXPENSIVE TO BUILD AND YOU NEED SO MUCH TIME OF THE VOICE ACTOR OR SOMEONE IN CLEAN STUDIO RECORDINGS TO CREATE THAT KIND OF A VOICE.
IT'S VERY EXPENSIVE.
BANK OF AMERICA MADE A VOICE RECENTLY, MILLIONS OF THRARZ.
YOU KNOW IT'S OBVIOUSLY MADE WITH LOTS AND LOTS OF TIME.
THE NEWER METHODOLOGIES THAT PAT YOU CAN TRAYNOR DESCRIBED YOU DON'T NEED THIS WITH THE SENTHETIC METHOD OL TPWAES YOU TAKE A ENTIRE RECORDING BASE ABOUT A THOUSAND SENTENCES. ABOUT AN HOUR OF SPEECH.
YOU RECREATE A VOICE.
I GUESS YOU CALL THAT VOICE CLONING.
WE CALL IT A SYNTHETIC VOICE BECAUSE YOU WANT TO SOUND LIKE THAT PERSON.
NOW YOU CAN USE THAT FOR A MULTITUDE OF DIFFERENT OPTIONS.
THE POINT IS YOU CAN TYPE IN THINGS AND GENERATE THE AUDIO WHICH WASN'T SAID BEFORE. WASN'T PRERECORDERED.
>> OKAY.
JOHN, DO YOU HAVE ANYTHING TO ADD ON THAT FROM THE PERSPECTIVE OF THE PATIENTS THAT YOU WORK WITH?
>> I THINK TO YOUR QUESTIONS ABOUT THE VALUE OF THE MESSAGE BANKING AS YOU SAW IN THE VIDEO, THE POWER OF HAVING THAT AUTHENTIC REPRESENTATION OF EXACTLY WHAT YOU WANT TO SAY AND HOW YOU WANT TO SAY IT IS IMPORTANT.
FROM THE VOICE BANKING SIDE THE
PEOPLE WHO YOU HEARD AND SOME OF
WHO YOU MET IN VIDEO RECORDED UP
TO A THOUSAND MESSAGES.
THIS TOOK A BIT OF TIME.
THEY DID THAT FUNCTIONALLY
OVERTIME.
THEN THAT BEING INTEGRATED WITH
OUR SITE AND WITH ACAPELLO IT
WAS HELPFUL FOR MANY PEOPLE.
NOW PEOPLE LOSING THE ABILITY TO
SPEAK HAVING THAT CUSTOM
SYNTHETIC VOICE IT'S ATTAINABLE
FOR SOMEONE SO VULNERABLE.
>> HOW WIDE SPREAD WOULD YOU SAY
THE TECHNOLOGY IS BEING USED NOW
BY PEOPLE WHO HAVE LOST THE
ABILITY TO SPEAK?
>> I WOULD SAY THAT THE IDEA OF
VOICE BANKING HAS REALLY COME IN
TO IT'S OWN EVEN IN THE PAST
COUPLE OF YEARS AS SOME OF THE
TECHNOLOGY HAS BECOME BETTER AND
BETTER.
CERTAINLY IN THE WORLD OF ALS
THERE IS A GREAT DEAL OF
INTEREST IN AWARENESS OF THIS
NATIONALLY AND INTERNATIONALLY.
WHERE AS IF YOU SPOKE WITH
SOMEONE FROM A CLINIC THREE OR
FOUR YEARS AGO THEY WOULD
SUGGEST IT WAS THE A GOOD OPTION
FOR MOST PEOPLE BECAUSE THEY
DIDN'T UNDERSTAND HOW EASY OR
AFFORDABLE IT WAS.
I THINK NOW IT'S STANDARDLY
RECOGNIZED, CERTAINLY IN THE
DISABILITY WORLD AS AN OPTION TO
CONSIDER.
>> AND REBECCA FROM YOUR
PERSPECTIVE HAVE YOU SEEN
INSTANCES WHERE THIS IS USED
WITHOUT CONSENT?
>> WE ACTUALLY HAVE.
A LOT OF TIMES IT'S ALSO
COMBINED IN VIDEO.
THERE WAS A PARTICULAR PERSON WHO WAS INSERTED INTO A VIDEO, A BROADCASTER WE WERE TALKING ABOUT THIS EARLIER. THEY MADE THEIR LIVING AS A SPORTSCASTER AT A PARTICULAR KIND OF EVENT DOING THE SAME KIND OF THING. THEY WERE INSERTED INTO A VIDEO GAME WITHOUT THEIR KNOWLEDGE AND WITHOUT THEIR CONSENT. THAT WAS A WAY THAT, THAT WAS THAT PERSON'S LIVELIHOOD AND CAREER, THEIR WHOLE TRAINING, THEIR WHOLE ABILITY -- IT WAS THEIR BRANDIE SENSUALLY. IT WAS INSERTED. THOSE ARE THE KINDS OF THINGS AS WE GO FORWARD, OBVIOUSLY THERE ARE THINGS WE CAN CONTRACTUALLY DO IN CERTAIN SITUATIONS. THAT'S WHY THE LEGISLATION PIECE IS SO IMPORTANT AND CRITICAL. THERE ARE NOT ALWAYS ETHICAL PLAYERS IN THE MIX.>> AT THE TIME THAT HAPPENED WAS THIS TECHNOLOGY NOT AS WIDELY KNOWN? >> I THINK FOR EVERYBODY THIS IS MOVING SO QUICKLY PEOPLE ARE NOT AS FAMILIAR WITH HOW IT HAPPENS. I DO TALK TO PEOPLE IN THE GOVERNMENT BOTH ELECTED AND OTHERWISE WHO ARE NOT AS FAMILIAR WITH WHAT THIS MEANS AND THE USES FOR IT. I AM OFTEN IN THE MIDDLE OF A MEETING. I'M LIKE I IMMEDIATE TO SHOW YOU OR MAKE YOU HEAR WHAT I'M TALKING ABOUT TO MAKE THAT KNOWN. AS THIS TECHNOLOGY IS GETTING BETTER AND BETTER AND THE DIFFERENCES ILLUSTRATED EARLIER BY PATRICK ARE PERFECT EXAMPLES
HOW QUICKLY THIS REALLY MOVES.
WE'RE INCREASINGLY MORE CONCERNS
ABOUT IT.
>> MONA, HAVE YOU SEEN ANY
INSTANCES WHERE THIS TECHNOLOGY
HAS BEEN USED?
>> NO, I HAVEN'T.
I HAVE SEEN REAL LIFE
APPLICATIONS OF DEEP FAKE VIDEO.
IT DIDN'T HAVE DEEP FAKE AUDIO
IN THE CONTEXT OF A PRETTY
PERNICIOUS SEXTORTION CAMPAIGN.
I WANT TO HIGHLIGHT THE DAMAGE
THAT CAN BE DONE.
PUT AGO SIDE FRAUD AND FINANCE
LOSS.
I CAN'T BEGIN TO DESCRIBE THE
LIFE-LONG DAMAGE THAT IS DONE
WHEN A EITHER REAL OR DEEP FAKE
VIDEO WITH OR WITH OUT AUDIO
GETS OUT FOR WHAT ARE OFTEN
YOUNG PEOPLE IN VERY VULNERABLE
TIMES OF THEIR LIVES ALREADY.
EVEN IF THREE NANOSECONDS LATER
IT'S DEBUNK AS A FAKE IT DOESN'T
MATTER THOSE PEOPLE.
THOSE IMAGES CAN'T BE CLAWED
BACK.
NINE OUST TIMES I INTERVIEW
VICTIMS AND WE'RE GETTING READY
FOR A SENTENCING MY VICTIMS ARE
MORE CONCERNED ABOUT GETTING
THEIR CONTENT OFF THE INTERNET
THEN THEY ARE ABOUT HOW LONG
THIS GUY WILL BE IN JAIL.
YOU KNOW THE, THERE ARE REPORTS
OF AUDIO, DOPE FAKE AUDIO BEING
USED IN A BEC TYPE BUSINESS
E-MAIL TYPE SCAM.
I DON'T KNOW FOR SURE.
I HAVE NO FIRST HAND KNOWLEDGE
WITH THAT.
WHEN IT'S FINANCIAL ARGUABLY YOU
GET YOUR MONEY BACK.
IN THIS OTHER HARASSMENT CONTEXT
YOU'RE FIRED FROM YOUR JOB, YOUR
PERSONAL RELATIONS WILL OVER.
YOUR PRIVACY IS FOREVER VIOLATED.
THAT GENIE CAN'T BE PUT BACK IN
THE BOTTLE EVEN IF IT'S EXPOSED
AS A DEEP FAKE IN FAIRLY SHORT
ORDER.

>> OKAY.
>> RUPAL, I THINK YOU MENTIONED
THE TECHNOLOGY CAN BE COSTLY IN
CERTAIN INSTANCES.
DO YOU THINK COST IS A DETERRENT
FOR BAD ACTORS TO USE THE
TECHNOLOGY?

>> NO, THE COST IS A FRACTION OF
THE COST IT USE TO BE.
I ACTUALLY THINK PART OF THE
ISSUE TOO IS THERE IS SO MUCH
OPEN SOURCE TECHNOLOGY AVAILABLE THESE DAYS.
IT'S GOOD.
THERE IS AN ADVANCEMENT OF
TECHNOLOGY WITH THE OPEN SOURCE
MOVEMENT.
IT ALSO MEANS YOU DON'T KNOW WHO
ACT SEXER EVERYONE HAS ACCESS.
PEOPLE PICK UP FRAGMENTS AND
START TO USE THESE CODE BASES.
OPEN SOURCE ISN'T A RECIPE ON
HOW TO MAKE A SYNTHETIC VOICE.
YOU HAVE TO KNOW SOMETHING ABOUT
THE TECHNOLOGY ITSELF.
IT DOESN'T TAKE ALL THAT MUCH
TIME.
IF YOU'RE DETERMINED, LIKE YOU
SAID FRAUDSTERS ARE DETERMINED
TO FIGURE THIS OUT.
THEM WILL FIGURE OUT HOW TO DO
THIS.
I DON'T THINK IT'S COST OR
ACCESS.
FRANKLY IT'S NOT EVEN AUDIO.
THERE IS SO MANY AUDIO ON THE
INTERNET NOW.
ANYONE OF US.
IN FACT YOU'RE TAPING THIS
RIGHT.
THERE IS SO MUCH AUDIO FOR MANY
PEOPLE WHO, WHO OFTEN GIVE
TALKS.
IT'S CLEAN AUDIO TOO.
THAT AUDIO IS THEN AVAILABLE.
LIKE WE HAVE BEEN TALKING ABOUT,
YOU ONLY NEED A LITTLE BIT TO
THEN GET SOMETHING CLOSE ENOUGH.
THEN AS YOU BUILD THE MODEL YOU
CAN ADD MORE DATA TO IT AS WELL.
RIGHT.
I DON'T, I THINK THERE ISN'T --
I DON'T THINK THIS ARE BARRIER
COSTS OR ACCESS ANYMORE.
>> ARE COMPANIES THINKING ABOUT
WHETHER OR NOT TO RELEASE THE
TECHNOLOGY THROUGH OPEN SOURCE
CODE BECAUSE OF THE CONCERNS
THAT COSTS MAY NOT BE A BARRIER?
>> MEANING IF YOU BUILD THE
TECHNOLOGY -- SO, I THINK THERE
IS DEFINITELY A BIG OPEN SOURCE
MOVEMENT.
THERE ARE SOME THINGS THAT MOST
COMPANIES WILL STILL KEEP PRO
PRIETARY BECAUSE YOU DON'T
HAVE EVERYTHING OPEN SOURCED
UNLESS YOU ARE A OPEN SOURCE
COMPANY COMPLETELY.
THIS ARE THINGS YOU DO,
OTHERWISE SOMEONE CAN DO WHAT
YOUR ART IS.
I THINK THAT ONE OF THE THINGS
IS YOU DON'T ALSO WANT TO PATENT
EVERYTHING.
AGAIN YOU TELL PEOPLE HOW TO DO
SOMETHING.
SO THERE IS, IT'S A TRICKY
INTELLECTUAL PROPERTY ISSUE.
YOU HAVE TO WORK AROUND, WELL
WHO DO YOU WANT TO HAVE ACCESS
TO THIS?
HOW DO YOU WANT TO PROTECT IT?
HOW DO YOU WANT TO PROTECT YOUR
OWN INTELLECTUAL PROPERTY?
HOW DO YOU MACH SURE IT'S NOT REVERSED ENGINEERED.
IT'S COMPLICATED AND NOT A SIMPLE SOLUTION TO WORK.
>> OKAY.
JOHN, DO YOU FIND THAT COST IS A FACTOR IN YOUR PATIENT'S DECISION TO USE THE
TECHNOLOGY?
>> CURRENTLY COST HAS BEEN A MINIMAL DECISION.
IN PART BECAUSE AS THE IMPORTANCE OF THE TECHNOLOGY HAS BECOME SO EVIDENT THERE ARE A THOUSAND ORGANIZATIONS THAT HAVE STEPPED UP TO COVER THE COST FOR PEOPLE WHO ARE AT RISK OF LOSING THEIR ABILITY TO SPEAK.
THE COST HAS CONSIDERABLY DROPPED.
WHERE THE VOYAGES HEARD FROM ACAPELA COSTS UPWARDS OF A THOUSAND DOLLARS THEY'RE NOW CHARGING A HUNDRED DOLLARS A YEAR TO CREATE THE VOICE OVER TEN YEARS.
AT THE END OF TEN YEARS IT'S DONE.
WITH THAT THERE ARE PHILANTHROPIC ORGANIZATIONS.
FOR EXAMPLE TEAM GLEASON OUST NEW ORLEANS FOUNDED BY STEVE GLEASON A STORMER NFL PLAYER, THEY COVER THE COST OF VOICES FOR PEOPLE WITH ALS.
>> I WANT TO SWITCH THE CONVERSATION TO THE PRIVACY IMPLICATIONS OF THE TECHNOLOGY.
JOHN, YOU MENTIONED SOME OF THE PATIENTS USING THE TECHNOLOGY FEE ARE NOT WORRIED ABOUT THEIR VOICE LIVING IN PER I STEW IT BUT THEY WANT TO MAKE SURE CERTAIN MESSAGES ARE MAINTAINED FOR FAMILY MEMBERS.
IS PRIVACY DISCUSSED WITH PEOPLE?

>> YES PRIVACY IS DISCUSSED WHERE THE RECORDINGS ARE STORED, WHO HAS ACCESS, THE SIGN-ON CREDENTIALS FOR THAT. THEN WHEN A VOICE IS CREATED AGAIN HAVING CREDENTIALS CONTROLLED BY THE PATIENT AND MAKING SURE THAT THEY'RE FULLY IN CONTROL OF WHO HAS ACCESS TO THAT.

TO YOUR QUESTION AS WELL MANY PATIENTS HAVE INDICATED SOMETIMES AT THE FIRST TIME MOATING THEM AS THEY THINK ABOUT THE POTENTIAL OF HAOZING THE ABILITY TO SPEAK THAT THEY WOULD LIKE TO MAKE SURE IF OR WHEN THEY PASS AWAY THAT MESSAGES THEY HAVE BANKED ARE ACTUALLY AVAILABLE TO THEIR LOVED ONES. BECAUSE OF COURSE THEY'RE OFTEN THINKING ABOUT ALSO LEGACY MESSAGES PEOPLE HAVE UP FRONT IN PERPETUITY.

THERE HAS BEEN LESS INTEREST. TO DATE I DON'T BELIEVE ANYONE HAS ASKED ME TO MAKE SURE THEIR SYNTHETIC, CUSTOM SYNTHETIC VOICE IS AVAILABLE. INSTEAD THEY WANT SPECIFIC DIRECTIVE MESSAGES ARE PRESERVED FOR LOVED ONES.

>> WE HAVE A NUMBER OF CASES WHERE THE SPOUSES AFTER A PATIENT HAVE PASSED AWAY HAVE WANTED THEIR VOICES. THEY, THEY REALLY WANT TO USE THAT VOICE AFTER AS A WAY TO REMEMBER THAT PERSON. IT DOES MAKE ME WONDER ABOUT THINGS LIKE OTHER TYPE OF CRIMES. INSURANCE CRIMES. YOU KNOW COULD YOU KNOWS -- AS
I know that many of these people. You think they wouldn't do things like that. You have to start thinking about how do you, this person is grieving. How do you make sure, you're not creating a back door for other issues. They're embedded technology goes as well. The voices are older and maybe won't fool anyone. But the march of technology is moving forward and two years from now I may not feel that way. We have to think about the negative consequences down the road even though people are asking out of something that seems so benign and so worth while to support. How do we know that someone in the family won't get access to that euphlt phone or how many devices can you download it on, right. Then what would happen with that. It's something I'm scrapping my head about these days. It's something we don't anticipate.

I suspect the difference in our experience is because many of our patients up front have created messages that are already kind of preconstructed and that's what is important to people. So interestingly because families have that. They don't ask for the voice.
BECAUSE THEY HAVE THE HEARTFELT MESSAGES IN HAND. THAT MAKES PERFECT SENSE. 

>> I'M THE VOICE OF DOOM HERE. THINK OF -- IF YOU THINK I WON'T TALK TO PEOPLE ON THE PHONE I DON'T KNOW. PEOPLE CAN'T CALL ME AS A PRANK CALL TO RECORD ME. JUST HAVING SIR A TIPPOUS RECORDING DEVICES. THEY'RE HIGH QUALITY. THEY'RE EASY TO HIDE. YOU CAN STAND NEAR SOMEONE WHILE THEY'RE HAVING A CONVERSATION WITH SOMEONE ELSE AND GET YOUR SEGMENT THAT NEED FOR A HIGH QUALITY DEEP FAKE AUDIO OF THEM. 

>> YES. I THINK ABOUT THE ACTS ARE, THE TRUSTED FACES THAT YOU HOOK AT. YOU LOOK AT A PERSON, MAKING A CHOICE WHAT YOU DO OR NOT DO, THE BROADCASTERS, PUBLIC POLITICIANS, PUBLIC OFFICIALS OUT THERE. PUT THAT IN THE POSSIBILITIES OF SOMEONE AND WHAT THEY CAN DO. IF ONE OF THOSE PEOPLE ARE GIVING ADVISOR DIRECTIVE ON SOMETHING. IT MAY SEEM BENIGN. I THOUGHT WHEN MONA TALKED EARLIER WHAT IF ONE OF OUR MEMBERS ASKED FOR DONATIONS TO X CAUSE IN A DISASTER. NOW YOU HAVE THE VOICE AND MAYBE A DEEP FAKE VIDEO OF SOMEONE ASKING YOU TO DONATE TO THE CAUSE. THESE ARE NOT THE THINGS PEOPLE ARE OFTEN THINKING ABOUT. WE THINK ABOUT IT IN THOSE WAYS OF SECURITY. IF YOU'RE THE PERP MAKING YOUR LIVING DOING THAT THEN YOU'RE
NOT A TRUSTED FIGURE THE NEXT TIME YOU DO IT.
PEOPLE SPEND LIVES BUILDING UP THOSE CAREERS AND TRUST WITH THE PUBLIC.
THEN IT'S GONE AND YOU CAN'T CLAW IT BACK.
>> CAN I PLAY DEVIL'S ADVOCATE ON THE OTHER SIDE.
THERE ARE ARTISTIC AND ENTERTAINMENT APPLICATIONS AS WELL.
THINK ABOUT TAKING A MOTIVATIONAL -- TAKE EINSTEIN.
IF YOU HAVE GREAT AUDIO OF EINSTEIN AND YOU CAN CREATE A PHYSICS, YOU KNOW, TUTORIAL OR EDUCATIONAL APPLICATION AROUND EINSTEIN, NOBODY BELIEVES HE'S STILL HERE.
YOU'RE NOT TRYING TO FOOL ANYONE.
IT'S INSPIRATIONAL.
THERE ARE ARTISTIC ELEMENTS WHERE YOU THINK ABOUT THE USE OF VOICE AND TECHNOLOGY IN INTERESTING WAYS.
WE HAVE PROJECTS NOW WE'RE BEING ASKED TO BRING BACK TO LIFE CERTAIN CHARACTERS.
IT'S JUST THE WAY WE THINK AND MEMORIALIZE SOME OF AS WELL.
THERE IS DEFINITELY THE DOOM STUFF.
THIS IS ALSO SOME OF THE THINGS THAT CAN BE INSPIRATIONAL.
IF YOU'RE LOOKING AT EDUCATIONAL APPLICATIONS WE DON'T HEAR DEMOGRAPHIC DIFFERENT VOICES IN THOSE.
WHAT DOES IT MEAN TO THOSE COMMUNITIES?
THAT THEY'RE NOT REALLY HEARD.
IF YOU HAVE VOICES THAT REPRESENT PEOPLE THAT THE TECHNOLOGY SOUNDS LIKE, THAT'S
GREAT.
MAYBE THERE IS AN ADOPTION AND
TRUST IN A DIFFERENT WAY.
THIS ARE TWO SIDES TO LOOKING AT
THIS.
LET'S NOT GET TOO DOWN THE
RABBIT HOLE THAT IT'S ALL GOING
TO POT.
>> I DON'T THINK -- I DON'T KNOW
MAYBE MONA SAYS IT IS.
I THINK THIS ARE EXAMPLES OF
PEOPLE WHO HAVE MADE DIRECTIVES
AND THE LAWS DIDN'T CATCH UP
WITH IT.
PRINCE DIDN'T WANT TO BE A
HOLOGRAPHIC PERFORMER.
NOBODY WOULD DOUBT THE ARTISTIC
EXPRESSION OF PRINCE AND THE
BEAUTY OF THAT.
IT TOOK AN OUTCRY FROM PEOPLE TO
SAY THAT'S NOT ACCEPTABLE.
THE QUESTION IS, SHOULDN'T IT BE
PEOPLE'S ESTATES.
SHOULDN'T PEOPLE BE ABLE TO MAKE
THOSE CHOICES FROM A POSTMORTEM
RIGHT OF PUBLICITY TO MAKE THOSE
DECISIONS AND OTHERS ARE NOT
MAKING THE DECISIONS FOR PEOPLE.
I THINK THAT'S PART OF A UPON
ANSWERRIZATION.
IT CAN BE WONDERFUL WHEN, HEY, I
LOVED TO GET SEEING CARRY FISHER
ONE MORE TIME AS A STAR A WARS
FAN.
THAT WAS DONE WITH CONSENT.
WHAT ARE THE APPROPRIATE TENS
AND CAN WE WORK WITH ETHICAL
PLAYERS TO DO IT.
IF THE ANSWER TO THAT IS YES,
THEN THAT'S A FANTASTIC THING.
>> I THINK JUST TO FIND THE
COMMON GROUND BETWEEN WHAT YOU
ARE BOTH SAYING.
I THINK YOU HAVE BOTH DISCUSSED
THE ISSUE OF CONSENT.
WHICH LEADS ME TO MY NEXT
QUESTION DEALING WITH NOT DORISMENTS.
SO YOU TALKED EARLY ABOUT EX EX CLUE CYST AND CON TRAPBTS.
--

>> YES.
IF YOU'RE THE VOICE OF A FAST FOOD CHAIN AND THEN THE COMPETITOR THE NEXT DAY CAN TAKE YOUR VOICE AND MAKE YOU THEIR VOICE AS WELL.
YOU HAVE DIMINISHED THE VALUE OF THE PERFORMER BUT ALSO THE BUSINESS WHO HAS INVESTED THE TIME AND MONEY.
THERE ARE MANY SITUATIONS WE HAVE TO HAVE AWARENESS OF THAT.
THE WONDER OF BEING ABLE TO -- MAYBE ARE YOU THE VOICE AND THROUGH TECHNOLOGY AND CONSENT YOU CAN EXPANDED.
PAEB THE HIGH PROFILE PERFORMER ISN'T GOING TO DO THE PHONE TREE.
MAYBE NOW THEY WILL.
THERE IS AN EXCITING SPACE IN THIS WHOLE WORLD WE'RE EXCITED ABOUT THE VOICE FIRST TECHNOLOGY IN TERMS OF APPLICATIONS AND OTHERWISE.
THAT TO ME IS AMAZING.
THERE IS WONDERFUL POTENTIAL THERE.
IT HAS TO BE SOMETHING WE'RE DOING THE DOPE DIVE TO MAKE SURE THIS IS THE PRECAUTIONS.
WHOLE BUSINESS MODELS NEED TO BE PROTECTED UNDER THAT.
>> MOAN A I CAN SEE FROM A LAW ENFORCEMENT PERSPECTIVE TOO.
IF A PARTICULAR INDIVIDUAL'S VOICE IS USED TO ENDORSE A PRODUCT OR SERVICE OR SOMETHING THAT COULD CREATE LAW ENFORCEMENT CHALLENGES.
ALSO CONCEPTIONS FROM CONSUMERS
PERSPECTIVE AS TO WHO IS SUPPORTING.
>> ABSOLUTELY.
YOU CAN COP COME UP WITH A STOCK MARKET MANIPULATION SCENARIO.
YOU HAVE SOMEONE POSING AS THE CEO OF A COMPANY MAKING A BOGUS EARNINGS CALL TO MANIPULATE THE STOCK PRICE.
THAT WOULD BE WIRE FRAUD AND A NUMBER OF SECURITY REGULATIONS.
CONVERSELY YOU COULD HAVE A COMPETITOR BASICALLY SABOTAGE ANOTHER COMPETITOR SIMILAR TO WHAT REBECCA SAID.
POSE AS THE COMPETITOR CEO AND MAKE FALSE NEGATIVE CLAIMS ABOUT THE COMPANY.
THE MARKET WOULD RESPOND INSTANTLY.
MAYBE THE INFORMATION WOULD FINALLY COME TO LIGHT IT WAS A FAKE CALL.
MAYBE THE MARKETS ULTIMATELY RECOVER.
IN THE MEANTIME MASSIVE AMOUNTS OF SHAKING THE CONFIDENCE OF THE MARKETPLACE HAS HAPPENED.
NOT TO MENTION PRESUMABLY WHO IS SHORT OF THE STOCK HAS MADE A FORTUNE.
IT'S LESS CLEAR TO ME QUITE FRANKLY WHETHER MERELY TAKING SOMEONE'S VOICE WITHOUT AUTHORIZATION, YOU KNOW RIGHT NOW THE STATUTES THAT COME TO MIND.
I'M PROBABLY WAY INTO THE WEEDS NOW.
WE HAVE 18 USC TURN 29 THE UNAUTHORIZED USE OF A ACCESS DEVICE AND THEN WE HAVE ONE FOR A MEANS OF IDENTIFICATION.
QUERY WHETHER SOME ONE'S VOICE WOULD BE ACCESS DEVICE OR MEANS OF IDENTIFICATION PARTICULARLY IF IT WAS USED IN A BIO MET I CAN UNLOCK CONTEXT. IF YOU HAVE AN ACCOUNT AND ONE PRIMARY WAY, A BIOMETRIC LOCK IS YOUR VOICE. YOU COULD HAVE SOMEONE POSE AS YOU AND STEAL YOUR MONEY. THOSE SCENARIOS ARE COVERED ONCE THEY ACTUALLY MISUSE THE VOICE EXEMPLAR. THE QUESTIONING IS IT A CRIME TO ACQUIRE WITHOUT AUTHORIZATION SOMEONE'S VOICE EXEMPLAR IN THE FIRST INSTANCE. I THINK THAT'S A MORE OPEN QUESTION. >> HOW HAVE YOU ALL SEEN THE TECHNOLOGY CHANGE. WE HAVE TALKED ABOUT HOW RAPIDLY THE TECHNOLOGY HAS CHANGED THE LAST COUPLE OF YEARS. HOW HAS IT AFFECTED YOUR EXPERIENCE WITH THE TECHNOLOGY AND PEOPLE USING IT? >> SO, I CAN SAY THAT WITH THE AVAILABILITY OF DNN TECHNOLOGY FOR CREATING VOICE, THE QUALITY OF THE VOICE CREATED HAS BEEN SIGNIFICANTLY IMPROVED. WITH THAT OBVIOUSLY IS MUCH MORE ATTRACTIVE TO SOMEONE WHO IS AT RISK OF LOSING THEIR ABILITY TO SPEAK. I THINK THAT SPEAKS TO WHY IN THE PAST COUPLE OF YEARS THERE IS SO MUCH MORE INTEREST AND AWARENESS OF THE ABILITY TO CREATE A CUSTOM SYNTHETIC VOICE. IT'S SO MUCH MORE ATTRACTIVE BECAUSE OF THE QUALITY. THAT'S DIRECTLY RELATED TO THE SUBSTANTIAL RAPID CHANGE IN THE TECHNOLOGY.
>> REBECCA.
>> YES FOR US IT HAS CAUSED A
COMPREHENSIVE REVIEW OF ALL OF
OUR CONTRACTS.
AT THE END OF THE DAY BEING ABLE
TO NEGOTIATE AND ENFORCE THE
CONTRACTS DIRECTLY IS AT THE FOR
FRONT OF WHAT WE DO.
IT CERTAINLY HAS EXPANDED OUR
LEGISLATIVE EFFORTS AROUND THE
COUNTRY, FOR SURE.
I THINK IT'S DONE A THIRD THING,
FOR US TO BE LOOKING AT AND
WORKING WITH PEOPLE THAT ARE
ETHICAL PARTNERS IN IN THIS SPACE.
MAKING SURE PEOPLE USING THIS
TECHNOLOGY AND UNDERSTANDING
FARE COMPENSATION ARE ABLE TO
WORK WITH OUR PERFORMERS.
>> WHEN YOU SAY LEGISLATIVE
EFFORTS YOU ARE TALKING ABOUT
THE STATE RIGHT TO PUBLICITY
LAWS YOU REFERENCED EARLIER
DEALING SPECIFICALLY WITH AN
ACTOR'S RIGHT TO THEIR OWN
VOICE.
NOT NECESSARILY --
>> IMAGE AND VOICE RIGHTS WITH
REGARD TO THEIR VOICE.
WE TALKED EARLIER ABOUT STATES,
YOU KNOW GREAT STATES LIKE, YOU
KNOW CALIFORNIA AND TENNESSEE
THAT HAVE DIFFERENT PROVISIONS
ALREADY.
THIS ARE A LOT OF STATES.
I'M A NEW YORKER.
NOT A GREAT RIGHT OF PUBLICITY
IN LAW, THEY DON'T HAVE A POST
MORTEM RIGHT THINGS LIKE.
THAT WE HAVE GOVERNMENT AFFAIRS
AND PUBLIC POLICY DEPARTMENT
THAT SPECIALIZES WITH ANALYZING
THOSE LAWS FOR STATE
LEGISLATURES FOR OUR MEMBERS AND
THE PUBLIC.
>> AT THIS POINT SAG HASN'T BEEN
WORKING ON LEGISLATION SPECIFICALLY FOR VOICE CLONING. TO BE CLEAR.
>> NO, SO IN THE RIGHT OF PUBLICITY IT IS A BROADER BASED RIGHT OF PUBLICITY. WE'RE NOT LOOKING AT IN TERMS OF ONE ASPECT OF IT.
>> IN TERMS OF HOW I THINK THE TECHNOLOGY HAS CHANGED. CERTAINLY BEFORE WE HAVE HAD SO MANY CHANGES IN THE TECHNOLOGY WE'RE OFFERING AND BUILDING. I THINK IT'S CHANGED THE MARKETS WE CAN SERVE. INITIALLY PEOPLE WITH DISABILITY WE CONTINUE TO SERVE THAT POPULATION. IT'S A SMALL FRAGMENT OF THE POPULATION. YOU CAN'T NECESSARILY BUILD A BUSINESS AROUND THAT. NOW THE VOYAGESES SOUND BETTER THERE ARE OTHER INDUSTRIES YOU CAN HAVE AS A RESULT OF THAT. IT'S ALSO BECAUSE THE MELODY IS MORE APPROPRIATE AND MORE HUMAN LIKE THAT IT ACTUALLY BECOMES MORE REALISTIC SOUNDMING FOR THE APPLICATIONS. THE OTHER THING IS TOO WE ENDED UP HAVING SOME WORK THAT WE DID WITH A FINANCIAL INSTITUTION. WE WERE ASKED TO BUILD THESE VOICES AND SEE IF WE COULD BREAK THROUGH THE AUTHENTICATION SYSTEM. THAT IS WHERE WE STARTED TO THINK MORE ABOUT HOW TO SAFEGUARD THIS. AS WE SAW THE MARCH OF THE TECHNOLOGY MOVING FORWARD WE REALIZED WE CREATED THIS THING THAT INITIALLY WAS BENEVOLENT AND HAD A MISSION DRIVEN ASPECT TO IT WE NEEDED TO ALSO BE
THINKING ABOUT THE PROTECTION PART OF IT AS WE EVOLVE IN THIS WE HAVE KIND OF GONE FROM OKAY IT SOUNDS LIKE THIS PERSON. HOW DO WE SCALE IT. HOW DO WE MAKE THE COSTS MORE ACCESSIBLE. THEN IT WENT FROM THAT TO IT'S NOW SOUNDING BETTER AND WE HAVE DIFFERENT TECHNOLOGIES TO NOW WE HAVE TO PROTECT IT. IT'S ACROSS. >> I WOULD SAY THE ANCILLARY CRIMINAL TOOLS THAT WOULD AMPLIFY, NO PUN INTENDED, THE VOICE TECHNOLOGY HAVE EXPONENTIALLY IMPROVED THE LAST TWO TO FIVE YEARS. FIVE YEARS AGO WHEN I GOT A CASE I COULD PRETTY MUCH CUT FIVE SUBPOENAS AND CATCH THE GUY IN THREE MONTHS, SIX MONTHS. NOW WITH AMNON HICHING

TECHNIQUES -- THE ANCILLARY TOOLS HAVE GOTTEN VERY CHEAP, VERY READILY AVAILABLE AND VERY GOOD. THE CRIMINALS ARE LOVING IT. SO IT'S THAT IN TANDEM WITH THE VOICE ISSUES THAT ARE A LAWENCE FORCIMENT CHALLENGE. >> WE TALKING ABOUT TECHNOLOIY WITH A SLIGHT DELAY WHAT HAD THE PERSON USING THE TECHNOLOGY WANTS TO SAY AND THE TECHNOLOGY'S OUTPUT. ARE WE SEEING THIS TECHNOLOGY BEING USED IN REALTIME? URGES YES. THERE ARE METHODS THIS IS REAL TIME USE. SYNTHETIC USE HAS BEEN USED REAL TIME FOR A LONG TIME. IT JUST DOESN'T SOUND VERY HUMAN LIKE.
>> I THINK THE QUESTION BETWEEN EX TESTIMONY POOR AIRIOUS SPEECH AND PREPARED SPEECH IS IMPORTANT THERE. THE SUNG WILL MESSAGE CAN BE REAL TIME. IF SOMEONE IS FORTUNATE TO HAVE COME UP WITH ALL OF THE RIGHT SCRIPT ITEMS FOR A CONVERSATION AND PRESTORED THOSE, POTENTIALLY A CONVERSATION COULD SEEM TO BE REAL TIME.

>> AS THE REAL TIME TECHNOLOGY GO GETS BETTER I WOULD EXPECT ANY CRIMINAL USING THE TECHNOLOGY WOULD BE LIKELY SUCCESSFUL IMPLICATED WHAT MONA WAS DISCUSSING.

>> I REALLY DO WANT TO SAY I'M SELF CONSCIENCE ABOUT BEING THE VOICE OF DOOM. I THINK THE TECHNOLOGY GO IS FANTASTIC. I DON'T WANT THE TAKEAWAY TO BE WE SHOULDN'T DO THIS. I JUST WANT TO EDUCATE CONSUMERS, ASKING QUESTIONS BACK ABOUT SECRET INFORMATION THAT PERHAPS ONLY THE SPEAKER WOULD KNOW, A TRUSTED PERSON, DOING FRONT END TECHNOLOGY, I DON'T KNOW IF THEY CAN WATER MARK THE AUDIO SO THAT IT'S READILY, THE TECHNOLOGY IS READILY AVAILABLE TO CONSUMERS TO DO A LITMUS TEST ON A REAL VOICE OR NOT. I DON'T WANT THE TAKE AWAY TO BE THIS IS BAD WE SHOULDN'T DO IT. IT'S MORE LIKE, WE NEED TO THINK UP FRONT ABOUT PROTECTING CONSUMERS WHO WILL DEFINITELY BE VICTIMIZED IN WAYS BY CRIMINALS. IN MY DARK WORLD EXPERIENCE THE CRIMINALS ARE USUALLY AHEAD OF US IN TERMS OF LAW ENFORCEMENT. I THINK EDUCATING CONSUMERS IS
MORE IMPORTANT.
I'M NOT SURE THE TECHNICAL FIX
WILL BE READILY AVAILABLE OR UP
TO DATE ENOUGH FOR THE AVERAGE
CONSUMER TO USE AND DETECT
WHETHER IT'S AUTHENTIC OR DEEP
FAKE AUDIO.
WHAT THAT CONSUMER EDUCATION
PLATFORM LOOKS LIKING.
I GUESS THAT'S PARTLY WHY WE'RE
HERE TODAY.
THINKING ABOUT EDUCATING
CONSUMERS.
YOU'RE PROBABLY IN THE BEST
POSITION TO TELL US WHAT TO LOOK
FOR TO DETECT A DEEP FAKE.
>> YES.
>> I THINK YOU TOUCHED ON THAT
IN THE OPENING REMARKS.
YOU TALKED ABOUT AWARENESS BEING
ONE OF THE MOST IMPORTANT
THINGS.
WHAT ARE COMPANIES DOING?
OR ARE COMPANIES NOT THE PROPER
MECHANISM OF MAKING PEOPLE AWARE
OF THE TECHNOLOGY THAT EXISTS?
>> I THINK COMPANIES ARE
STARTING TO DO THAT.
RECENTLY THERE WAS A PRODUCTION
PUT ON BY THE MIT, IT'S A LONG
NAME LIKE CITIZEN AWARENESS OR
SOMETHING LIKE THAT.
THE PEACE WAS CALLED "IN THE
EVENT OF MOON LANDING."
IT WAS TAKING NIXON'S SPEECH
THAT HAD THEY NOT LANDED ON THE
MOON WHAT A DISASTER IT WOULD
HAVE BEEN.
RECREATED NICK ON DOING THAT
WITH VIDEO AND AUDIO.
IT WAS PLAYED AT A FILM FESTIVAL
IN THE NETHERLANDS TPHURBLLY.
THERE WILL BE FOOTAGE RELATED TO
THAT AFTERWARDS.
PART OF THE GOAL OF THE PROJECT
WAS TO EDUCATE PEOPLE ABOUT WHAT
IS AVAILABLE WITH THE TECHNOLOGY THESE DAYS.
AS THEY SHOW THE VIDEO THERE ARE MARKINGS ON THE SIDE AND ANNOTATIONS.
THAT'S FAKE.
THE LIPS MOVED IN THIS WAY.
THE LOWER LIP IS SLOWER THAN THE UPPER LIP.
THINGS LIKE THAT TO EDUCATE PEOPLE WHAT TO LOOK FOR.
IF YOU BRING PEOPLE UP TO SPEED ON SIMPLE THINGS.
YOU KNOW YOUR UPPER LIP IS ATTACHED TO THE PART OF THE FACE THAT DOESN'T MOVE.
YOUR LOWER LIP MOVES.
LOCK FOR THAT, RIGHT.
IN VIDEO YOU CAN'T ALWAYS, IN ANIMATED VIDEOS SOME THINGS LIKE THAT CHANGE A LITTLE BIT.
THERE MIGHT BE WAYS.
THESE ARE WAYS TO EDUCATE THE PUBLIC.
IT WAS DONE THROUGH ART.
IT WAS DONE IN A WAY NOT TO SCARE PEOPLE BUT TO EXPLAIN TO THEM WHAT THE TECHNOLOGY CAN DO.
WE'RE WORKING WITH AN ARTIST NOW, AN OPERA SINGER.
WE'RE MAKING A SHOW WHERE THERE WILL BE A COMBINATION OF AUDIO AND HER SYNTHETIC, HER SINGING AND HER SYNTHETIC VOICE, NOT SINGING.
WE CAN'T DO THAT YET.
PRODUCING SOUND.
THIS COMBINATION WILL BE ANOTHER WAY TO BRING PEOPLE UP TO THINKING ABOUT THE POSSIBILITIES AND WELL AS NEGATIVE CONSEQUENCES.
>> REBECCA FROM YOUR PERSPECTIVE FOR ACTORS NOT PART OF THE UNION.
ARE ANY EFFORTS BEING MADE TO
MAKE THEM AWARE OF THE ISSUES AS WELL.
>> SO SAG-AFTRA TAKES THE VIEW THAT THOSE WHO ARE NOT MEMBERS YET ARE MEMBERS THAT HAVEN'T JOINED YET.
WE DO THAT BECAUSE WE REALIZE ALL PEOPLE KNOWN IN THE INDUSTRY START OUT NOT BEING A MEMBER.
WHEN THEY RISE TO A CERTAIN LEVEL OF PROFESSIONALISM BECOME PART OF OUR UNION AND WE'RE THANKFUL TO HAVE THEM.
WHEN WE THINK ABOUT THIS SPACE WE THINK ABOUT EDUCATING ALL PERFORMERS, ALL PEOPLE IN THE EARLY STAGES.
WE DO EXTENSIVE OUTREACH TO COLLEGES, UNIVERSITIES, BROADCAST PROGRAMS TO MAKE SURE THOSE PEOPLE UNDERSTAND THIS.
IT'S IMPORTANT TO US IN A LARGER SCHEME FROM THE ARTISTIC AND THE NEWS COMMUNITIES.
SO WE ARE VERY MUCH THINKING ABOUT IT AS PART OF OUR HOLISTIC APPROACH TO EDUCATING EVERYBODY:
>> YOU MENTIONED, REBECCA, EARLIER YOU WERE VERY HAPPY THAT THIS WORKSHOP WAS TAKING PLACE.
YOU HAVE BEEN AT THE TABLE WITH A LOT OF DISCUSSIONS HAPPENING.
ARE YOU HAVING THE DISCUSSIONS WITH COMPANIES OR THE DISCUSSIONS WITH PROFESSORS, INTELLECT YOU'LLS?
WHO IS AT THE TABLE NOW DISCUSSING THESE ISSUES YOU'RE PART OF?
>> WE'RE HAVING DISCUSSION BOTH WITH COMPANIES, WITH PROFESSORS, I THINK THIS IS PART OF A LARGER QUESTION IN TERMS OF THE FUTURE OF WORK IN GENERAL.
YOU KNOW WE HAVE ALWAYS TAKEN AN APPROACH IN SAG-AFTRA IN TERMS
OF EMBRACING INNOVATION AND HELPING OUR MEMBERS ADAPT TO IT. OUR PRESIDENT IS THE SECTOR CHAIR THROUGH THE AFLCIO. PART OF WHAT WE HAVE DONE IN THE U.S. AND FIA THE ORGANIZATION FOR ACTORS AROUND THE WORLD IS WORKING AND HAVING CONVERSATIONS IN ALL OF THOSE PLACES THAT WANT TO HAVE IT. WE HAVE DONE CONVERSATIONS WITH FOLKS ACROSS. NOT JUST TO HAVE A UNDERSTANDING WHAT IS THERE NOW AND BEING USED BUT HOW IT WILL ADAPT. IT COMES DOWN TO ARE ALL THE COMPANIES MOVING INTO THE SPACE THINKING ABOUT IT FROM A ETHICAL POINT OF VIEW. THERE ARE A LOT OF GREAT INDUSTRY PLAYERS THAT ARE. THEY VIEW IT FROM THE POINT OF VIEW OF PEOPLES VOICES BEING UNIQUE AND THEY BELONG TO THEM. THEY WANT TO DO THIS IN A WAY THAT MAKES SENSE. THERE ARE OTHER, MAYBE SOME OF THE TECH COMPANIES THAT DON'T EVEN ACKNOWLEDGE THAT PIECE IN THE PUZZLE THAT VOICES ARE SOMETHING THAT IS UNIQUELY YOURS. THAT IS PART OF THE CONVERSATION WE HAVE BEEN ENGAGED WITH. >> ASIDE FROM THE POSITIVE USE CASES WE SRAO DISCUSSED TODAY ARE THERE OTHER POSITIVE USES OF THE TECHNOLOGY DISCUSSED IN THE MEETINGS. >> YES, I MEAN OBVIOUSLY AS WE GO TO THE VOICE-FIRST UNIVERSE. THAT'S HOW WE INTERACT WITH THE PHONES. WE'RE USE TO TAPPING ON THE SCREEN AND FINDING WHAT WE WANT TO DO.
THERE ARE MULTIPLE USES, AS LEAST FOR OUR MEMBERS AND THE PUBLIC AT LARGE USING THAT SOMEWHERE I THINK IT'S INCREDIBLE.
IT PROVIDES A HUGE SPACE WHERE I THINK WE CAN ALL AGREE THERE ARE HUGE IMPROVEMENTS NOT INTERACTING PHYSICALLY WITH YOUR PHONE.
WE SEE THE BASICS OF THE TECHNOLOGY ALREADY.
IMAGINE IT BEING DONE IN A WAY SO MUCH MORE ROBUST.
IT'S EXCITING AND I KNOW OUR MEMBERS ARE EXCITED ABOUT THAT PIECE OF IT.
>> I THINK THERE ARE APPLICATIONS IN HEALTHCARE, FOR EXAMPLE.
NOT NECESSARILY PEOPLE WITH DISABILITIES.
IF YOU THINK ABOUT PHYSICIANS.
THINK ABOUT PHARMACISTS AND SOCIAL WORKERS.
WAYS THEY CAN ACTUALLY TOUCH MORE LIVES AND ACTUALLY HAVE BETTER CARE.
IT MIGHT BE THROUGH A VOICE AVATAR OR VOICE CLONE, WHATEVER YOU WANT TO CALL IT THESE ARE NOT VOICE ACTORS.
THEY'RE PROFESSIONALS.
THE VOICE IS IMPORTANT IT'S TRUSTED WITH THEIR INTERACTION WITH THEIR PATIENTS.
THINKING ABOUT THE WAYS YOU EXERCISE, PHYSICAL THERAPY, IT MIGHT BE ASSOCIATED WITH AN APP AS WELL.
THE COACH IS YOUR PT, RIGHT.
THERE ARE VARIOUS THINGS YOU CAN THINK ABOUT HOW THE TECHNOLOGY CAN BE USED IN ORDER TO CONTINUE THE RELATIONSHIP THAT YOU HAVE WITH A KNOWN INDIVIDUAL AS WELL.
I think also just thinking about, you know technologies that we're all relying on in our home, home automation technologies. We use our voice to control that. A high quality effective voice for a person who is unable to speak or whose speech is not clear, it's really essential in terms of giving that level of independence that otherwise is not available to them.

Okay. If there was one thing that you want the public know and we haven't talked about on the panel, what would it be? I'm a big goose egg on this one. I -- I really have to pass.

So I will jump in then. I started my brief discussion about by highlighting our voice is truly how we connect with the world around us. It represents us. It best allows us to develop social relations and really reflect ourselves. So this technology is allowing people either who are at-risk or have lost their ability to speak to maintain that social connectedness. That thread that allows us all to relate together as human beings.

Also with the work that Rupal is doing for people who have never been able to speak. It gives them an authentic connection to the people and world around them.
THAT ESSENTIAL IMPORTANT PIECE.
AS MONA INDICATED WHAT IS
IMPORTANT IS THAT WE RECOGNIZE
THAT AND THEN FIGURE OUT HOW TO
MANAGE THIS SO IT'S SAFE.
ABSOLUTELY RECOGNIZE THE, THE
CRITICAL NATURE OF PERSONAL
VOICE.
>> I THINK I WOULD SAY THAT, YOU
KNOW, VOICES ARE VALUABLE TO
THE PEOPLE THAT DON'T HAVE THEM
AND NEED THEM.
TO PEOPLE WHOSE LIVES AND
CAREERS ARE MADE BY THEM, BUT
ALSO BY US WHO ARE THE
BENEFICIARIES OF HEARING THOSE
THINGS KNOW THEM, TRUST THEM,
AND UNDERSTAND THAT THOSE ARE
SOURCES OF GREAT POWER AND
INFLUENCE.
SO WHEN I'M THINKING ABOUT A
TAKE AWAY FOR ME IT'S FINDING
THE BALANCE BETWEEN WHAT IS
UNDoubtedly TECHNOLOGY EXCITING
AND NOT MAKING SURE WE DON'T END
UP IN A BAD EPISODE OF BATTLE
STAR GALACTICA.
>> ANYTHING ELSE FROM OUR --
>> I THINK WE HAVE COVERED
EVERYTHING.
>> OKAY.
THANK YOU EVERYBODY FOR TAKING
THE TIME TO SPEAK WITH US ON THE
FIRST PANEL.
I THINK IT WAS VERY INFORMATIVE
AND VERY ENGAGING.
THANK YOU.
[ APPLAUSE ]
>> THANK YOU.
>> THANK YOU FOR THE
OPPORTUNITY.
THANK YOU.
>> GOOD AFTERNOON, WELCOME BACK.
I'M DAN SALSBURG FROM THE FTC.
BEFORE THE BREAK WE HEARD HOW
VOICE CLONING TECHNOLOGY WHO
HAVE LOST THEIR ABILITY TO
SPEECH TO SOUND LIKE FORMER
SELVES.
WE ALSO LEARNED THAT THIS
TECHNOLOGY CAN HAVE SERIOUS DARK
SIDE THAT ENABLES CRIMINALS TO
ENGAGE IN SCHEMES OF SCALE,
EXTORTION, OTHER CRIMES.
SO HOW DO WE BALANCE THE
POTENTIAL UPSIDES TO HARMs OF
NEW ARTIFICIAL INTELLIGENCE
TECHNOLOGY?
WHO SHOULD BE DOING THIS
BALANCING?
THESE ARE AMONG THE QUESTIONS
THAT WE’LL BE EXPLORING THE NEXT
HOUR WITH FANTASTIC GROUP OF
PANELISTS, FULL BEOS ARE
INCLUDED I’LL JUST BRIEFLY
INTRODUCE THEM NOW.
ON MY IMMEDIATE LEFT IS ROSALYN
BERNE A COMPUTER SCIENCE
PROFESSOR AT UNIVERSITY OF
VIRGINIA.
ALTHOUGH SHE’S NOT SPEAKING ON
BEHALF NATIONAL ACADEMY OF
ENGINEERING.
ON HER LEFT IS LEIGH HAFREY.
LECTURER AND BEHAVIORAL AND
POLICY SCIENCE ON SLOAN SCHOOL
OF MANAGEMENT AUTHOR OF NUMBER
OF BOOKS ON LEADER SHIPS AND
ETHICS INCLUDING FIVE STEPS TO
MASTERING ETHICS IN BUSINESS.
ASHISH JAiman IS DIRECTOR OF
MICROSOFT DEFENDING DEMOCRACY
PROGRAM WHERE HE’S WORKING ON
DISINFORMATION DEFENSE AND DEEP
FAKE INTERVENTION STRATEGIES.
AND FINALLY AT THE END OF THE
TABLE KIRSTEN MARTIN.
SHE IS CHAIR OF THE DEPARTMENT
OF STRATEGIC MANAGEMENT AND
PUBLIC POLICY AT GEORGE
WASHINGTON UNIVERSITY’S BUSINESS
SCHOOL AND AUTHOR SEVERAL
ARTICLES ARE ETHNICS AND
TECHNOLOGY.
IF YOU HAVE QUESTIONS FOR THE
PANEL, PLEASE WRITE THEM DOWN ON
THE QUESTION CARDS AND HAND THEM
TO FTC STAFF WHO WILL BE
CIRCULATING.
HOPEFULLY WE'LL HAVE TIME TO ASK
SOME OF THEM.
I'M GOING TO BEE GENERAL WITH
AQUAPHOR ASHISH.
YOUR PROGRAM AREA AT MICROSOFT
DEFENDING DEMOCRACY.
AT THE SAME TIME MICROSOFT
OFFERS A CUSTOM VOICE SERVICE
THAT CAN CREATE A VOICE CLONE.
CAN YOU DESCRIBE KIND OF WHAT
THE CUSTOM VOICE PROGRAM IS AND
THEN HOW YOU WENT A BOUT
CONSIDERING THE ETHICAL
IMPLICATIONS OF THIS TECHNOLOGY
AND HOW TO PREVENT ITS MISUSE.
>> WELL, THANK YOU, DAN.
I'LL START WITH MICROSOFT AS A
PLATFORM AND TOOLS COMPANY WE
HAD CUSTOM VOICE TECHNOLOGY WAY
BACK IN THE DAY ESSENTIALLY.
THE WINDOWS, WE DID HAVE THE
NARRATOR WHICH WAS MORE LIKE
MECHANICAL ROBOTIC VOICE.
BUT RECENTLY SINCE LAST MANY
YEARS WE HAVE, AS WE HEARD IN
THE EARLIER PANEL WE HAVE
FINESSED HOW REAL THESE VOICES
HAVE BECOME.
SYNTHETIC VOICES HOW REAL THEY
ARE.
LATELY FROM OUR TEXT TO SPEECH
SERVICE, WE HAVE BEEN THINKING
ABOUT HOW DO WE ACTUALLY CREATE
SOMETHING, BECAUSE AGAIN WE
LEARNED ABOUT A LOT OF GOOD USE
CASES AND THERE ARE, I'LL SAY,
95% OF THESE SYNTHETIC VOICE
DEFECTS ARE USED -- THEY ARE
POSITIVE USE CASES.
5% OF FAILURE, BUT AS WE STARTED THINKING ABOUT WE THINK IN TWO TERMS.
WHAT ARE THE POTENTIAL BENEFIT OF ANY TECHNOLOGY THAT WE BRING TO MARKET.
AND THEN BALANCE IT OUT WITH RISK -- I'LL SAY RISK MODEL OF POTENTIAL HARM OF THAT TECHNOLOGY CAN BRING.
BUT SOME MECHANISM TO REDUCE RISK OF THE HARM.
SO, BENEFITS ON ONE END, WHICH WE THINK THERE ARE HUGE NUMBER OF THEM.
RISKS, ESSENTIALLY CREATE A THREAT MODEL OR RISK THEN GOVERNANCE MODEL WHERE WE SAY, OKAY, WHAT CAN WE DO TO BRING THE RISK DOWN.
WE LAUNCHED AS A SERVICE.
WHERE DOES THIS SERVICE LIVE?
IT LIVES IN AN ORGANIZATION IN MICROSOFT CALLED COGNITIVE SERVICES.
THERE'S A GROUP CALLED ETHICS AND AI AND THAT'S ACTUALLY THE GOVERNANCE TEAM OR ANY OF THOSE COGNITIVE SERVICES.
SOME OF OUR FACE RECOGNITION TECHNOLOGY ALSO SITS THERE, VOICE TECHNOLOGY, KNOWLEDGE TECHNOLOGY.
ESSENTIALLY MOSTLY AI TECHNOLOGIES THAT CAN ENABLE SO MANY SCENARIOS SIT WITH GOVERNANCE MODEL WHICH WE CALL ETHICS AND AI TEAM IN MICROSOFT.
WHEN WE LAUNCHED CUSTOM VOICE, THAT WAS A TEAM THAT CAME UP WITH WHAT WE CALL INTERNALLY A HARMs FRAMEWORK, SAYING, HEY, THESE ARE THE POTENTIAL MISUSES OF THIS TECHNOLOGY.
GOVERNANCE MODEL IF THESE POTENTIAL MISUSERS IF WE SEE ANY
OF THESE USED WE CAN CUT ACCESS TO THE SERVICE.
AND THAT'S HOW WE STARTED LOOKING AT THIS.
WE CREATED AN ENFORCEMENT MECHANISM HOW DO WE CUT ACCESS TO THIS.
COME UP WITH IF IT IS USED FOR X, Y PURPOSES YOU CAN THINK OF AS A CHECKLIST, AUTO SYSTEM SHELLY.
WHICH A CUSTOMER CAN USE TECHNOLOGY FOR ALL GOOD CASES BUT IF THEY FALL IN ANY OF THOSE HARMS FRAMEWORK CHECKLIST THEN WE'LL CUT ACCESS.
AND THAT'S HOW WE ARE THINKING ABOUT IT AS NOT ONLY THE BALANCING OF POTENTIAL GOOD USE CASES, BUT MANAGING IT WITH WHAT KIND OF RISK FRAMEWORK THEN HAVE A GOVERNANCE MODEL AROUND IT.
>> JUST SO I UNDERSTAND LET'S SAY I WANTED TO TAKE ROSALYN'S VOICE AND UPLOAD IT TO MICROSOFT.
WOULD I BE ABLE TO CREATE A VOICE CLONE OF HER VOICE?
>> SO ESSENTIALLY ONE THING THE GOVERNANCE MODEL REQUIRES A FRAMEWORK THAT WE CREATED, NOT ONLY -- YOU CAN, IF YOU CAN SHOW US THAT YOU ACTUALLY WOULD BE USING THAT CUSTOM VOICE WITH CONSENT OF ROSALYN IN THE RIGHT WAY.
WITHIN THOSE PER VIEW OF THE BENEFIT AND HARMS FRAMEWORK.
>> YOU HAVE METHOD FOR DETERMINING THAT, I'M NOT REALLY ROSALYN WHEN I SUBMIT THE VOICE?
>> SO AGAIN, YOU ARE A CUSTOMER OF MICROSOFT, YOU ARE IN THE BUSINESS OF CREATING SYNTHETIC VOICE FOR WHATEVER REASONS, IT COULD BE I WANT TO CREATE A BOT
SERVICE OR CREATING FOR ART AND
EXPRESSION OR INDIVIDUAL, GOOD
USE CASES SO YOU'RE A CUSTOMER.
AND ROSALYN IN THIS CASE IS THE
VOICE ACTOR THAT YOU WILL
ACTUALLY USE THAT SERVICE FOR.
YOU'LL UPLOAD IT SO YOU SIGN UP
LIKE WHAT WE CALL TERMS OF
SERVICE, A FRAMEWORK TERMS OF
SERVICE, UPLOAD THIS WITH THE
CONSENT FRAMEWORK F. WE SEE THAT
VOICE THAT WE GAVE YOU IS USED
FOR ANY NEFARIOUS PURPOSES WE'LL
CUT ACCESS TO IT.
>> DOES HA MAKE YOU SATISFIED?
>> NO.
HERE'S WHY.
I'M GOING TO TELL TWO QUICK
STORIES.
I'M A CUSTOMER OF SPRINT AND
LAST WEEK I WAS HAVING A TEXT
EXCHANGE WITH SOMEONE I REFER TO
AS MY WASBAND, WE WERE TALKING
ABOUT FINANCIAL MATTERS, SORT OF
PERSONAL.
AFTER FOUR DAYS, WHAT IS WRONG,
HE'S NOT RESPONDING, THIS IS
IMPORTANT.
A TEXT CAME IN THAT SAID, WHO
ARE YOU WRITING TO?
I DON'T THINK I'M THIS PERSON.
I THOUGHT, WHOA, WHO IS THIS?
WELL IT TURNS OUT WHO'S THIS WAS
JUST A THIRD PARTY THAT HAD
ACCESS TO OUR TEXTS.
SO AS SPRINT CUSTOMER I GOT ON
THE PHONE I SAID, HELLO, I'M
SCARED!
WHAT'S GOING ON, GET THIS PERSON
OFF MY PHONE.
THREE DAYS LATER THEY HAD NOT
BEEN ABLE TO RESOLVE THE
PROBLEM.
FINALLY, FINALLY I REALIZED
BECAUSE THE PERSON WAS NOT
INTENDING ANY HARM THEY JUST
HAPPENED TO BE SEEING ALL MY TEXT MESSAGES BUT MY WAS -- WUSBAND TURNS OUT THAT PERSON'S NUMBER, ENDED UP IN CONTACTS, NOBODY KNOWS HOW. THE STORY IS TOLD, BECAUSE SPRINT INTENDED TO PROTECT ME. I NEEDED PROTECTION, NOBODY COULD FIGURE OUT HOW TO DO IT. SO WHEN WE TALK ABOUT ETHICS WE'RE LOOKING AT MINIMIZING HARM, MAXIMIZING GOOD, GENERALLY SPEAKING. I'M NOT CONVINCED THAT WE HAVE BEEN ABLE TO DESIGN INTO THE SYSTEMS THEMSELVES THE CAPACITY TO PROTECT THE INDIVIDUAL. I THINK MICROSOFT IS A GREAT COMPANY, DON'T GET ME WRONG. BUT SOMETIMES I DON'T THINK WE HAVE THE CONTROL WE BELIEVE WE MIGHT. OR THAT WE MIGHT WANT. >> DO YOU THINK PART OF THE ISSUE IS THAT IT'S HARD TO KNOW WHAT THE HARMS ARE, SOMETIMES THEY'RE UNANTICIPATED. MAYBE THE HARM THAT -- THINKING OF SECURITY OF THEIR TEXTING SYSTEM THIS NEVER CROSSED THEIR MIND THAT THIS WOULD HAPPEN. >> WE ARE EYE INVOLVING, TECHNOLOGY EVOLVES AS WELL AS THE BAD ACTORS THINKING IS INVOLVING. I WOULD SAY EVEN THOUGH YOU CAN CREATE THE CHECKLIST THAT WE HAVE TODAY, BUT IT HAS TO KEEP PACE WITH THE WAY WE SEE OTHER THREATS COMING IN. I THINK I CAN GO BACK TO WHAT THEY WERE SAYING, THERE WILL BE THING THAT WE DON'T ANTICIPATE RIGHT NOW IN TERMS OF HARMS CUSTOM VOICE CAN CREATE WE HAVE TO MAKE SURE THAT WE ARE KEEPING
PACE WITH SOCIETY, WITH TECHNOLOGIES AND KEEP ON EVOLVING OUR FRAMEWORKS OF GOVERNANCE AS WELL AS HARMS THAT WE HAVE.

>> CAN I JUST --
SURE.

>> I'M CURIOUS YOU MENTIONED ASHISH THE PROGRAM IS CALLED DEFENDING DEMOCRACY? YOU HAVE MADE A POLITICAL CHOICE AS A FRAMEWORK FOR YOUR TECHNOLOGY, YOUR INVESTIGATIONS. WHY DEMOCRACY?

>> AGAIN, I AM PART OF DEFENDING DEMOCRACY WE THINK DEFECTS ARE ONE OF THE EMERGING THREATS TO DEMOCRACY BUT TALKING ABOUT VOICE CLONING WHICH FOR MICROSOFT AS I SAID THE CREATION OF IT SERVES UNDER COGNITION SERVICES, GOFF THAN TEAMS CALLED ETHICS AND AI I'M JUST REPRESENTING TALKING ABOUT THAT PIECE.

NOW FROM THAT PERSPECTIVE FROM DEFENDING DEMOCRACY PERSPECTIVE, WE HAVE BEEN LOOKING INTO THIS ISSUE AREA AS I SAID, WE THINK THIS WHOLE IDEA OF DEFECT BOTH FROM PERSPECTIVE OF VOICE OR AUDIO OR AUDIO VOICE AS WELL AS VIDEO, ONE OF THE GOOD USE CASES FOR DISRUPTION ACTUALLY IS DEMOCRACY, WHERE YOU CAN HAVE SOCIETAL DISCORDS AND ALL KINDS OF ARMS THAT CAN BE CREATED BY DISRUPTING, USING DEFECTS AS BIGGEST TECHNIQUE FOR THIS INFORMATION.

>> SO YOU HAVE THIS ETHICS AND AI GROUP. ARE THEY INDEPENDENT FROM THE DEVELOPERS OF THE PROGRAM SO THAT THEY CAN ASSESS THE HARMS AND --
YOU CAN THINK OF THEM AS GOVERNANCE BODY.
WE HAVE THIS RESPONSIBLE AI, IF YOU LOOK INTO THE ORGANIZATION STRUCTURE OF MICROSOFT, OUR LEGAL HEAD IS PRESIDENT BRAD SMITH.
SO ALL THESE RESPONSIBLE AI ORGANIZATION AND OUR ORGANIZATION SITS UNDER BRAD VERSUS ENGINEERING LEADERS, WE HAVE AI ENGINEERING, WE HAVE CLOUD ENGINEERING LEADER AND THEY SIT -- THEY ALL BUT WE ACTUALLY, YOU CAN THINK OF AS A GOVERNANCE BODY IN OUR ORGANIZATION NOT IN ENGINEERING ORGANIZATIONS.

LET'S SAY THE ETHICS AND AI GROUP IS DOING THIS INDEPENDENT REVIEW OF POTENTIAL PROGRAM, WHEN DOES THAT OCCUR?
IS IT WHEN THERE'S A GLIMMER OF HOPE ABOUT A PROGRAM OR DURING --

WE HAVE LEARNED FROM -- BACK IN THE DAY, IT WAS I THINK BACK IN EARLY 2000S IN FACT WHEN WE ANNOUNCED THIS PROGRAM CALLED TRUSTWORTHY COMPUTING.
SECURITY IS NOT AN ADD ON, IT HAS TO START AS YOU START ENVISIONING A SOLUTION.
WE ARE TAKING SIMILAR KIND OF 'MILOSEVIC ON RESPONSIBLE AI WHERE WE DON'T THINK THAT RESPONSIBLE AI ACTUALLY IS ONCE THE PRODUCT IS DONE WE HAVE CHECKLIST WE GO THROUGH IT.
WE WANT TO MAKE SURE THAT IT IS PART OF THE CULTURE AS WE START ENVISIONING A SOLUTION,
ESPECIALLY AROUND AI THINK ABOUT WHAT THE POTENTIAL IMPLICATIONS,
WHAT OUR CHOICES WE MAKE AT DEIS IN WOULD BE.
KIRSTEN, DOES THAT TIMING MAKE SENSE THAT YOU START THINKING ABOUT ETHICS FROM DAY ONE OR EARLIER?

I THINK TWO THINGS ABOUT WHAT YOU SAID THAT MAKES SENSE. ONE IS THE IDEA THAT THESE VALUE-LADEN DECISIONS ARE MADE IN DESIGN. THEY'RE ACTUALLY BEING MADE, ONE THEORY THEY'RE ACTUALLY BEING MADE WHETHER YOU TALK ABOUT THEM OR NOT. SO YOU CAN DO THEM WELL OR HAVE THEM BE COMPLETELY UNGOVERNED SO THE IDEA IS THAT A COMPUTER SCIENTIST, SOMEONE WHO IS DEVELOPING AI OR ANY OTHER TYPE OF COMPUTER PROGRAM, IS MAKING DECISIONS ABOUT WHAT'S EFFECTIVE, HOW IT WILL WORK, WHAT'S THE RIGHT FACTORS, WHAT SHOULD WE BE INCLUDED IN THIS, WHO SHOULD I BE CONSIDERING. AND MAKING THOSE DECISIONS IN THEIR DESIGN THROUGHOUT DESIGN AND DEVELOPMENT. THIS WAY MICROSOFT IS SAYING, LET ME HELP WITH YOU THAT AND LIEUTENANTS THINK ABOUT THIS IN A MORE SYSTEMATIC WAY. THE IDEA THE COMPUTER PROGRAMS ARE DOING IT, MICROSOFT IS ACTUALLY SAYING I'D LIKE TO HELP WITH YOU THAT BECAUSE WE THINK IF WE DO -- DON'T TALK ABOUT IT YOU'RE GOING TO DO IT IN UNGOVERNABLE WAY. THE FACT THAT IT'S EARLY ONLY TIME TO DO IT BECAUSE ONCE TECHNOLOGY IS OUT IN THE WILD IT'S MUCH MORE DIFFICULT TO RECONSTRUCT AND CHANGE ONCE IT'S OUT BEING USED. FOR BOTH OF THOSE REASONS, I THINK THE OTHER THING THAT WAS
INTERESTING THAT WAS MENTIONED IS THAT THERE'S THIS IDEA OF WHAT TYPE OF RELATIONSHIP DO YOU HAVE WITH THE CONSUMER OR USER AND TECHNOLOGY WHEN IT'S OUT AND WHEN YOU'VE SOLD IT. SO A LOT OF TIMES COMPANIES WILL SEND SOMETHING OUT THEN KIND OF GO LIKE THIS SAY YOU USE IT HOWEVER YOU WANT. I DON'T WANT TO BE INVOLVED. IT WAS INTERESTING WHAT I PICKED UP ON WAS THIS IS -- IT'S ACTUALLY HOUSED AT MICROSOFT AND A SUBTLE DIFFERENCE OF SAYING YOU HAVE TO COME TO ME EVERY TIME YOU WANT TO USE IT AND I DECIDE USE IT CORRECTLY OR NOT. IT'S ACTUALLY MUCH MORE TIME INTENSIVE FOR MICROSOFT TO DO IT THAT WAY. THEY ARE CONSTANTLY INVOLVED IN THE ONGOING USE, THEY CAN KEEP TRACK OF WHEN IN PRACTICE IS BEING USED IN A NOVEL WAY THAT'S NOT APPROPRIATE. WHERE AS IF THEY JUST SOLD IT THEY WOULD JUST HAVE ALMOST LIKE PRODUCT LIABILITY TYPE APPROACH THEY CAN SAY, IT WASN'T MY FAULT. THEY ARE TAKING MORE OWNERSHIP.

>> JUST ADD TO THAT, THAT IS POSSIBLE, BY THE WAY, BECAUSE OF CLOUD SERVICES. BECAUSE WE ARE THE CLOUD WINDOW, WE HOST SOME OF OUR SERVICES, WE ALSO ENABLE PARTNERS TO OUR SERVICES SO EVEN THEY HAVE CAPABILITY TO CREATE -- AS THEY START CREATING THE SERVICES AND SELL TO CUSTOMERS. THEY CAN TAKE LEARNING FROM US AS WE DO, IT IS ALL POSSIBLE BECAUSE OF THE CLOUD. BUT A CUSTOMER CAN ALSO NOW
START THINKING ABOUT RESPONSIBLE AI AND GOVERNANCE MODEL BECAUSE THEY ALSO ACTED ALSO IN THE CLOUD.

Part of the reasons, the computing power is needed for the cloud in order to engage in this sort of voice cloning is that right?

Again, we can go back to this, it's like the whole idea of -- for five years why everything is so on an exponential growth it's a perfect storm of technology with computing power, you have research and then you have compute, you can talk about the technology access and the democratization of technology and getting very quickly without putting a lot of research into buying hardware at once.

So all of that confluence actually ended up where we are -- the pace of innovation which also gives us new business models but also some advantage in terms of governance models if you want to start thinking that way.

When you AI folks are looking at the harms and benefits, is there like a list made of each? Is it like, should I go out with her, like that, pros and cons or and how is value put on each harm.

You're right.

Again, I don't know the details at this point.

What I know is that especially for custom voice, we made sure that before we even talk about releasing it, we actually go through this harms framework
THAT WAS CREATED.
I DON'T KNOW HOW VALUE IS PUT IN
ON ALL THAT I'M NOT THE RIGHT
PERSON TO ANSWER THAT.
BUT I AM THE RIGHT PERSON TO SAY
THAT WE ARE THINKING ABOUT IT
FROM THE GET GO OF HOW WE
DESIGN.
HOW WE DEVELOP AND DEPLOY
TECHNOLOGY.
>> I GUESS SOMEBODY HAS THE
AUTHORITY TO SAY WE'RE NOT GOING
TO ACTUALLY RELEASE THIS OR
WE'RE GOING TO PUT CONTROLS ON
IT.
>> IN FACT, IF YOU READ THE BLOG
FROM ALEX SHIPMAN WHO WAS
TECHNICAL FELLOW WHO OWNS THIS
CUSTOM VOICE TECHNOLOGY, HIS
BLOG WAS ALL ABOUT THAT.
HOW WE WOULD EVEN ABOUT
ANNOUNCING IT.
YES, A CONSIDERATION FROM
MICROSOFT'S POINT OF VIEW.
THERE IS ABILITY TO SAY, NO, IF
THINK HARM FRAMEWORK OR
POTENTIAL HARMS ACTUALLY
OUTWEIGH THE BENEFITS OF
TECHNOLOGY.
>> I WAS WATCHING THE FIRST
PANEL THINKING ABOUT THE VALUE
OF THE BENEFITS OF VOICE
TECHNOLOGY.
AND SEEING THE VIDEO OF PERSON
WITH ALS AND THEN HEARING THE
DOOM AND GLOOM ABOUT ALL THE
POSSIBLE MISUSES.
IS IT ACTUALLY POSSIBLE TO PUT
DOLLAR VALUES ON SOME OF THIS?
CERTAINLY LIKE THE AMOUNT OF
FRAUD YOU CAN TALLY SOMETHING
UP.
HOW DO YOU ENGAGE IN THIS SORT
OF BALANCE.
>> PRICE EMOTIONS?
>> WELL, EMOTIONS, YEAH, THAT --
THAT IS, RIGHT.
THIS IS FAMILY LOVE THAT YOU
WANT TO -- CONTINUE INTO THE
INDEFINITE FUTURE AND CAN YOU
PRICE THAT.
>> CAN YOU?
>> I'M CONFUSED ABOUT THE
QUESTION.
FOR WHAT PURPOSE WOULD YOU WANT
TO PUT A MONETARY VALUE ON ANY
OF THIS?
>> THAT IS A VERY GOOD QUESTION.
BUT I GUESS THE IDEA IS THAT IF
A BUSINESS IS COMING OUT WITH
VOICE CLONING ENGAGING ANY SORT
OF BALANCING OF HARMS AND
BENEFITS THAT'S GOING TO
DETERMINE WHETHER YOU KNOCK THEM
OUT WITH TECHNOLOGY OR PUT
CONTROLS ON TECHNOLOGY THAT
THOSE CONTROLS HAVE CERTAIN
PRICE, HOW DO YOU ENGAGE IN THAT
BALANCE?
>> MY GUESS WOULD BE, SO WHERE
IS JOHN AT THE MOMENT?
SO, MY GUESS WOULD BE THAT THE
PEOPLE WITH WHOM YOU WORK FEEL
THAT ANY PRICE IS THE
APPROPRIATE PRICE FOR THE
BENEFIT THAT YOUR TECHNOLOGIES
WOULD GIVE THEM.
WHETHER THEY COULD ACTUALLY PAY
THAT PRICE IS ANOTHER MATTER.
BUT IT IS BEYOND PRICE, IS IT
NOT?
TO HAVE THAT LOVED ONE CONTINUE
TO EXIST AT LEAST IN AUDIBLE
FORM?
>> HOLD ON ONE SECOND WE'LL GET
YOU THE MICROPHONE.
>> I'M HAPPY TO SAY THAT A
DOLLAR AMOUNT HAS NOT EVER BEEN
PART OF A DISCUSSION WITH ANY OF
THE PATIENTS OR FAMILIES.
THE EMOTION, AS YOU POINTED OUT,
IS KEY.
BUT WE HAVE NOT EVER NEEDED TO OR NOR HAS ANY PATIENT TO MY KNOWLEDGE MONETIZED WHAT THAT VALUE IS TO THEM. IT'S MORE THE EMOTIONAL CONNECTEDNESS. >> RIGHT. I THINK THAT IS A BEGINNING OF AN ANSWER. BUT YOU'RE ALSO ASKING, THIS IS TO THIS SITUATION, HOW DO YOU PRICE THE TECHNOLOGY THAT YOU PUT ON THE MARKET GIVEN THIS REALITY. THAT IS FOR SOME SEGMENT OF THE POPULATION YOU DON'T EVEN WANT TO TALK ABOUT PRICE. AND YET YOU KNOW AS YOU'RE PRODUCING THE ITEM THAT IT DOES COST. AND THAT YOU CAN LEGITIMATELY AS A BUSINESS FACTOR COST INTO YOUR CALCULATIONS FOR THE WAYS IN WHICH YOU PROVIDE THAT TECHNOLOGY, RIGHT? THE QUESTION DOESN'T GO TO JOHN BECAUSE HE'S DEALING WITH THE END USER, BUT TO YOU WHO PRODUCE THE ITEM WITH A VERY CLEAR INTENT TO MAKE A GOING CONCERN OF YOUR COMPANY. SO COST DOES MATTER. >> DAN, YOU WERE ALSO TALKING ABOUT WHAT COST WOULD YOU PUT TO THE MONETIZATION OF THE HARMS AS WELL, RIGHT? LIKE THAT WAS -- >> SURE. >> I THINK SO THAT IS -- I DON'T KNOW WHAT THE FRAMEWORK IS BUT LIKE DOING COST BENEFIT ANALYSIS IN UNDERSTANDING ETHICS, I MEAN THIS IS JUST THE QUINTESSENTIAL PROBLEM OF WHOSE HARMS COUNT, HOW DO YOU QUANTIFY THOSE HARMS AND COST BENEFIT ANALYSIS IS
ALWAYS WILLING GO TO SACK IF I CRIES MINORITY OR MAJORITY. THAT IS JUST HOW IT WORKS. YOU'RE SUMMING SOMETHING UP. SO SOMETIMES -- BUT YOU CAN ALSO DO OTHER WAYS AS LONG AS YOU'RE NOT LOOKING FOR A PURELY NUMERICAL VALUE. I WOULD SAY THIS IS NOT -- FOR EXAMPLE, I MEAN, THERE ARE CLASSIC AM COMPELS WHERE THE COST BENEFIT ANALYSIS WENT AWRY SO ORANGE O RINGS ON THE SHUTTLE, THE PINTO CASE, WE PUT NUMBER VALUE, PERHAPS SAY IT WASN'T THE CORRECT NUMBER VALUE WE DID A COST BENEFIT ANALYSIS AS CORPORATION, WE CAME OUT INCORRECTLY. THAT WASN'T IN THE LINE DID NOT SURVIVE. BUT THIS IS NOT UNIQUE TO TECHNOLOGY. YOU CAN SAY THE SAME THING ABOUT LIKE, DO YOU AMY LOU A PHARMACEUTICAL COMPANY TO CREATE PILLS WHERE WE KNOW THAT A CERTAIN PORTION OF THEM ARE GOING TO BE USED ILLICIT TEE. THAT THEY THEN ARE SHODDY ON GOVERNANCE MECHANISMS TO IDENTIFY HARMFUL USES THEY SAVE MONEY BY DOING THAT BUT CREATED SOME SORT OF SYSTEMATIC HARM. THAT'S NOT TECHNOLOGY. THAT'S JUST A PAIN PILL. WE HAVE THE SAME -- THIS -- THE IDEA OF LIKE A NEW PRODUCT HAVING HUGE BENEFITS UPSIDE COULD BE USED IN NEFARIOUS WAYS. THE SECONDARY MISUSE OF PRODUCTS IS NOT UNIQUE TO TECHNOLOGY. NOT JUST -- WE HAD THIS THIS WITH OPIOID. >> THAT'S A GREAT POINT. MAYBE TALK A BIT ABOUT -- HOW
HAVE OTHER TECHNOLOGIES WHEN THEY HAVE BEEN INTRODUCED HOW HAVE PEOPLE DEALT WITH THE ETHICS ISSUES THERE?

>> I'M THINKING EARLY ON IN THE DEVELOPMENT OF THE MECHANISMS THAT MADE POSSIBLE, KIDNEY TRANSPLANTS, VERY EARLY ON THEY ACTUALLY CALCULATED THE VALUE OF INDIVIDUAL LIVES TO DETERMINE WHO SHOULD GET THE TRANSPLANTED. THERE WAS A FORMULA TO FIGURE OUT WHO WARRANTS THIS, WHO IS A GOOD PERSON.

AND THEN THEY DETERMINED ULTIMATELY WHEN THE PRINCIPLES OF BIOETHICS CAME FORWARD THAT YOU CAN'T DO THAT. YOU GET A NUMBER YOU GET IN LINE. THAT'S THE END OF THE STORY.

WE DON'T HAVE THE CAPACITY TO DETERMINE WHO IS MORE VALUABLE THAN ANYBODY ELSE.

WITH OTHER MORE RECENT TECHNOLOGIES I'M THINKING ABOUT HOW THE MARKET DRIVERS FOR COMPETITION SEEM TO SOMETIMES PUSH THEM OUT QUICKER THAN WE HAVE THE CAPACITY TO THINK ABOUT THE ETHICAL IMPLICATIONS OF THEM.

WE'RE TRYING TO COMPETE, INNOVATE, MEANWHILE WE'RE HAVING THESE CONVERSATIONS BUT IT'S A LITTLE TOO LATE TO PUT IT INTO THE ACTUAL DESIGN.

I DON'T KNOW IF IT ANSWERS YOUR QUESTION BUT I'M TRYING TO THINK OF CASE WHERE WE'RE ACTUALLY ABLE TO METHODICALLY, CAREFULLY BUILD IN CONCERN R CONCERN FOR ETHICS BEFORE THESE THINGS GET RELEASED.

THE OTHER PROBLEM IS WE'RE TALKING ABOUT MICRO ETHICS,
MACRO ETHICS, TALKING ABOUT INDIVIDUAL HARM WITHOUT THINKING ABOUT BROADER, LARGER SCALE QUESTIONS, FOR EXAMPLE, WHAT DOES IT MEAN TO BE HUMAN. WHAT DOES VOICE HAVE TO DO WITH THAT SENSE OF IDENTITY.

>> IF WE TOOK IT TO THAT MACRO LEVEL, A LITTLE BIT IN FROM THAT MACRO LEVEL WE'D SAY, IF YOU WERE DOING SOME SORT OF COST BENEFIT ANALYSIS HERE, WHAT IS THE VALUE OF LOSING THE ABILITY TO KNOW THAT THE PERSON ON THE OTHER END OF THE PHONE IS REALLY WHO THEY SAY THEY ARE.

>> OR WHO THEY ARE OR WHAT IT MEANS TO BE THAT PERSON. A DISEMBODIED VOICE LEADS ME TO HAVE TO RECONSIDER WHO AM I AND WHO AM I TO YOU AND WHAT IS THIS OBJECT IN OUR RELATIONSHIP, WHAT DOES IT MEAN. HOW DOES IT CHANGE THAT RELATIONSHIP IN MY SENSE OF SELF. WHAT HAPPENS IF IT BREAKS, DO I DISAPPEAR WHEN IT NO LONGER FUNCTIONS?

THOSE KINDS OF QUESTIONS.

>> I THINK WE'RE VERY USED TO BALANCING PROS AND CONS HOW WE OFTEN THINK ABOUT THINGS.

WHAT IS THE ALTERNATIVE MODEL THAT A BUSINESS SHOULD BE USING WHEN IT'S THINKING HOW IT SHOULD ACT ETHICALLY?

>> I JUST WANT TO -- THIS IS A GREAT QUESTION.

AS ORGANIZATION, THIS IS SOMETHING THAT WE TAKE PRIDE IN AS WELL AS WE CAME UP AS A COMPANY, AS WE START BUILDING TECHNOLOGY, AS WE DEVELOP AS DISTRIBUTE IT, THE CORE AI PRINCIPLES THAT WILL WORK WITH,
WITHIN THE FRAMEWORK. IT INCLUDES INCLUSIVENESS, THE TECHNOLOGY THAT WE WILL BUILD HAS TO BE INCLUSIVE IT CANNOT EXCLUDE, WHATEVER POPULATION. THAT IS FAIRNESS. TRANSPARENCY, EVEN IN CUSTOM NEURAL VOICE, IN THIS CASE, RIGHT, YOUR EXAMPLE YOU HAVE TO BE TRANSPARENT THAT IT'S ROSALYN'S VOICE. THOSE KIND OF THINGS. HAVE TO BE BUILT INTO THE MODEL, ACCOUNTABILITY, PRIVACY AND SECURITY AND RELIABILITY AND SAFETY. IF YOU THINK ABOUT ANY TECHNOLOGY THAT WE BUILD IF THERE ARE CORE BRONZE THAT THEY HAVE TO ADHERE TO THE SIX PRINCIPLES OF INCLUSIVE, NEFARIOUS. RELIABILITY AND SAFETY. THEN THAT IS ALL -- IDENTIFY ANY OF THOSE BREACHES, WE HAVE THE CAPABILITY TO SAY NO. THAT IS HOW WE THINK ABOUT A BIGGER SOCIETAL VALUE THAN INDIVIDUAL HARM WHATEVER WE ARE DOING, AS A GOOD CUSTODIAN, AS A BIG TECHNOLOGY COMPANY, WHAT IS OUR PLACE. AND HOW DO WE ACTUALLY USE THAT TO CREATE HARMONY. THAT'S WHAT IT IS. >> SHOULD BE SAID, TOO, THAT THE WAY ASHISH DESCRIBES WHAT'S HAPPENING AT MICROSOFT AT LEAST FOR THIS PROJECT RESPONSE TO WHAT YOU WERE SAYING ROSALYN, THIS IS NOT LAGGING. THIS IS BUILDING. THEY ARE, YOU ARE BUILDING ETHICAL CONCERNS INTO THE PROCESS OF DEVELOPMENT FROM THE GET GO.
IT'S TRUE, I HEARD THAT. THERE'S ALSO GOVERNANCE WHICH IS SORT OF MORE THEORETICAL. BUT THAT DEEPEN GAUGE OF THE PUBLIC FROM THE BEGINNING, FROM THE EARLY DEVELOPMENT OF SOME OF THESE TECHNOLOGIES, PRACTICALLY SPEAKING I DON'T KNOW HOW THAT PLAYS OUT BUT CERTAINLY SEE IT IN THE LITERATURE.

FOR PURPOSES OF THIS PANEL WE'RE GOING TO HOLD MICROSOFT OUT AS THE MODEL IN HOW YOU'RE SUPPOSED TO DO THINGS WHEN IT COMES TO ACTING EAT I CAN -- ETHICALLY DEALING WITH AI AND VOICE CLONING AND RELATED ISSUES.

IS IT REASONABLE TO EXPECT SMALLER COMPANIES WHO HAVE ONLY ONE PRODUCT IN DEVELOPMENT, VOICE CLONING, TO ENGAGE IN THIS SORT OF REALLY THOUGHTFUL ANALYSIS OF THEIR PRODUCT PIPELINE?

YES.

I THINK IT IS.

I WOULD EXPECT WHOEVER RAN THAT BUSINESS TO FEEL THAT HE, SHE, THEY IN FACT NEEDED TO HOLD THEIR OPERATIONS AND THEIR ENTITY TO A HIGH STANDARD.

ABSOLUTELY.

ASHISH, DO YOU KNOW WHETHER OR NOT THERE IS ANYTHING OUTSIDE OF MICROSOFT, LIKE A BROADER CONSORTIUM OF COMPANIES THAT HAS SIMILAR POLICIES ABOUT WHAT CONSTITUTES RESPONSIBLE AI?

I DON'T KNOW IF THERE IS LIKE AN INDUSTRY GROUP WHICH IS ACTUALLY -- THERE IS A LOT OF THINKING AND I'M NOT -- YES, WE ARE ACTUALLY VERY CONSCIOUSLY TALKING ABOUT AI AND ETHICS PRINCIPLES.
THE OTHER BIG THING, I'VE ACTUALLY HEARD AND I DON'T KNOW HOW IT IS IMPLEMENTED, GOOGLE ALSO ACTUALLY TRIED TO OR HAS AN AI PRINCIPLES THERE. SO, I DON'T KNOW ABOUT THE CONSORTIUM BUT I KNOW THAT OTHER BIG TECH COMPANIES ARE ALSO THINKING -- AGAIN THE THING THAT I WANT TO EMPHASIZE HERE IS THAT, TRUST. IS A BIG CURRENCY. PURPOSE, AS THE NEW GENERATION MILLENNIALS COME NOT ONLY THE WORKFORCE BUT IN THE CONSUMER BASE, THOSE BECOME THE HIGH VALUE CURRENCY THAT WE AS BUSINESSES HAVE TO SUPPORT. IT'S THE RIGHT THING TO DO ALSO THE MARKET DEMANDING AT THIS POINT IN TIME. TO YOUR PREVIOUS QUESTION IS, EVEN IF IT'S SMALL COMPANY, I THINK THE CUSTOMERS OF THAT SMALL COMPANY ACTUALLY WANT THAT COMPANY. FOR A LONG TERM SUCCESS OF THAT COMPANY. SHORT TERM, FLY BY NIGHT OPERATORS, YES, IT MAY WORK. ANY SMALL COMPANY DO NOT THINK ABOUT THE CONSCIENCE OF A CUSTOMER AS CUSTOMER DEMANDED TODAY, IT'S VERY SHORT. >> ROSALYN, YOU TEACH ETHICS TO COMPUTER SCIENCE UNDERGRADUATE STUDENTS. >> ALL ENGINEERS. >> HOW DO YOU GET THEM TO RECOGNIZE WHEN THEY LEAVE IVA AND THEY GO WORK FOR A BUSINESS THAT THEY HAVE KIND OF A HIGHER -- HIGH RESPONSIBILITY THAN JUST THE BOTTOM LINE OF THE COMPANY? >> WELL, THEY MIGHT LEAVE WITH
THAT UNDERSTANDING BUT DEPENDING ON THE CULTURE OF THE COMPANY THEY MAY NOT OR MAY BE ABLE TO EXERCISE THAT UNDERSTANDING.
I HAVE AN EXAM PER OF STUDENT WHO WRONG LAST YEAR AND SAID, I WORK FOR THIS CONSULTING FIRM THEY PUT ME ON X, Y, Z, CLIENT I HAD TO DECLINE, WHEN WE TALKED ABOUT THIS, I DON'T FEEL LIKE I CAN DO THIS WITH FULL CONSCIOUSNESS.
SHE PAID A PRICE BECAUSE SHE GOT REASSIGNED TO A SCHOOL, WHICH WASN'T IN HER AREA OR WHERE -- ASPIRED.
SHE HAD TO DECIDE, OKAY, THAT'S ALL RIGHT.
I'M JUST GOING TO GO WHERE I'M TOLD BECAUSE I'M REALLY NOT GOING TO BE ABLE TO GO HERE ETHICALLY.
DEPENDING ON THE ORGANIZATION, DEPEND CAN ON THE CULTURE AND COMMITMENT, SOMETIMES CERTAINLY NOT IN THE CASE OF MICROSOFT, BUT SOMETIMES THE ETHICS CLAIMS ARE REALLY MORE ABOUT HOW DO YOU SAY IT, IMAGE.
THAN INTERNAL TO THE ORGANIZATION WHERE THEY ARE ACTUALLY ARE NOT REAL TRUE CHECKS AND BALANCES AND METRICS TO KNOW THAT'S THE CASE.
IT DEPENDS ON WHERE THEY GO.
THEY GET THEIR ASSIGNMENT AND GET THEIR CHECK AND THEY'RE HAPPY BECAUSE THEY'RE WELL PAID AND GOING TO GET A NEW HOUSE THEN ETHICS SORT OF FADES.
>> DO ANY OF YOU KNOW WHETHER OR NOT BUSINESSES THAT HAVE LOFTY ETHICAL STATEMENTS ACTUALLY PROVIDE PROTECTIONS FOR THEIR EMPLOYEES WHO MIGHT HAVE AN OBJECTION LIKE THAT?
SO EMPLOYEES CURRENT EMPLOYEES.

Let's take example of Rosalyn -- whistle-blower.

There was no whistleblowing here she didn't have the -- it was assault to her moral sense of moral commitments.

I wonder whether she couldn't have converted that into -- I don't know what she was being asked to do.

It was about -- a client that's bringing the pipeline in through imminent domain, some natural wilderness in people's farms.

In my class they went out and talked to those farmers and they learned about what was at stake. She said, I know about the people connected to this project and their lives, I don't want to work on it. So there was nothing illegal, nothing egregious or wrong she just said, I know too much about social implications of this project to feel good about it. What should she do?

Social implications to voice cloning technology.

Ashish, does Microsoft have any whistle-blower type protections?

We have actually not only have all processes in place, we are very robust mechanisms internally as well. Go through all kind of trainings as well. For people who may not know where to go to, if they find themselves in these kind of situations. We make it very accessible internally in Microsoft both
FROM MANAGEMENT PERSPECTIVE BUT HR AS WELL. I THINK WE ARE DOING PRETTY GOOD.

>> ENGINEERING STUDENT, UNDER GRAD GOES TO YOUR ETHICS CLASS THEY GO OFF INTO THE BUSINESS WORLD. HOW OFTEN DO BUSINESSES BRING IN ETHICISTS TO REFRESH THE TRAINING FOR THEIR EMPLOYEES.

>> THERE ARE COMPLIANCE OFFICERS, WHICH IS A LITTLE DIFFERENT. THAT'S MORE ABOUT THINGS LIKE BREAKING THE LAW, MISREPRESENTING THE COMPANY, MISAPPROPRIATING FUNDS, ET CETERA. I CERTAINLY HAVE COMMUNICATION WITH PEOPLE WHO ARE IN COMPLIANCE WHO ARE INTERESTED IN THAT. THAT'S GOOD.

I I IT MAY NOT GET TO SOME OF WHAT WE'RE CONCERNED ABOUT HERE EBB TERMS OF A COMMITMENT TO A HIGHER ORDER OF VALUES AROUND GREATER PROTECTIONS FOR INDIVIDUALS AND SOCIETY.

>> SOME OF THIS I THINK IS ALSO TERMINOLOGY. THAT IS A LOT OF WHAT HAPPENS NOW UNDER THE RUBRIC OF SUSTAINABILITY, I THINK WITHIN LIMITS SOME OF WHAT HAPPENS IN THE RUBRIC OF LEADERSHIP IS IN FACT AN ATTEMPT TO GET AT ETHICAL BEHAVIOR.

BOTH OF THOSE TERMS AT THIS POINT ANYWAY HAVE THE VALUE THAT WE DON'T THINK OF THEM AS PUNITIVE.

WHERE AS ETHICS ALWAYS COMES WITH THE CONNOTATION OF, YOU DID SOMETHING WRONG, NOT NECESSARILY
ILLEGAL BUT SOMETHING THAT FEELS INAPPROPRIATE. GIVEN THE CULTURE, WHETHER IT'S THE CULTURE WITHIN ORGANIZATION OR IN THE SOCIETY AT LARGE. AND SO IT'S HARD TO SELL ETHICS IN THE FACE OF THAT SENSE THAT THERE'S A VIOLATION FOR WHICH YOU WILL BE PUNISHED. AND WHEN WE TALK ABOUT LEADERSHIP WE TALK ABOUT SUSTAINABILITY. WE CAN TALK ABOUT MILLENNIAL VALUES ALL THAT HAVE FEELS SOMEHOW MORE EXPANSIVE AND -- >> SOCIAL RESPONSIBILITIES AND OTHERS. >> ABSOLUTELY. BUT ALL OF THAT TO YOUR QUESTION, DAN, IN FACT ALLOWS COMPANIES TO ADDRESS ETHICAL ISSUES. >> LET'S SAY I OWN A VOICE CLONING BUSINESS AND I'VE HIRED YOU TO COME IN AND GIVE ME MY LEADERSHIP OR ETHICS TRAINING ON HOW I SHOULD ASK RESPONSIBLY AND MY COMPANY'S ETHICS PROGRAM SHOULD LOOK LIKE. THE 30-SECOND SPEECH THAT YOU GIVE TO COMPANIES. >> WHY THEY "HAVE ETHICS OR WHAT -- >> WHAT SHOULD MY ETHICS PROGRAM LOOK LIKE? UNFAIR IN 30 SECONDS? >> I WOULD ACTUALLY -- I THINK MICROSOFT'S AI AND ETHICS COVERS MOST OF THE BASES, PRIVACY AND SECURITY, TRUSTWORTHINESS, THE IDEA OF ACCOUNTABILITY AND TRANSPARENCY. LOOKING AT HARMS AND DIGNITY, YOU KNOW, THOSE TYPES OF QUESTIONS THAT YOU WOULD ASK ABOUT WHO ARE THE MAJOR
STAKEHOLDERS, HOW IS VALUE CREATED OR DESTROYED. WHETHER MAJOR NORMS AND PRECEDENTS NEED TO BE AWARE OF HOW ARE RIGHTS DIMINISHED OR ENABLED. THOSE ARE THE BIG THREE. >> IF I'M A SMALL COMPANY AND I DON'T HAVE THE LUXURY OF HAVING SEPARATE AI GROUP IN MY ETHICS GROUP IN MY ORGANIZATION, WHO AM I GOING TO TURN TO HELP ME MAKE DECISIONS TAKE IT OUT OF MY PROFIT MOTIVE. >> BUT THAT'S MAKING THE ASSUMPTION THAT SOMEONE THAT IS TO COME FROM OUTSIDE AND LIKE CURE THE ILLS OF THE EVIL DOERS IN BUSINESS. I JUST DON'T THINK THAT MOST BUSINESSES -- I THINK THAT THEY -- I'M OF THE BELIEF THAT MOST OF THE COMPUTER SCIENTISTS OR CEOs THE LEADERSHIP TEAM IS ACTUALLY TRYING TO DO THE RIGHT THING THEY JUST DON'T HAVE THE FRAMEWORK TO SAY LIKE, HOW WOULD I THINK ABOUT WHAT'S RIGHT. I DON'T KNOW WHAT TO THINK ABOUT. THAT'S WHEN YOU START TALKING ABOUT STAKEHOLDER AND VALUE OR RIGHTS ENABLING LANGUAGE VERSUS LIKE AN EXTERNAL GROUP THAT NEEDS TO COME IN AND CORRECT THEM IN SOME WAYS. DOES THAT MAKE SENSE? JUST A DIFFERENT MODEL OF WHAT YOU THINK THAT THEY ACTUALLY WANT TO DO NATURALLY VERSUS WHAT YOU NEED TO PREVENT THEM FROM NOT DOING. >> I'M THINKING MORE THAT -- MICROSOFT IS VERY ADVANCED COMPANY. IT HAS GIVEN TONS OF THOUGHT TO
DEVELOPING AN ETHICS PROGRAM. PROBABLY BEYOND WHAT AN INDIVIDUAL STARTING A COMPANY HAS REALLY THOUGHT OF.

I PERSONALLY THINK THAT YOU HAVE TO HAVE A COST FOR MAKING CERTAIN TYPES OF CREATING AI. MY ARGUMENT, I'VE WRITTEN ABOUT THIS, IS THAT RIGHT NOW THERE'S ACTUALLY NO INTERNALIZATION OF THE COST OF DEVELOPING THESE TYPES OF ALMOST INFRASTRUCTURE COMPUTER PROGRAMS THAT PEOPLE RELY UPON IN THE MARKETPLACE OR IN SOCIETY.

SO JUST LIKE WE HAVE THE PROFESSIONALIZATION OF CIVIL ENGINEERS THAT CREATE BRIDGES, WE NEED TO HAVE THE PROFESSIONALIZATION OF COMPUTER SCIENTISTS BE REQUIRED TO BE ON CERTAIN PROG HOAX WOULD BRING IN THAT TYPE OF KNOWLEDGE.

EVEN IF YOU JUST HIRE TWO HOOD HE'S IN A GARAGE OFF THE STREET HAVE NO DEGREES WHATSOEVER BUT ARE GOOD CODERS HE CAN STILL HAVE SOMEONE WHO IS PROFESSIONAL THAT HAS THAT TYPE OF TRAINING THAT IS THEN RESPONSIBLE FOR THE ETHICAL IMPLICATIONS.

WE DO THIS WITH CPA, ENGINEERS. THERE'S LOT OF AREAS WHERE WE AS SOCIETY HAVE DECIDED THAT THESE TYPES OF MARKET DECISIONS ARE TOO CONSEQUENTIAL FOR SOCIETY THAT WE NEED TO HAVE A PROFESSIONAL PLACED AND RESPONSIBLE.

STATISTICS HAS THIS. THESE TYPE OF AREAS.

MY ANSWERS YOU HAVE ACTUALLY HAVE PROFESSIONALIZATION CLASS OF COMPUTER SCIENTISTS IN HIGH DEMAND.

BUT THAT'S DIFFERENT FROM WHAT
WE HAVE RIGHT NOW.
BUT THAT'S MY VISION FROM TEN
YEARS FROM NOW.
>> THIS IS JUST.
-- NOW MY SON WHO IS NOW IN
COLLEGE STARTED CODING IN LIKE
7th, 8th GRADE.
I AM DOING A MASTER'S FIRST TIME
I TOOK AN ETHICS COURSE IS LIKE
ETHICS IN ICT IN A GRADUATE
COURSE RIGHT NOW.
I THINK YOU HAVE TO PUSH THAT
WHOLE COURSE ACTUALLY TO A
MIDDLE SCHOOL STUDENT BECAUSE
RIGHT NOW THEY ARE CREATING CO
CODE.
THEY ARE THINKING ABOUT
TECHNOLOGY.
WE HAVE TO BRING THAT COURSE
CURRICULUM TO A LEVEL OF MIDDLE
SCHOOL AND ABOVE.
BECAUSE RIGHT NOW IF IT'S -- IN
GRADUATE SCHOOL IT'S ALREADY TOO
LATE.
>> WE WANT TO MAKE SURE THAT OUR
7th GRADERS CAN REFUSE TO DO
THE HOMEWORK.
>> THIS IS UNETHICAL.
>> HAVE ANY THOUGHTS ON THIS
BEFORE I GO ON TO THE NEXT
QUESTION?
>> NO.
I AGREE.
I THINK WE NEED TO PUSH THE
EDUCATION FURTHER DOWN THE
LADDER AND IF IN FACT STUDENTS
ARE CODING IN 7th GRADE,
ETHICS COMPONENT SHOULD BE A
PART OF THE CURRICULUM, THAT'S
WHAT'S HAPPENING IN THE THE
TERTIARY LEVEL NOW SO ETHICS, I
THINK FACTORS IN AND SERIOUS
REQUIRED WAYS TO WORK THAT
COMPUTER SCIENTISTS ARE DOING,
COMPUTER SCIENCE STUDENTS ARE
DOING IN THIS PROGRAM, YOU WOULD
KNOW THIS, TOO, RIGHT?
>> YES, I HAVE SOMETHING TO ADD. WHEN I THINK ABOUT MY STUDENTS, THEY OFTEN EXCITED ABOUT WHAT THEY CAN DO. THEIR MASTERY OVER THEIR CAPACITY TO CODE OR BUILD OR DESIGN SOMETHING. SAME WITH ENTREPRENEURS. THOSE WHO I KNOW ARE EXCITED ABOUT THE NEW IDEA AND HOW IT CAN DO WELL. I WOULD LOVE TO HAVE A CONVERSATION WITH THESE ENTREPRENEURS ABOUT, WHY ARE YOU IN THIS? AND WHY YOU'RE IN IT CAN YOU POSSIBLY BE THINKING ABOUT THE OTHER SIDE OF IT FROM THE USER'S PERSPECTIVE AND DO THE VALUES IN ANY WAY CONFLICT. I THINK A LOT OF TIMES WHEN WE RUN INTO ETHICS PROBLEMS IS BECAUSE WE HAVE CONFLICTING VALUES. SO, THE VALUE OF DISCOVERY, CREATION, MASTERY. MAY BE WOULD CONFLICT WITH THE THE VALUE OF SELF PROTECTION, INDEPENDENCE, AUTONOMY, THE ABILITY TO HAVE SOME CONTROL OVER YOUR PERSONAL, WHAT'S YOURS. AS A CONSUMER, I OFTEN FEEL THAT I HAVE LOST CONTROL AND I CAN'T GET IT BACK. DOES THAT MATTER TO THE PERSON WHO IS MASTERED THE CODE. DOES THAT MATTER TO THE ENTREPRENEUR WHO IS EXCITED ABOUT THE INVESTMENT OPPORTUNITIES. TO MAKE THIS PRODUCT GET INTO THE MARKETPLACE. THOSE COULD BE INTERESTING CONVERSATIONS IF PEOPLE ARE
WILLING TO HAVE THEM.

>> HOW DO YOU FORCE THOSE CONVERSATIONS?

>> YOU ASK THE FTC -- TO ENGAGE THE PUBLIC AT THE BEGINNING OF THE DEVELOPMENT OF THE NEW TECHNOLOGY, WHAT ABOUT THAT? IS THAT FAIR?

>> BUT IT'S ALSO PUBLIC DISCOURSE.

MICROSOFT IN FACT BECOMES A PLAYER IN THIS CONVERSATION WHAT YOU JUST PHRASED, ROSALYN, I THINK IS A RECOGNITION THAT SPECIFICALLY IN THE DOMAIN OF DATA, WE ARE NO LONGER JUST CUSTOMERS.

>> ABSOLUTELY.

>> WE ARE ALSO -- THE PHRASE SURVEILLANCE CAPITALISM SUDDENLY IS EVERYWHERE AND THERE'S A GOOD REASON FOR THAT.

>> YES.

>> RIGHT?

>> WE'RE ACTUALLY CONSEWELLERS, LIKE WE PAID MICROSOFT. IN OTHER AREAS WE'RE NOT A CONSUMER.

IF YOU LOOK AT THEIR 10K YOU DO SEARCH ON CUSTOMER, YOU FIND THREE INSTANCES BECAUSE THEIR CUSTOMER IS THE ADVERTISING AGENCIES, WE'RE NOT CUSTOMERS TO FACEBOOK OR ANYONE ELSE.

IT'S NOT -- WE USE THAT TERM LIGHTLY BUT THEY DON'T REFER TO US AS THAT AS THEY REPORT TO THE SEC OWE MICROSOFT IS A LITTLE BIT DIFFERENT.

THE MODEL IS A LITTLE BIT DIFFERENT.

>> WE HAVE A QUESTION FROM THE AUDIENCE ASKING, WHAT DOES MICROSOFT POLICE WHETHER USERS TEMPORARILY USING SOMEONE'S VOICE WITHOUT USING THEIR CONSENT OR
WITH THEIR CONSENT EVEN?
HOW DO YOU ENSURE THAT CONSENT
IS THEREAFTER THE FACT?
>> I'LL DEFER THAT QUESTION,
I'LL SHARE MY E-MAIL
THERE'S A LOT OF TALK ABOUT WHAT
CHANGES TO A CORPORATION'S
RESPONSIBILITY IS AND THERE WAS
A NEW DEFINITION OF WHAT A
CORPORATION IS SUPPOSED TO BE
OTHER THAN MAKING MONEY FOR
SHAREHOLDERS IS SUPPOSED TO HAVE
AN ETHICS RESPONSIBILITY.
RESPONSIBILITY TO SOCIETY.
DO YOU SEE THIS AS HAVING ANY
EFFECT ON COMPANIES THAT MIGHT
BE DEVELOPING VOICE CLEANING AND
RELATED TECHNOLOGIES?
SHOULD IT HAVE SOME SORT OF
EFFECT?
>> IT CERTAINLY SHUT.
AND I DON'T -- SHOULD.
I DON'T KNOW, WE HAVE SOMEBODY
IN THE ROOM ENGAGED IN THE
PRACTICE.
WHAT DOES SO THE BUSINESS
ROUNDTABLE AND LARRY FINK'S
LETTER WHERE HE FOCUSES ON
RESPONSIBILITY AND THERE'S BEEN
A SERIES OF TOPICS HE AND OTHER
BUSINESS LEADERS HAVE TOUCHED
ON.
The ASPEN PRINCIPLES, THE
FRAMEWORK THAT JUST CAME OUT OF
DAVOS WHICH IS THE SECOND
EDITION THAT LOOKS AT PRIVACY
ISSUES.
ALL THESE QUESTIONS ARE BEING
RAISED BY HIGH-PROFILE
INDIVIDUALS AND ORGANIZATIONS.
ONE WOULD LIKE TO BELIEVE IF YOU
HAVE ENOUGH CONVERSATIONS WITH
ENOUGH AUTHORITY FIGURES OR JUST
THE GENERAL PUBLIC ONCE THEY
START TAKING ABOUT STAKEHOLDER
VALUE RATHER THAN SHAREHOLDER IT
WILL HELP PEOPLE, PEOPLE BEING CORPORATIONS AND BUSINESSES PAYING MORE ATTENTION THAN PRIOR WAS THE CASE THAT NOTION OF SOCIAL RESPONSIBILITY.

YOU CAN ARGUE SOME CORPORATIONS HAVE ALWAYS HAD THAT COMMITMENT AND EXERCISED THAT COMMITMENT FOR A WHOLE RANGE OF REASONS. SOMETIMES IT COULD BE RELIGION. SOMETIMES IT'S JUST EDUCATION.

YOU HAVE A SENIOR STAFF INCLUDING A CEO THAT THOUGHT ABOUT THE ISSUES AND WANTS TO PRACTICE THEM.

I THINK THE PUBLIC CONVERSATION AND AGAIN THE WORKSHOP WOULD BE AN EXPRESSION OF THAT INTENT.

I THINK THAT COULD HELP.

I WOULD ALSO LIKE TO BELIEVE AND I THINK THE HISTORICAL EVIDENCE WOULD SUPPORT THIS, THAT WE ARE NOT SUDDENLY IN A NEW AGE WHERE WE'RE AWARE CORPORATIONS HAVE SOME RESPONSIBILITY TO THE REST OF SOCIETY.

PEOPLE HAVE TALKED ABOUT THAT FOR A LONG TIME AND THEY HAVE EXERCISED THAT TYPE OF RESPONSIBILITY FOR A LONG TIME.

>> IS THERE ANY LIMIT TO THE CORPORATE RESPONSIBILITY FOR VOICE CLOTH -- CLONING TECHNOLOGIES?

IS THERE THERE SOMETHING THAT PRESSES UP THE POSSIBILITY THAT CONTROL COULD BE LOST?

I USE A LOT OF FILM IN TEACHING. I THINK ABOUT THE FILM WAR GAMES AND THE WHOLE PURPOSE OF THE FILM WAS TO SUGGEST ULTIMATELY IT WAS MACHINE LEARNING THAT HAD TO SUPERCEDE HUMAN ERROR IN ORDER TO PROTECT US IN THE END.

WE HEARD A TALK EARLIER ABOUT MACHINE LEARNING AND THIS IS
Evolving in part because of the capacity of machine to learn. At some point is the corporation not going to be able to be responsible for this given the technology? I don't know. We need to think early in about design in the face of the possibility we won't have control. Like the number that showed up in my phone. >> It's a good question. >> Kirsten. >> The responsibilities distributed the users, firm and technology doesn't just disappear like the missing masses of Latour idea and if the developer of AI and machine learning and the program in the wild doesn't create a mechanism to give governance and judge and correct mistakes done in the wild if it's designed thane way to black box it. It's a design decision, is my argument and if thiy make that decision it can't be later used to identify judge and fix mistakes the developer's then responsible for everything that goes upon it's actually the opposite of the conversation going on which is it's black box it's inscrutable therefore nobody's responsible. My argument is if you design something to be indiscrutable and it will figure itself out but when we say no one's responsible that's the worse thing you can do. >> The way it place out invoice cloth -- cloning if I were to
UPLOAD HER VOICE SAMPLE TO MICROSOFT AND GO TO A FINANCIAL INSTITUTION SHE HAD AN ACCOUNT ON USING THE VOICE PRINT OF HER WOULD YOUR COMPANY BE LIABLE?
AS LONG AS THERE’S INTERVENTION AS WE ARE BUILDING WE NEED TO MAKE SURE THE STAKEHOLDERS AND SOFTWARE AND THE USER WHO MAY USING THE SOFTWARE BOTH HAVE MECHANISMS TO INTERVENE IN TO WHAT'S GOING ON IN THE SYSTEM IF THERE'S MECHANISMS FOR HER TO INTERVENE IN TO WHAT HAPPENED IS THE WAY WE SHOULD APPROACH THIS.
>> OR THE WAY YOU'RE DOING IT WHERE I'M NOT SURE IT'S USED IN A DIRECT FASHION OR COME TO ME. SO I'M NOT SURE WHAT'S GOING ON IN SOCIETY SO IN MICROSOFT I'LL HOLD IT CLOSER IN AND PUT IN THE CLOUD.
>> AS AN ANALYZING ENGINEER IT'S VERY HARD THE THINGS WE'RE TALKING ABOUT AND YOU'LL ATTEST TO THAT.
IT'S VERY HARD TO ONE THE WAY AI ESPECIALLY DEEP LEARNING MODELS ACTUALLY ARE BUILT AND WHY THE OUTPUT IS THE OUTPUT BECAUSE IT'S HARD TO EXPLAIN EVEN BY THE ENGINEERS AND RESEARCHERS BUILDING IT.
AND FORCING THEM IS HARD AS WELL BUT WE'RE HERE TO SOLVE HARD PROBLEMS SO EVENTUALLY WE'LL GET TO A PROBLEM OF SOLVING IT.
>> YOU DON'T THINK WE'LL SOLVE IT IN THE NEXT FIVE MINUTES OF THIS PANEL?
>> ONE THING THAT MAY HAPPEN IS WE WANT MORE HUMAN INVOLVE MANY IN THE USE OF THE MACHINE LEARNING SO IT'S NOT ROBUST AND NOT USE NEURAL NETWORKS THAT'S NOT EXPLAINABLE BUT USE A
REGRESSION EASILY IDENTIFIABLE
AND THE SENTENCING ALGORITHM
THAT WAS A BLACK BOX AND THERE'S
WAYS TO MAKE IT SIMPLE SO
THERE'S DUE PROCESS.
ONE PLACE THAT'S INTERESTING IS
INSURANCE AND HOW YOU ADJUDICATE
A CLAIM AND THEY'RE TRYING TO
USE MACHINE LEARNING IN WHO IS A
GOOD CANDIDATE AND ADJUDICATE A
CLAIM AND WHO YOU INSURANCE WITH
BUT INSURANCE IS HIGHLY
REGULATED BY THE STATE.
THEY'RE ACTUALLY VERY GOOD AT
EXPLAINING THE DECISIONS THEY
MADE BECAUSE THEY HAVE TO.
I WAS JUST AT SOMETHING AT
BENTLEY RECENTLY WHERE IN ALL
THE EXAMPLES THEY USED INSURANCE
AND WERE SHOWING ALMOST A
DASHBOARD OF HOW DECISIONS WERE
MADE WHETHER IT WAS SKEWING ONE
WAY OR ANOTHER.
HOW IT COULD BE FIXED.
THEY WERE CREATING A WAY THE
USER COULD BE INVOLVED THOUGH
THEY WERE USING PRETTY
SOPHISTICATED STUFF.
YOU CAN HAVE SOMETHING THAT'S
REALLY SOPHISTICATED BUT THERE'S
ALSO WAYS TO FIGURE OUT A
MECHANISM SO THE HUMAN COULD BE
MORE INVOLVED.
I'D LOOK AT THE PLACES THAT ARE
AT THE FOREFRONT OF THAT HIGHLY
REGULATED, INSURANCE IS ONE OF
THEM.
YOU HAVE EMPLOYMENT WHICH WILL
BE ANOTHER.
AT SOME POINT SOMEONE'S GOING TO
GET SUED AND THEY'LL HAVE TO GO
THROUGH DISCOVERY AND FIGURE OUT
A WAY WHERE WE'RE MAKING AI
DECISIONS AND HOW TO EXPLAIN IT.
>> INVOLVEMENT OF THE USER SEEM
IMPORTANT PRINCIPLES.
IN PREPARATION FOR THIS WORKSHOP
WE FOUND ON GITHUB A CODE
SOMEONE HAD CREATE FROM AN
ARTICLE ON VOICE CLONING THAT IS
NOW OUT THERE FOR SOMEBODY BAD
TO USE FOR ONE OF THE HORRIBLE
CRIMES THAT WAS MENTIONED.
HOW ARE WAYS OF DEALING WITH
THIS?
RIGHT NOW MOST RESEARCH IS
PUBLISHED WITH THE IDEA OF BEING
OPEN ABOUT YOUR MATERIALS AND
METHODOLOGY.
IS THAT SOMETHING THAT SHOULD BE
RECONSIDERED TO PREVENT DEEP
LEARNING PROGRAMS GETTING IN THE
WRONG HANDS?
>> PERSONALLY, AGAIN, I THINK
THE CODE THAT WE PUBLISHED
BECAUSE THERE'S SO MANY GOOD USE
CASES I'LL SAY WAY MORE THAN IF
YOU JUST DO THE BENEFITS AND
AGAIN, NOT ONLY WE DON'T KNOW
THE HARMS, RIGHT, AT THIS POINT
HOW THE TECHNOLOGY COULD BE USED
IN A HARMFUL WAY.
WE DON'T KNOW HOW THE TECHNOLOGY
CAN BE USED IN A GOOD WAY AND IT
COULD EVOLVE TO BE USED FOR
SOMETHING WHICH CAN CHANGE THE
WORLD.
PERSONALLY I THINK OPENNESS IS
VERY GOOD AND NOW THE MODEL OF
SAYING IF IT WERE USED AND
GITHUB IS ONE OF THE MICROSOFT
THINGS WE HAVE AN ACCEPTABLE USE
POLICY THERE WHERE THE CODE EVEN
IF IT IS USED IF IT'S FULL
LEARNING AND TRAINING PURPOSES
WHICH SHOWS IT CAN BE USED FOR
THOSE PURPOSES IT'S FINE BECAUSE
IT'S MORE FOR LEARNING AND
TRAINING AND IF IT'S USED FOR
NEFARIOUS PURPOSES WE HAVE TO
TAKE IT DOWN.
>> AGAIN IT'S AFTER THE FACT.
>> YES, BECAUSE AGAIN, IT'S HARD TO FIGURE OUT THE INTENT OF THE PUBLISHER AT THIS POINT. THE PUBLISHER HASN'T ANTICIPATED USE BY BAD HANDS.
>> IN OUR REMAINING MINUTE AND A HALF, LET'S GO BACK TO THE 30 SECONDS COULD EACH OF YOU SAY WHAT IF ANYTHING SHOULD BE DONE BY BUSINESSES, GOVERNMENT, INDEPENDENT INDUSTRY GROUPS, WHATEVER ACT YOU THINK IS APPROPRIATE TO ENSURE SOCIETY BENEFITS FROM VOICE CLONING TECHNOLOGIES BUT REDUCE THE LIKELY HARMs.

>> DO YOU CARE THE ORDER?
>> I DON'T CARE AT ALL.

>> SEEMS WE WANT ALL THE PLAYERS YOU JUST NAMED TO WORK TOGETHER TO MINIMIZE THE LIKELIHOOD OF HARM EVEN AS YOU RECOGNIZE THE POTENTIAL UPSIDE AND THE FIRST PLAN MADE IT CLEAR WHAT IT WOULD BE FOR A SMALL SEGMENT OF SOCIETY AND MORE BUT IF YOU WANT PUBLIC SECTOR AND PRIVATE SECTOR TO WORK TOGETHER TO MAKE THAT HAPPEN.

I DON'T THINK YOU WANT TO OVERLOAD THE RESPONSIBILITY ON ONE PLAYER OR ONE PARTICULAR GROUP OF PLAYERS.

AS A TECHNOLOGY COMPANY THEY SHOULD HAVE NOT JUST ENGINEERS BUT PEOPLE TAKING ABOUT THAT PARTICULAR PROBLEM THEY'RE TRYING TO SOLVE.

>> THE TWO THINGS THAT I THOUGHT OF IS INTERESTING DETECTION MODELS WHEN WE HAVEN'T CRACKED SINGING I THOUGHT THAT'S INTERESTING BECAUSE THAT'S AN AUTHENTIC WAY TO MAKE SURE IT WAS HUMAN.

ARE PEOPLE GOING TO START
SINGING LITTLE BO PEEP AND WE SAW THE DOG WAS FOOLED BY THE FAKE VOICE. CERTAIN DETECTION MECHANISM CAN THAN BE PROLIFIC THROUGH PHONES OR OTHER SPEAKER SYSTEMS TO BE ABLE TO IDENTIFY WHEN SOMETHING IS FAKE OR NOT IS MY FIRST THOUGHT.

PUT MORE EMPHASIS ON THAT. THE SECOND IS THE GOVERNMENT AND OTHER LARGE ORGANIZATIONS HAVE AN ABILITY TO CREATE THE DEMAND FOR GOOD TECHNOLOGY NOT JUST THROUGH REGULATION BUT TO SAY I WILL NOT DO BUSINESS WITH YOU UNLESS YOU HAVE THESE THINGS IN PLACE.

THAT'S A STRONG LIKE GOVERNMENT AS A GOVERNMENT ACT OR BIG CORPORATIONS SIMILAR TO WHAT WE TALKED ABOUT AT LUNCH WHEN MICROSOFT MAKES A STAND ON SOMETHING THEY SAY BY THE WAY THAT'S THROUGHOUT MY SUPPLY CHAIN AND WE'LL MAKE THAT A DECISION EVERYBODY HAS TO ABIDE BY.

THERE'S WAYS TO MAKE DEMAND FOR VOICE CLONING.

THE MORE THE GOVERNMENT CAN MAKE BIG DEMAND SAYING YOU HAVE TO ABIDE BY THESE PRINCIPLES IT WON'T STOP THE FRAUDSTERS ON GITHUB AND PULL DOWN BAD CODE BUT IT WILL STOP SOME PEOPLE WHO WANT TO GET THE GOVERNMENT'S BUSINESS.

THAT'S WHAT CAME TO MIND.

>> WHAT CONCERNS ME THE MOST ABOUT TECHNOLOGY ETHICS IS THE HUBRIS THAT CAN SOMETIMES COME ALONG WITH NEW TECHNOLOGICAL ADVANCES AND I WAS HEARTENED WHEN I HEARD SOMEONE FROM A TECH COMPANY SAYING THERE'S SOME
THINGS WE DON'T UNDERSTAND OR CAN'T CONTROL. THAT LEVEL OF HUMILITY TO ME IS WHAT OPEN THE DOOR FOR AUTHENTIC, OPEN CONVERSATIONS TO KNOW WHERE WE ARE AND GET TO WHERE WE WANT TO GO. WELL, THANK YOU ALL. IT'S BEEN THE MOST ETHICAL PANEL I'VE EVER BEEN ON. THANK YOU VERY MUCH. THANK YOU. [APPLAUSE] MY NAME IS WILL MAXIM AND WE HEARD ABOUT THE SCAMS AND EXTORTIONS AND THINGS THAT CAN HAPPEN WITH VOICE CLOTH AND WE TALKED ABOUT THE ETHICAL ISSUES AND WHAT BOUNDS COMPANIES AND WHAT THEIR OBLIGATIONS ARE FOR BALANCING THE PROS AND CONS. THE THIRD PANEL WILL HOPEFULLY TALK ABOUT HOPEFUL ASPECTS AND MITIGATION, DETECTION AND OUR ABILITY TO HOPEFULLY LET PEOPLE KNOW WHEN THEY'RE DEALING WITH A VOICE CLONE A FAKE SO THEY'RE LESS LIKELY TO BE SCAMMED OR A VOICE TO FOOL THEM. I ENCOURAGE EVERYONE TO GO ONLINE TO LOOK AT OUR -- ONLINE TO LOOK AT OUR PANEL'S FULL BIOS. I'LL DISTILL THEM AS I INTRODUCE. WE HAVE JOHN AMEIN VICE PRESIDENT AT ID&AND TO HIS LEFT NEIL JOHNSON A SCIENCE AND ENGINEERING TECHNICAL ADVISER CONTRACTOR FOR THE DEFENSE ADVANCED RESEARCH PROJECTS AGENCY ALSO KNOWN AS DARPA. TO HIS LEFT WE HAVE PATRICK TRAYNOR AS YOU KNOW A PROFESSOR IN THE DEPARTMENT OF COMPUTER
AND ENGINEERING AT THE UNIVERSITY OF FLORIDA AND CO-DIRECTS THE CYBER INSTITUTE AND JOINING US VIA SKYPE IS PROFESSOR SIWEI LYU AND DIRECTOR OF MACHINE LEARNING LAB AT ALBANY AND WE'LL HAVE A SHORT PRESENTATION FROM PROFESSOR LYU AND THEN HAVE A PRESENTATION ON DARPA'S PROGRAM AND JOHN WILL DO A SHORT DEMO OF DETECTION TECHNOLOGY AND THEN WE'LL HAVE TIME FOR PANEL Q&A. SO FIRST I'LL TURN TO PROFESSOR LYU. YOU CAN GET US STARTED. >> ALL RIGHT. CAN YOU HEAR ME CLEARLY? >> YES, WE CAN HEAR YOU. >> ALL RIGHT. GREAT. THANK YOU FOR THE INTRODUCTION. TODAY I'M GOING TO TALK ABOUT OUR RECENT WORK COLLABORATED WITH U.C. BERKELEY ON USING ANALYSIS TO RECOGNIZE FAKE VOICES. SO AS WE HEARD A LOT ABOUT SYNTHESIZED VIDEOS WE'RE SEEING A GROWING NUMBER OF FAKES. TO GIVE AN EXAMPLE, LAST SUMMER A COMPANY IN CANADA RELEASED SOME EXAMPLES OF AMAZINGLY HIGH QUALITY SYNTHETIC VOICE OF JOE ROGGAN. I'LL PLAY TWO VIDEOS. >> SOME NEED TO IMPROVE THE QUALITY OF YOUR EXISTENCE ON EARTH. YOU HAVE TO DO THE RIGHT THINGS. >> HEALTHY, LOCAL INGREDIENTS, FARM FRESH INGREDIENTS. >> ALL RIGHT. I DON'T KNOW. ANYONE WANT TO GUESS WHICH ONE'S REAL AND FAKE.
NEXT, PLEASE.

IT TURNS OUT THAT THE FIRST ONE IS THE SYNTHETIC VOICE AND THE SECOND IS THE REAL ONE.

THE QUALITY OF THE SYNTHETIC VOICE IT'S VERY DIFFICULT TO TELL THEM APART.

IT SHOWS WE'RE AT THE VERGE OF AI SYNTHESIZED VOICES BEING INDISTINGUISHABLE TO OUR EARS.

LATER LAST YEAR WE SAW THE FIRST REPORTS OF A FRAUD WITH SYNTHESIZED VOICES AND THIS IS CAUSING DAMAGES TO CONSUMERS AND COMPANIES.

BEFORE I TALK ABOUT HOW WE CAN ACTUALLY DEAL WITH THIS PROBLEM LET ME JUST GIVE YOU A ROUGH IDEA HOW SYNTHETIC VOICE CREATED.

I USED THE OPEN SOURCE GOOGLE WAVE LENGTH AS A BASIC MODEL.

THIS IS ONE OF THE MOST DOMINANT VOICE SYNTHESIZERS.

THE THERES TTS AND THE NETWORK TOGETHER WITH THE IMPULSE THAT HAS BEEN GENERATED.

THE SYNTHESIS IS SOLVED AS A

REDICTION -- PREDICTION AND PREDICTS WHAT THE SAMPLE WILL SOUND LIKE AND ALL THE PREVIOUS GENERATED SAMPLES.

SO CURRENTLY THE NEW NETWORK USES HUNDREDS OF VOICES IN THE CASE OF JOE ROGAN'S CASE AND TAKES WEEKS ON GPU SERVERS.

THE SYNTHESIS TAKES TIME.

NEVERTHELESS THE TECHNOLOGY IMPROVES AND THE EFFICIENCY OF AI VOICE SYNTHESIS WILL IMPROVE AND THEY'RE TRYING TO GIVE UP TO PROVIDE TECHNOLOGY TO RESIST THE PROBLEM.

I'LL BRAVELY DISCUSS OUR WORK IN THIS RESPECT WHICH IS CURRENTLY
SUPPORTED BY THE PRECURSOR DESCRIBED AFTER ME.
SO WE USE DIFFERENCES TO DIFFERENTIATE AI SYNTHESIZED AND REAL VOICES AND THIS IS WELL KNOWN IN THE NEURAL SYSTEMS. OUR EARS ARE SENSITIVE TO FACES OF SIGNALS.
LET ME EXPLAIN AT THIS POINT IN ANOTHER DETAIL.
LET'S CONSIDER A CONVERSATION LIKE IN THE PICTURE SHOWED HERE BETWEEN TWO SPEAKERS, TWO PEOPLE. NEXT, PLEASE.
NOW THE VOICE OF THE SPEAKER PROP -- HOWEVER THE DIRECT PATH BETWEEN THE SPEAKER'S MOUTH AND EARS IS NOT THE ONLY WAY SOUND PROPAGATES WE HAVE SOME IN OTHER DIRECTIONS AND THEN THEY BOUNCE FROM THE WALLS OR CEILINGS TO REACH THE LISTENER'S EARS. THE END RESULT IS THE LISTENER'S EARS RECEIVED SOUND WAVE FROM DIFFERENT SOURCES AT DIFFERENT TIMES BUT THROUGH DIFFERENT TRAJECTORIES. THIS IS DIFFERENCES IN THE SOUND WAVE.
SO WE CAN DETRACT USEFUL MESSAGES FROM THE SOUND WE HEARD INSTEAD OF SOUND WAVES ARRIVING. HUMAN EARS ARE MORE EVOLVED IN THE ARRIVING TIMES AND ONLY FOCUSSING ON THE MAGNITUDE OR LOCAL ENERGY THE SOUND WAVES CARRY TO HEAR SOMEONE TALKING CLEARLY THOUGH THE SPEAKER IS MOVING AROUND IN A ROOM. SO THIS IS A VERY INTERESTING OBSERVATION.
HOWEVER, AI SYNTHESIZED VOICES ARE GENERATED WITH A SPECIFIC NETWORK MODEL TO HAVE A DIFFERENT SIGNATURE THAN
DIFFERENT VOICES. BECAUSE THEY SIMULATE THE SAME MAGNITUDE AS HUMAN VOICES OUR BRAIN HEARS THE SOUND SIMILARLY BUT IF WE HAVE SOME WAY TO REVEAL THE DIFFERENCE IN FACES WE MAY BE ABLE TO IDENTIFY THE AI SYNTHETIC VOICES. SO OUR METHOD USES THE BISPECTRAL ANALYSIS AND WE USE VOICES TO EXPOSE THE DIFFERENCES IN THEIR FACES WE REPRESENT THE SOUND WAVES AS A COMBINATION OF PURE HARMONICS AND WE LOOK AT CORRELATIONS AMONG FREQUENCY COMPONENTS AND THEY'RE SENSITIVE THROUGH THE FACE DIFFERENCES THROUGH DIFFERENT SOUND WAVES. THE RESULT OF THE BISPECTRAL ANALYSIS ARE RealIZED AT THE BOTTOM OF THE SLIDES AND I WILL SKIP OVER THE DETAILS BUT WE CAN OBSERVE THAT THEY'RE VERY DIFFERENT CHARACTERISTICS AMONG HUMAN VOICES ON THE RIGHT COLUMN THAN ALL THE AI SYNTHESIZED VOICES TO GIVE UP A HOPE TO GIVE UP SOME WAY TO DIFFERENTIATE THEM USING FEATURES CAPTURED BY BISPECTRAL. WE WE USED THE BISPECTRUM ANALYSIS AND WE CAN SEE THE HUMAN VOICES WHICH CORRESPOND TO THE REGION HIGHLIGHTED CAN BE SEPARATED FROM THE SYNTHESIZED VOICES. THE CLASSIFICATION ACCURACY OF THIS METHOD IS AROUND 90% MEASURED. SO THIS SAY VERY PROMISING INITIAL RESULT BUT AS WE STUDY A LITTLE FURTHER IT'S HILTE -- HIGHLY AFFECTED BY HIGH FREQUENCY VOICES AN DEGRADATIONS. IT'S MY BELIEF THERE'S MORE TO
BE DONE IN THIS AREA THAN WE
HAVE DONE SO FAR.
SO THAT'S SOMETHING WE'RE
WORKING ON ACTIVELY ON THESE
DAYS.
NOW SOME CONCLUSIONS AND
DISCUSSIONS.
FIRST OF ALL, I HOPE HAVE YOU
CONVINCED AI ALGORITHMS ARE MAKE
THE GENERATION OF FAKE VOICES
EASIER THAN BEFORE THOUGH IT
STILL TAKES SOME TIME AND THESE
KIND OF FAKE VOICES CAN CAUSE
REAL DAMAGE TO CONSUMERS.
DEVELOPMENTS IN DIGITAL MEDIA
FOREENCE SICKS ARE PROVIDING
TECHNICAL TOOLS AND PROVIDE A
COUNTERMEASURE TO THE PROBLEM.
THE COMPETITION BETWEEN THE
MAKING AND DETACHING OF AI
SYNTHESIZED VOICE WILL BE GOING
ON FOR QUITE A LONG TIME AS A
CAT AND MOUSE GAME.
AS WE IMPROVE THE TECHNOLOGY THE
SYNTHESIS WILL ALSO IMPROVE.
BUT I THINK OVERALL LIKE
FIGHTING FAKE MEDIA IN GENERAL
AND DETECTING FAKE VOICES IS A
COMMUNITY EFFORT.
RESEARCHERS LIKE ME AND MY
COLLEAGUES WORK ON THIS BUT ALSO
REQUIRES INVOLVEMENT OF
COMMERCIAL COMPANIES DOMINANCE
AND USERS.
EVERYBODY TAKES THEIR DUE
DILIGENCE AND WE CAN HAVE THIS
PROBLEM UNDER CONTROL.
THAT'S MY HOPE.
THANK YOU VERY MUCH.
>> THANK YOU, PROFESSOR LYU AND
NOW WE'LL TURN TO JOHN ABOUT THE
DARPA PROGRAM.
>> INSIDE THE TECHNICAL ADVISER
FOR THE FORENSIC AND SEMANTICS
PROGRAM AT DARPA AND EVIDENCE
PRESENTED ARE BOTH PERFORMERS IN
OUR METAPHOR PROGRAM AND WHAT METAPHOR IS ABOUT AROUND DETECTING WHAT WE CALL MANIPULATIONS IN IMAGE AND VIDEO. MANIPULATIONS COULD BE COMPLETELY SYNTHETIC OR PARTIALLY OR CHEAP FAKESS, PHOTOSHOP. ADDING FRAMES, REDUCING FRAMES TO SPEED UP VIDEO, ANYTHING IN BETWEEN, ADDING, REMOVING OBJECTS. SO THERE'S DIFFERENT LEVEL OF COMPUTE AND SKILL THAT IS REQUIRED IN THESE DIFFERENT AREAS. HOPEFULLY YOU GOT THERE'S SKILL INVOLVED IN BUILDING THESE FROM SCRATCH. IF WE'RE GOING TO BUILDING MORE AND WE HEARD SNIPPETS OF PRE-FORMED VERBIAGE OR A GROUP OF SAMPLES FROM FIVE-SECONDS EACH PRODUCING SOME KIND OF SOUND. ARE THEY COMPELLING? ARE THEY GIVING CADENCE? THERE'S OTHER FEATURES BEYOND PITCH AND VOLUME THAT ARE DYNAMIC TO OUR VOICE. WE ARE LOOKING AT THE NEXT PROGRAM COMING OUT OF DARPA THIS SUMMER. WE'RE LOOKING ACROSS ALL MODALITIES. YOU CAN'T LOOK AT AUDIO WITHOUT OTHER CONTEXT. WHAT STORY'S BEING TOLD. WHAT'S THE MESSAGE BEING PLAYED. WE'RE LOOKING AT VISUAL CONTENT FROM THE SAME TYPE PERSPECTIVE. WE CAN'T LOOK AT A VIDEO AND ANALYZE THAT SUFFICIENTLY WITHOUT CONSIDERING THE AUDIO UNDERNEATH THE HOOD AND AUDIO'S
MUCH MORE THAN SPEED.
IT'S THE ENVIRONMENTALS AND
ATMOSPHERICS AND THE INFORMATION
CAPTURED THEREIN THAT TELLS US
ABOUT THE ENVIRONMENT.
I ALLUDED TO THIS AS THE
REVERBER ECHO THAT ENTERS OUR
EARS, OUR SENSORS THAT COLLECT
THIS INFORMATION THAT GIVES US
SOME KIND OF UNDERSTANDING.
WHAT I'M SHOWING YOU ON THE
SCREEN RIGHT NOW ARE SOME MANUAL
MANIPULATIONS THAT HAVE FOOLED
PEOPLE.
WE HAVE THE SHOOT DOWN OF MA-17.
THERE WAS A SMALL GROUP LOOKING
AT MEDIA AND THE RUSSIANS
REPORTED UKRAINIANS SHOT DOWN AN
AIRCRAFT.
THIS IS THE IMAGE THEY SHOWED.
IT WAS PROVEN THE AIRCRAFT THE
JUMP JUMP -- JUMBO JET ISN'T
THE SAME AND THE AIRCRAFT THAT
CLAIMED TO HAVE SHOT DOWN THE
JUMBO JET ISN'T THE SAME ONE
THAT WAS CLAIMED AND THIS IS AN
IMAGE FOUND ON GOOGLE EARTH AND
TURNED TO GRAY SCALE AND CLOUD
WERE ADDED USING PHOTOSHOP.
THE IMAGE A PROTEST AND THE FLAG
WAS ADDED AGAIN USING PHOTOSHOP.
IT'S A PROTEST POSSIBLY
SOMewhere ELSE IN THE WORLD BUT
THE FLAG WAS ADDED TO ELICIT AN
EMOTIONAL RESPONSE AND WE'RE
STARTING TO SEE THE SAME THING
WITH VIDEO AND AUDIO COMBINED
WITH THE IMPERSONATION OF OBAMA
AND JORDAN PEELE, FAKE SOCIAL
MEDIA AND HERE WE ARE LOOKING AT
AUDIO.
VOICE, CLONING VOICE.
CLONING IS ALONG THE LINE OF
SAMPLING.
I WANT TO TAKE SAMPLES OF
SOMEONE'S VOICE AND BUILD
SOMETHING UP FROM AND CLONE THEIR INFORMATION OPPOSED TO SYNTHETICALLY GENERATE I POINTED TO A COMPANY AND IF I GO TO FAKE JOE ROGAN.com YOU'LL GET INTERESTING SAMPLES AND IT'S HARD TO TELL THE REAL VOICE AND SYNTHETIC RULE AND THEY'LL BOTH FOOL SPEAKER I.D. SYSTEMS AND THEY'LL BOTH SAYING THESE JOE ROGAN AND WE HAVE BERKELEY AND OTHERS WORKING ON DIFFERENTIATING SPEAKER AND SYNTHETIC. THIS IS AN EXAMPLE WHERE A U.K. COMPANY WAS EXTORTED OVER $200,000 EQUIVALENT BECAUSE SOMEONE WAS ABLE TO SPOOF THE CEO'S VOICE FOR THE WIRE TRANSFER. WE'RE LOOKING ACROSS MODALITY. THE INTENT IS WE'RE EXPECTING DISINFORMATION AND FAKE NEWS TO BE AROUND US FOREVER. IT HAS BEEN SINCE WE CAN COMMUNICATE WHEN PEOPLE LIED TO ONE ANOTHER. IT'S NOT GOING CHANGE. WE'RE GOING LIVE WITH IT. WHAT CAN WE DO TO ENSURE WE HAVE TRUST IN WHAT WE SEE AND HEAR? WE STARTED THAT WITH METAPHOR PROGRAM IN IDENTIFYING MANIPULATED OR REAL IMAGE AND VIDEO BUT WE NEED TO GO BEYOND THAT BECAUSE A LOT OF THE DETECTERS OF ANALYSES THEY'RE IN RELY ON STATISTICAL FEATURES FRAGILE DUE TO RECOMPRESSION. HOW MANY TIMES CAN A VOICE GET EXPRESSED OR VIDEO. YOU GO FROM HIGH QUALITY YOUTUBE TO CELL PHONE AND RE-ENCODE IT SEVERAL TIMES THROUGH SOCIAL MEDIA.
WILL WE HAVE DEGRADATION?
YES, I BET WE WILL BUT THERE'S
OTHER CHARACTERISTICS AND
FEATURES THAT SURVIVED AND WE
REFER TO THEM AS SEMANTIC
FEATURES.
IT TELLS US ABOUT THE CONTACTS
UNDER THE HOOD AND WHY IS THE
INFORMATION BEING CONVEYED FROM
SENSOR TO CONSUMER.
I'M SHOWING YOU ON THE BOARD A
TIME LINE OVER A FEW MONTHS OR
THE LAST TWO YEARS WHERE THERE'S
BEEN A HUGE ADVANCEMENT IN
GENERATIVE MEDIA.
GOOGLE DUPLEX HAS COME OUT WITH
A SYNTHETIC VOICE.
IT'S NOT INTENDED TO REPLACE A
SPEAKER'S VOICE BUT THERE'S
PAUSES, UMS AND AHS INTRODUCED,

CADENCE CHANGES.
THE INTENT IS TO USE THE
SYNTHETIC CHAT AS A WAY TO
CORRESPOND WITH OTHERS TO SET UP
YOUR AN APPOINTMENT AND GOOGLE,
MAKE ME AN APPOINTMENT AND THIS
PROXY WILL CALL ON YOUR BEHALF.
WE'VE SEEN FACES BEING DRIVEN BY
PUPPET MASTERS IN FACE TO FACE.
IT'S A TYPE OF DEEP FAKE.
DEEP FAKE THE WORD'S BEEN
HIJACKED TO MEAN ANYTHING
SYNTHETIC TO PARTIALLY SYNTHETIC
TO WHERE IT LOOKS REALISTIC BUT
ISN'T AND IS BECOME TERM SIMILAR
TO HOW WE ALL UNDERSTAND HATE
NENE PHOTO -- WHAT IT MEANS TO
PHOTOSHOP SOMETHING.
IT'S NOW A VERB.
DEEP FAKE IS BECOMING MEDIA,
VISUAL, AUDIBLE THAT RESEMBLES
SOMETHING ELSE THAT WE HOLD TO
BE TRUE BUT IT ISN'T.
WHAT'S INTERESTING ABOUT THIS IS
ANYTHING YOU SEE ON THE SCREEN
IS GENERATED.
THIS PERSON DOES NOT EXIST.
THAT AIRBNB DOES NOT EXIST.
THE TEXT DOES NOT EXIST.
BUT THERE ARE SEMANTIC ERRORS
THAT COMPUTERS GENERATE EITHER
IN THE CONSTRUCTION OF THE MEDIA
THAT WE CAN USE AS FEATURES FOR
DETECTION OR IN THE CONTEXT OF
THE TEXT FOR OTHER SEMANTIC
RELATIONSHIPS OF THE CONTEXT
THAT CAN BE TRIGGERED ON TO TELL
US WHETHER IT'S A REAL EVENT OR
REAL SITUATION OR NOT.
IT'S THE OBJECTIVE THE SEMANTICS
FORENSICS PROGRAM GOES TO ALL
MODALITIES, VIDEO, AUDIO, TEXT
BUT IN CONCERT IN TO WHAT
STORIES ARE BEING TOLD.
WHAT ARE THE THREADS OF TRUTH
BEING CONVEYED IN MESSAGES THAT
ARE SENT.
THIS SAY PROBLEM NOT JUST FROM A
PERSPECTIVE, THIS SAY WORLD WIDE
ISSUE.
SOCIAL MEDIA PLATFORMS ARE THE
FRONTLINE.
THAT IS WHERE MESSAGES ARE
GETTING CONVEYED LATCHED ON TO
AND DISSEMINATE.
ALL WE WANT TO DO AT DARPA AND
COUNTER FAKE NEWS AND
INFORMATION AT SCALE.
AND PLACE TRUST VALUE IN THE
MEDIA BEING PRODUCED AND STORIES
BEING TOLD?
THANK YOU.
>> THANK YOU, NEAL.
NOW WE'LL HEAR FROM JOHN WITH A
DEMO OF DETECTION TECHNOLOGY.
>> WELL, MY NAME IS JOHN AMEIN
WITH IR R&D.
IT MAY NOT BE THE SEXIEST NAME
IN THE WORLD BUT IT'S AT LEAST
VERY EFFICIENT BECAUSE IN FOUR
LETTERS WE TELL YOU WHAT WE DO,
IDENTITY, RESEARCH AND DEVELOPMENT. THAT'S OUR FOCUS. SPECIFICALLY BIOMETRICS. SO THE CAPABILITIES THAT WE HAVE IN THE AREA OF BIOMETRICS ARE INVOICE BIOMETRICS. FOR EXAMPLE, WE TALKED A NUMBER OF TIMES HERE ALREADY HOW YOU CAN MATCH A VOICE. YOU HEAR A VOICE SIT THAT PERSON'S VOICE. I HAVE ON MY PHONE AS I OPEN AN APP HERE OLD CHICAGO WHITE SOX. IT'S SUPPOSED TO MATCH ME AND YOU CAN SEE THAT IT DID MATCH ME. THAT'S ONE EXAMPLE OF WHAT WE DO. HOWEVER, THERE'S A MAJOR PROBLEM WITH JUST DOING THE MATCHING. THE OBVIOUS THING BEING THAT IT COULD BE SPOOFED. SOMEONE CAN BE RECORDED OR SYNTHESIZING YOUR VOICE AND ONE THING WE PUT EFFORT IN IS VOICE ANTI-SPOOFING. OTHER THINGS WE DO, WE ALSO DO FACE ANTI-SPOOFING. IF YOU'RE DOING FACE RISKABLE TO KNOW WILL OR NOT IT'S A PHOTOGRAPH OF A PHOTOGRAPH OR IF THE CAMERA'S TAKING A PICTURE OF A LIVE PERSON. THESE ARE SAME KINDS OF THINGS WE NEED TO DO IN THE FACE WORLD AND THIS IS OUR BUSINESS. THIS IS WHAT WE DO. WE SELL THIS SOFTWARE TO ENABLE OTHER COMPANIES TO CREATE AUTHENTICATION SYSTEMS. SO I'M NOT SURE HOW WELL YOU CAN SEE THIS PARTICULAR CHART BUT THE POINT OF THE CHART IS TO SHOW YOU HOW YOU MEASURE THE EFFECTIVENESS OF ANTI-SPOOFING
AND FORTUNATELY THERE'S A GLOBAL ORGANIZATION CALLED INTERSPEECH THAT INVESTS IN FIGURING OUT HOW TO TEST THESE KINDS OF ANTI-SPOOFING SYSTEMS TO MEASURE THE EFFECTIVE NESS OF THEM. THEY'RE RUNNING THIS COMPETITION THERE WERE 49 COMPANIES AND ONE FROM 2019 IN MARCH AND THERE'S TWO AXES BECAUSE IF YOU'RE TRYING TO DETECT A SYNTHETIC VOICE WHAT CAN HAPPEN? THE SYSTEM CAN GET IT RIGHT OR WRONG. HOW CAN IT GET IT WRONG? ONE OF TWO WAYS. ONE AXIS HERE I GOT IT WRONG BECAUSE IT WAS SYNTHETIC VOICE THAT I MARKED AS A REAL VOICE. THE OTHER AXIS IS THE OPPOSITE. IT WAS A REAL VOICE BUT I CALLED IT SYNTHETIC. SO THAT'S WHAT THAT CHART IS. THE IDEA IS THAT YOU WANT TO BE AS CLOSE TO ZERO AS POSSIBLE. THESE ARE THE TWO KINDS OF ERRORS AND EVERY SYSTEM WILL INTEREST A TRADE-OFF BETWEEN THE TWO ERRORS. YOU MEASURE THE SYSTEMS AND YOU GET SCORES BACK AND BECAUSE THE DATA IS LABELLED ON INPUT SIDE YOU KNOW WHETHER OR NOT THE SYSTEM WAS ACCURATE. THAT'S THE PURPOSE OF THE CHALLENGES. AND YOU CAN SEE THAT WE WERE HERE AT CLOSE TO ZERO WHICH IS WHY I THINK WE GOT INVITED TO THIS EVENT. WE ARE THE MARKET LEADER IN TERMS OF TECHNOLOGY THROUGH THIS GLOBAL INTERSPEECH EVENT. SO WHAT I WANT TO TALK ABOUT NOW IS WELL, OKAY, HOW CAN YOU DETECT THIS SYNTHESIZED VOICE.
IT TURNS OUT ONE OF THE FIRST
WAYS TO DO IT IS THE FACT THAT A
SYNTHETIC VOICE IS NOT COMING
FROM A BODY AND WE HAVE
TECHNOLOGY TO DETERMINE WHETHER
OR NOT SPEECH IS COMING FROM A
REPRODUCTION DEVICE, FLAT,
surface loud speaker versus the
human vocal tract and that's an
over simplification of what
makes these things different but
in fact we are able to make that
distinction between a played
back voice whether synthetic or
real and a real human voice.
so with that i'm actually going
to ask you to play the video.
I had to make a quick and dirty
video of me showing a few
eamples.
>> the worse job of flying
around the world being away from
my family recording 10 minutes
of audio.
>> that was ellen, you may have
recognized.
that was totally synthesized.
>> and the worse part of my job
is being away from home and
recording video.
>> that was me.
>> my voice may be generate
computer but i think it sounds
pretty human.
i don't know exactly how they
made it but i'm really
impressed.
>> that's an app on my iphone if
anybody would like it have that
app i can enable it for you as a
test flight.
those are one of the ways we can
detect synthetic voice.
however, a lot of the examples i
think we talked about already
like you're downloading
SOMETHING FROM THE INTERNET OR WHATEVER, THEN YOU'RE NOT GOING TO BE PLAYING THAT BACK THROUGH ANOTHER DEVICE THAT IS THEN GOING TO BE ABLE TO DETECT IT. IT'S A DIRECT PLAY. FOR THAT WE HAVE TO TAKE ANOTHER APPROACH. THAT APPROACH IS TO LOOK AT THE ARTIFACTS IN SYNTHETIC SPEECH. SO THE PREVIOUS SPEAKERS ACTUALLY TALKED ABOUT THAT. THERE ARE ARTIFACTS AND WE LOOK AT THEM AND I WISH I COULD TELL YOU MORE OF EXACTLY WHAT WE'RE LOOKING AT BUT I DO NOT WANT TO DO THAT ON A PUBLIC RECORD SO I'M NOT GOING TO OTHER THAN HERE'S A VISUAL TO GIVE YOU AN IDEA. THERE'S SOME FREQUENCY DOMAIN KINDS OF THINGS THAT ARE DIFFERENT BETWEEN THE SYNTHESIZED VOICE AND HUMAN VOICE AND THERE'S ALSO CERTAIN OTHER THINGS I THINK YOU MENTIONED PHASE INVERSIONS. THAT'S ONE OF THE THINGS WE'RE LOOKING AT IN OUR TECHNOLOGY AND SOME OTHER THINGS THAT FRANKLY SYNTHETIC SPEECH IS A LITTLE TOO PERFECT. THAT'S ONE OF THE THINGS THAT COMES THROUGH WHEN YOU DO THIS ANALYSIS. ONE THING THAT WORRIES ME A LITTLE BIT BECAUSE I'M SURE THE CLONING TECHNOLOGY WILL MAKE IT LESS PERFECT SO IT'S MORE HUMAN. THIS IS THE OTHER THING WE DO WITH THE TECHNOLOGY. THE WAY OUR ENGINE WORKS AND I THINK THIS IS WILL BE TRUE OF ANY ENGINE COMBINED NEURAL NETWORKS LOOKING AT SPEECH AND FUSING A RESULT AND PROVIDING A
SCORE.
THAT'S ALL OUR SOFTWARE DID.
YOU GIVE IT INPUT AND IT COMES OUT WITH A SCORE AND PROBABILITY OF HOW LIVE IS IT VERSUS NOT LIVE.
ONE OF THE KEY THINGS THAT IS REALLY CRITICAL I THINK IT CAME UP SEVERAL TIMES IS DATA.
HAVE TO HAVE A LOT OF DATA.
THIS IS ONE OF THE REASONS WHY WE WERE SUCCESSFUL IN THESE TESTS IS BECAUSE THE AMOUNT OF PUBLICLY AVAILABLE DATA IS BACK IN LATE 2018, WE DIDN'T HAVE THAT MUCH MORE DATA THAN WAS AVAILABLE PUBLICLY WHERE YOU CAN BE EITHER BUY IT OR RESEARCH UNIVERSITIES AND PROVIDE THIS KIND OF DATA IT EACH OTHER, THAT SORT OF THING.
WE INVESTED BECAUSE IT'S OUR BUSINESS IN A CORE TEAM OF PEOPLE THAT COLLECTS DATA OF ALL KINDS OF BIOMETRICS DATA AND WE NOW HAVE A VERY LARGE CORPUS WE USE AS PART OF OUR WORK. THIS IS AN ONGOING EFFORT FOR SURE.
SO THE LAST THING I THINK I CAN MAKE THIS PLAY.
I DO HAVE SOME EXAMPLES OF SYNTHESIZED SPEECH WE RAN THROUGH THE SOFTWARE DIRECTLY LIKE IN OUR API CALL AND DETECTED ALL OF THESE ARE SYNTHESIZED AND YOU HEARD SOME OF THE TECHNOLOGIES MENTIONED EARLIER FROM GOOGLE AND THE WAVE NET FROM GOOGLE AND THE OTHER AND I DON'T KNOW HOW TO MAKE THEM PLAY.
>> MY VOICE MAY BE GENERATED BY A COMPUTER BUT I THINK IT SOUNDS PRETTY HUMAN.
I DON'T KNOW EXACTLY HOW THEY
MADE IT BUT I'M REALLY
IMPRESSED.
>> A SINGLE WAVE NET CAN CAPTURE
THE CHARACTERISTICS OF DIFFERENT
SPEAKERS WITH EQUAL FIDELITY.
NOW IT'S FAST.
GEORGE WASHINGTON WAS THE FIRST
PRESIDENT OF THE UNITED STATES.
SO THAT'S IT.
THIS IS THE DEMO I ALREADY
SHOWED YOU.
WITH THAT I GUESS I WANT TO SAY
I TOTALLY AGREE WITH THE
PROFESSOR EARLIER THIS IS GOING
TO BE A CAT AND MOUSE GAME.
THIS IS NEVER GOING TO END
COLLECTING DATA, IMPROVING
ALGORITHMS AND WORKING TOGETHER
IS WHAT IT'S GOING TO TAKE TO
DETECT AND PREVENT VOICE CLONING
FROM BECOMING A HAZARD AND
HARMFUL TO ALL OF US.
THANK YOU.
[APPLAUSE]
>> THANK YOU, VERY MUCH, JOHN.
ALSO I'LL MENTION IF YOU HAVE
QUESTION FOR THE PANEL AND PRIOR
PANELS IF YOU CAN WRITE THEM
DOWN I'LL TRY TO WORK THEM IN A
LIMITED AMOUNT OF TIME.
MY FIRST AND PREVENT VOICE CLONING
FROM BECOMING A HAZARD AND
HARMFUL TO ALL OF US.
THANK YOU.
( APPLAUSE )
>> THANK YOU VERY MUCH, JOHN.
IF YOU HAVE QUESTIONS FOR THE
PANEL, LIKE THE PRIOR PANELS, IF
YOU CAN WRITE THEM DOWN AND GET
THEM DELIVERED AND I'LL TRY TO
WORK THEM OUT.Ñi
>> SO NO MATTER HOW THE
DETECTION METHOD WORKS ACCURATE,
THE CLEAN EXAMPLES, THEY MAY OR
MAY NOT GENERALIZE THROUGH THESE
KIND OF CASES.
SO THE SECOND POINT I WANT TO MAKE IS, YOU KNOW, THIS EVALUATION MAY OR MAY NOT BE THE UPKIND OF EVALUATION WE'RE INTERESTED IN, YOU KNOW, ARE RELEVANT. WHICH PART OF THIS VOICE IS WRONG, WHY WOULD WE THINK THIS IS NOT A REAL VOICE? SO THE KIND OF ACROSS-THE-BOARD EVALUATION MATCHUP WE'RE USING NOW PROBABLY IS NOT ACCURATE TO REFLECT THE P PERFORMANCE OF THIS ALGORITHM OF INDIVIDUAL VOICE SAMPLES. AND THEN I THINK, YOU KNOW, WHAT NEIL IS SAYING IS LOOK BEYOND THE SIGNAL. WE LOOK FOR SOMETHING THAT IS MORE SEMANTIC, MORE ROBUST AND HARDER TO FAKE. TO THOSE ARE, I THINK, MY COMMENTS ON THIS. >> SO YOU'RE BOTH TALKING SOMETHING ABOUT -- YOU KNOW, THE BACK AND FORTH AND SEMANTIC PART OF DETECTION, DOES THAT MEAN YOU THINK IT'S MORE LIKELY THAT WE WOULD HAVE TO HAVE BACK AND FORTH TO IDENTIFY WHERE SOMETHING IS A.I. OR IS IT POSSIBLE WE'RE GOING TO BE ABLE TO USE THE ANALYTICS WITHIN THE AUDIO TO DETERMINE WHETHER IT'S A CLONE VOICE OR NOT? >> CAN I THROW IN A GREAT "IT DEPENDS"? ( LAUGHTER ) >> THAT'S WHERE I'M GOING. ONE TO HAVE THE REASONS WE WANT TO DO THAT IS A LOT OF THIS IS FOCUSED ON SOCIAL MEDIA. I THINK WE'VE LEFT OUT WHAT WAS JUST HIT UPON AND THAT IS ROBOCALLS AND TARGETED PHISHING OVER THE PHONE WHERE AUDIO IS
GOING TO BE INCREDIBLY
COMPRESSED.
IT WON'T SOUND AS GOOD AS SKYPE
USUALLY DOES, CERTAINLY ANYTHING
ON MY MOBILE NEVER SOUNDS THAT
GOOD.
YOU HAVE VERY LITTLE CONTEXT
THERE.
BUT THINGS THAT WOULD HELP THERE
WOULD NOT JUST --
( TECHNICAL DIFFICULTY )
-- IN THAT IS IT CONSISTENT WITH
THE SOURCE THAT WE ARE EXPECTING
IT TO COME FROM.
EITHER THE STORYTELLER, THE NEWS
ORGANIZATION, THE AUTHOR OR THE
SPEAKER.
AND THEN THERE'S
CHARACTERIZATION.
YES, WE ARE EXPECTING DATA THAT
COMES OFF THE INTERNET TO BE
MANIPULATED, COMPRESSED,
ENHANCED SOME WAY OR DEGRADED.
DO WE CARE?
IS THE MANIPULATION OR
AUGMENTATION DONE WITH MALICIOUS
INTENT?
IS IT CHANGING THE STORY THAT'S
BEING TOLD?
IF SO, WHAT'S BEING DONE AND HOW
DO WE DETECT THAT.
VERY HARD PROBLEMS.
IT'S ONE REASON IT'S A DARKER
PROBLEM.
( LAUGHTER )
THANK YOU.
SO THE CHARACTERIZATION PIECE IS
JUST AS IMPORTANT AS THE
DETECTION PIECE BECAUSE IT HELPS
US NARROW DOWN WHAT WE NEED TO
FOCUS ON AND THIS IS ANOTHER
REASON WE CAN'T LOOK AT ONE
MODALITY WITHOUT ANOTHER WHEN
WE'RE CONSIDERING EVENTS AND
STORIES THAT ARE BEING CONVEYED,
RELAYED NEWS OR POTENTIAL
ACTIONS THAT HAVE HAPPENED INTERNATIONALLY.
>> COULD I ADD TO THAT?
BECAUSE I THINK THE QUESTION WAS AROUND CAN WE DETECT, AND WE CANNOT DETECT PERFECTLY, AND THAT'S -- BUT THAT'S TRUE OF MANY THINGS.
MANY THINGS AROUND SECURITY.
IF YOU TALK TO ENTERPRISE SECURITY EXPERTS,
EXPECTING 100% PERFECTION,
DETECTION AUTHENTICATION.
SO WHAT DO THEY DO?
THEY COMBINE MULTIPLE METHODS
AND WE STRONGLY ENCOURAGE HAVING VOICE AND FACE FOR EXAMPLE AS AUTHENTICATION BECAUSE IT WILL
NEVER BE PERFECT.
YOU MAY NOT BE ABLE TO DETECT CLONED VOICE SO YOU MAY BE ABLE TO COMBINE FACTORS.
ENTERPRISE SECURITY PEOPLE KNOW THIS.
THEY PUT IN STRATEGIES TO IMPLEMENT EXACTLY THOSE THINGS,
MAYBE WE HAVE TO DO MORE TO HELP CONSUMERS BE ABLE TO LEVERAGE THAT KIND OF CAPABILITY, TOO.
>> PROFESSOR TRAYNOR MENTIONED THE PROBLEMS WITH THE VOICE CLONES WITH ROBO CALLS AND AUTOMATED CALLS.
RIGHT NOW WE HAVE ON THE MARKET ANALYTICS PRODUCTS THAT ARE OVER THE TOP, USING ANALYTICS TO COMPLAINTS OR WHAT IS THE CALLER I.D. NUMBER, WHAT DO WE KNOW ABOUT THE CALL, SIT POTENTIALLY SCAM OR A FRAUD.
COULD THE KIND OF I.D.
TECHNOLOGY THAT YOU CAULKED ABOUT HERE BE IMPLEMENTED WITH THE OTHER ANALYTICS TO TRY TO CREATE A BETTER PICTURE OF WHETHER A CALL THAT'S COMING IN,
LISTENING TO THE AUDIO OF THE MESSAGE THAT'S PLAYING, WHETHER OR NOT THAT'S LIKELY A SCAM CALL OR NOT?

>> WELL, I THINK THE SYSTEMS CAN ABSOLUTELY DETECT IF IT'S TEXT IF THAT'S HELPFUL, IT HAS TO LISTEN TO SOME OF IT BEFORE IT CAN MAKE THAT DECISION, THOUGH.

AND I'M FINDING MORE AND MORE -- I GET LEGITIMATE CALLS THAT ARE ALSO TEXT TO SPEECH BECAUSE COMPANIES ARE FINDING IT EASIER TO SEND ME MESSAGES AND ALERT ME THAT MY PACKAGE IS THERE, WHATEVER, AND THEY'RE USING TEXT TO SPEECH.

SO, YOU KNOW, I DON'T KNOW, IT MIGHT BE QUESTIONABLE WHETHER OR NOT YOU CAN ACTUALLY DEPLOY THAT BECAUSE IT'S BEING USED FOR GOOD REASONS AS WELL AS BAD ONES.

>> ANOTHER WAY TO LOOK AT THAT, THOUGH, IS EMAIL.

WE HAVE GOOD EMAIL AND BAD EMAIL. WE HAVE SPAM EVERY SINGLE DAY. THAT'S FAKE INFORMATION.

DEPENDING ON THE SERVERS PROVIDERS ARE USING, THERE ARE DIFFERENT WAYS OF HAVING SPAM FELT REALS DEPLOYED EITHER AUTOMATICALLY OR USER-SELECTED FILTERING.

I SEE THE SAME TYPE OF APPROACH CAN BE USED WITH DISINFORMATION OF THIS TYPE AND PROVIDING INDICATORS AND FLAGS AS A WAY TO INFORM WHETHER WE BELIEVE THIS IS REAL OR NOT.

IN SOME CASES, YOU POINTED OUT, YES, I'VE GOTTEN THE AUTO INSURANCE CLAIM THAT THEY WILL BE SHOWING UP BETWEEN THE HOURS OF 8:00 P.M. AND 6:00 P.M. TO DO SOMETHING.
ON THE OTHER HAND, I ALSO HAVE
MY CELL PROVIDER HAS RECENTLY
IMPLEMENTED A FEATURE THAT
ALERTS ME TO POSSIBLE SPAM WHEN
NUMBERS ARE COMING IN.
>> SPINAL LIKELY?
AM LIKELY, YEAH.
I LOVE THAT.
I HAVE A CHOICE.
DO I ANSWER THE CALL AND PLAY
WITH THE ROBOVOICE?
OR DO I LET IT GO TO VOICEMAIL,
THEY'LL LEAVE ME A VOICEMAIL,
MAYBE, IF IT'S IMPORTANT, OR IT
WILL DROP.
GIVE THE CONSUMER SOME KIND OF
EDUCATION AND OPTION, I THINK IS
ONE WAY TO GO.
>> WE HEARD, YOU KNOW, SOME OF
THE EXAMPLES EARLIER ABOUT THE
JOE ROGEN RECORDINGS, FOR
INSTANCE, YOU KNOW, THAT I
LISTENED TO YESTERDAY AND I GOT
WRONG.
I -- IN FACT, I NOT ONLY GOT
THEM WRONG, I WAS CONFIDENT I
WAS RIGHT WHEN I MADE THE GUESS
AND I WAS COMPLETELY WRONG.
THE TECHNOLOGY CLEARLY EXISTS,
WHAT ARE THE ODDS -- OR IS IT
POSSIBLE THAT CONSUMERS COULD
NOW BE RECEIVING CALLS FROM
PEOPLE USING EFFECTIVELY CLONED
VOICES AND THE VICTIMS OF A
GRANDPARENT SCAM OR SOMETHING
>> LIKE TODAY.
ABSOLUTELY.
LOT OF THESE CALLS COME
FROM PRE-RECORDED SCRIPTS
ANYWAY, BARRIER TO ENTRY.
>> RIGHT.
I WILL SAY THEY ARE -- THE
CURRENT TTS TECHNOLOGY MAY NOT
HAVE A LEVEL OF CONVERSATION.
SO IF PRE-RECORDED, THAT CAN BE
MADE CONVINCING, BUT WHEN YOU
TALK WITH THEM, THEY CANNOT RUN
AS REAL TIME AS -- AS FAST AS
REAL TIME.
THAT'S THE CURRENT PROBLEM.
>> WHERE DO YOU THINK THE
TECHNOLOGY TO IDENTIFY VOICE
CLONES AND FAKE VOICES WILL BE
IN FIVE YEARS?
IF THIS TECHNOLOGY IS DEVELOPING
AS FAST AS IT SOUNDS LIKE AND
IT'S GETTING BETTER AND BETTER
AND EVERY SIX MONTHS OR A YEAR
IT'S GOING TO BE MORE EFFECTIVE
AND HARDER TO DISTINGUISH, IF
YOUR PHONE IS RINGING IN FIVE
YEARS AND IT SOUNDS LIKE YOUR
GRANDMOTHER ON THE PHONE, IS IT
LIKELY THAT THERE'S GOING TO BE
SOMETHING THAT YOU CAN IMPLEMENT
EITHER ON YOUR PHONE OR AT THE
NETWORK LEVEL OR SOMEWHERE THAT
IS GOING TO TELL YOU WITH SOME
DEGREE OF CONFIDENCE WHETHER
THAT IS A CLONED VOICE OR A REAL
HUMAN VOICE?
>> WELL, IN FIVE YEARS, YOU WILL
BE COMING DOWN TO THE END OF THE
SEMANTIC FORENSICS PROGRAM, AND,
BY THAT TIME, WE'LL DEFINITELY
HAVE TRANSITIONABLE CAPABILITIES
JUST AS WE'RE HAVING WITH MEDIA
FORENSICS RIGHT NOW.
I BELIEVE IT'S VERY PROMISING.
I'M EXCITED IN THE REACHES THAT
THE RESEARCH TEAMS ARE DOING ON
THE MEDIA FORENSICS SIDE AND
JUST THE SCOPE AND BREADTH THAT
WE ARE GOING AFTER ON THE
SEMANTIC FORENSICS, I'M REALLY
EXCITED TO SEE WHAT THE NEXT
FOUR AND A HALF YEARS HOLD ON
THAT PROGRAM.
>> WHAT ABOUT YOU, PROFESSOR
TRAYNOR, JOHN, DO YOU HAVE ANY
THOUGHTS ON WHAT WE'RE GOING TO
SEE IN THE NEXT FIVE YEARS?
I THINK CERTAINLY ADVERSARIES AREN'T GOING TO GET ANY WORSE. SO WE'LL SEE THAT SOPHISTICATION CONTINUE. ULTIMATELY, IT WILL BE A COMBINATION OF TECHNIQUES AND CONTEXTINGS THAT WILL GET US THERE. WE HAVE THE SAME CONVERSATION. THE DETAILS ARE DIFFERENT. IF WE COULD WALK AWAY WITH A PIECE OF ADVICE, IF SOMEBODY CALLS YOU URGENTLY AND YOU THINK IT'S IMPORTANT, HANG UP AND CALL THEM BACK, UNLESS IT'S A STATE ACTOR WHO CAN REROUTE PHONE CALLS OR A VERY, VERY SOPHISTICATED HACKING GROUP, CHANCES ARE THAT'S THE BEST WAY NOW TO FIGURE OUT IF YOU WERE TALKING TO WHO YOU THOUGHT YOU WERE.

MY KIDS AND I HAVE SAFETY WORDS. IF I GET AN URGENT CALL, AND THIS HAPPENED WITH MY SON, I GOT AN URGENT CALL, YOU KNOW, AND I ASKED HIM A QUESTION THAT I KNEW HE WOULD ONLY HAVE THE ANSWER TO, AND IT WAS SPUR OF THE MOMENT, AND HE ANSWERED IT AND HE SAID, DAD, WHAT WOULD YOU DO IF I DIDN'T ANSWER THAT QUESTION RIGHT? I SAID, I WOULD TURN ON THE LOCATOR AND COME GET WHOEVER HAD YOUR PHONE.

( LAUGHTER )

YEAH, I THINK THAT'S -- SO WE HAVE BEEN TALKING ABOUT HOW IT'S FAKE. THE OTHER SIDE IS AUTHENTICATION, WHAT IS REAL. SO YOU CAN DO SOMETHING, AS YOU CAN IMAGINE, FOR ALL THE REAL VOICES, WE CAN TRACK SOME SPHESK
FEATURES AND WHEN THERE'S NEVER A VOICE COMING IN, ASSUMING TO BE THAT IDENTITY, WE COMPARE THAT FEATURE. THIS IS TRADITIONAL BYO METRIC FRAMEWORK FOR AUTHENTICATION. SO I STRONGLY AGREE WITH JOHN THAT THE SOLUTION WILL NOT COME BY ONE METHOD OR NOT EVEN BY JUST DETECTION. IT SHOULD BE CHARACTERIZATION, AUTHENTICATION ALL PUT TOGETHER. SO I THINK BY FIVE YEARS WE'LL REACH AN EQUILIBRIUM WHERE THE CONSUMER WILL ALSO BE SUBJECTCATED. THE MERE NUMBER OF FAKE AWED OWES, BUT THEY ALSO WILL GIVE AN IMMUNE SYSTEM TO THESE THINGS. HUMANS ARE AMAZING TO ADAPT TO THIS KIND OF SITUATIONS. LIKE THINK ABOUT SPAM E-MAILS. AT THE VERY BEGINNING WE WERE VERY AFRAID THEY WERE GOING TO DOMINATE THE E-MAILS, OR THIS RECENT PHOTOSHOP THE IMAGES OR EVEN THE DEEP FAKE VIDEO, PEOPLE ARE BECOMING BETTER AT IDENTIFYING THEM. SO I'M ASSUMING SIMILAR SITUATIONS WILL PLAY OUT FOR FAKE VOICES, ALSO, IN THE COMING YEARS.

>> GREAT, I SEE OUR RED LIGHT IS BLINKING SO WE'VE COME TO THE END OF OUR TIME. PLEASE JOIN ME IN THANKING THIS FANTASTIC PANEL. ( APPLAUSE ) AND I'M GOING TO INTRODUCE LAURA, THE ASSOCIATE DIRECTOR IN F.T.C.'S DIVISION OF LITIGATION TECHNOLOGY AND ANALYSIS TO GIVE A FEW BRIEF CLOSING REMARKS.

>> THANK YOU, WILL.
MY COLLEAGUES LOIS GREISMAN PLANNED TO GIVE CLOSING REMARKS TODAY AND I THINK IT'S SOMEWHAT APROPOS THAT SHE LOST HER DAY THE DAY BEFORE HER VOICE CLONING TECHNOLOGY WORKSHOP, BUT FORTUNATELY IT'S JUST LARYNGITIS AND I WILL NOT BE USING ANY TECHNOLOGY SOUND LIKE HER. WHENEVER THERE'S CUTTING EDGE TECHNOLOGY, I TEND TO MAKE A SILLY REFERENCE TO 1970s "STAR TREK." MY STAFF, HOWEVER, REMINDED ME THAT, FOR THIS, YOU CAN GO A LITTLE BIT FURTHER BACK IN TIME. GO ALL THE WAY BACK TO THE ODYSSEY. HOMER WRITES HELEN NOW THWARTED THE INVASION OF TROY BY BECKONING THE SOLDIERS HIDDEN INSIDE THE TROJAN HORSE. SHE BECKONED THE SOLDIERS TO COME OUT MIMICKING THE VOICE OF THE SOLDIERS' WIVES. ODYSSEUS RECOGNIZED THAT THE VOICES WERE BEING HIM BINGED AND KEPT THE SOLDIERS FROM EXITING THE HORSE. SO FAST FORWARD A FEW YEARS, AND HERE WE ARE TODAY, AND AS OUR PANELISTS AND SPEAKERS HAVE MENTIONED, PEOPLE HAVE BEEN MIMICKING VOICES FOR YEARS, BUT JUST IN THE LAST FEW YEARS, TECHNOLOGY HAS ADVANCED TO THE POINT WHERE WE CAN CLONE VOICES AT SCALE USING A VERY SMALL AUDIO SAMPLE. I APPRECIATE OUR FLANNELLISTS GIVING US REAL, CONCRETE EXAMPLES OF THE BENEFITS AND THE KERNS OF THE TECHNOLOGY. WE HEARD A VERY POWERFUL EXAMPLE OF THE USE OF TECHNOLOGY TO HELP PEOPLE WHO HAVE LOST THE ABILITY
TO SPEAKERS COMMUNICATE WITH FAMILY MEMBERS, INCLUDING OUR FOUR-LEGGED FAMILY MEMBERS AND, AS WELL, USING THESE TYPES OF TECHNOLOGIES TO HELP PEOPLE WHO HAVE NEVER BEEN ABLE TO SPEAK AND, ALSO, POTENTIAL FOR USING TECHNOLOGIES LIKE THIS TO INCREASE THE DIVERSITY OF VOICES THAT WE HEAR IN A VARIETY OF SITUATIONS.

BUT THE CONCERNS ALSO ARE REAL.
THE IMPACT FOR EXAMPLE ON VOICE ARTISTS WHO, IF THEIR VOICE IS USED, WILL THEY BE COMPENSATED? IS IT WITH THEIR CONSENT?
AND THEN, OF COURSE, THE USE OR POTENTIAL USE BY CRIMINALS, WHETHER IT'S FOR HARASSMENT OR FRAUD.
CRIMES DEPEND ON COMMUNICATION AND THE USE OF THESE TECHNOLOGIES, ESPECIALLY COMBINED WITH VOICE COMPRESSION PHONE CALLS, CAN MAKE IT MORE CONVINCING, MAKE A CRIMINAL SOUND MORE CONVINCING.
THIS COULD JUST RESULT IN A GREATER AMOUNT OF CONSUMER INJURE.
SO THE ETHICAL CONSIDERATIONS OF VOICE CLONING TECHNOLOGIES ARE PENNILESS, TALKING ABOUT THE IMPORTANCE OF BUILDING IN ETHICAL PROCESSES DURING TECHNOLOGY DEVELOPMENT.
AND WE HEARD EXAMPLES OF THAT HAPPENING TODAY.
ALSO, OUR PANELISTS TALKED ABOUT THE IMPORTANCE OF INVOLVING USERS, HAVING COMPANIES TAKE END USERS' VIEWS AND VALUES INTO ACCOUNT, INVOLVING THEM IN THE DISCUSSION, AND THE NEED FOR ALL PLAYERS -- CIVIL SOCIETY, PRIVATE SECTOR, GOVERNMENT -- TO
BE INVOLVED IN THE DISCUSSIONS
OF THE ETHICAL USES OF
TECHNOLOGY.
FINALLY, OUR PANEL WHICH WE JUST
HEARD FROM, I WON'T TRY TO
EXPLAIN THE TECHNOLOGY THAT YOU
DESCRIBED, BUT THE TECHNOLOGIES
THAT ARE BEING DEVELOPED TO HELP
DETECT CLONED OR A.I.
SYNTHESIZED VOICES.
THE IMPORTANT PART, OUR PANELS
TALKED ANT WHAT I EXPECT -- AND
THIS HAS BEEN THE CASE OF OTHER
EMERGING TECHNOLOGIES -- IS
THERE CAN BE A CAT AND MOUSE
GAME.
AS TECHNOLOGY GETS BETTER SO DO
CLONING TECHNOLOGIES AND SO
FORTH.
BUT WHAT I HEARD AT THE END IS
COMBINE AGO NUMBER OF FACTORS
INCLUDING DETECTION TECHNOLOGIES
TO HELP EDUCATE CONSUMERS OR HOW
THEY MIGHT DETECT CLONED VOICES.
SO, ALL IN ALL, I WOULD LIKE TO
THANK ALL OF OUR PANELISTS
TODAY, ESPECIALLY PATRICK
TRAYNOR FOR LEADING OFF OUR
SESSION.
WE APPRECIATE THE TIME AND YOUR
PARTICIPATION IN THIS EVENT.
THANK YOU TO THE F.T.C. STAFF,
MOST IMPORTANTLY, INCLUDING OUR
EVENTS PLANNING STAFF, OUR MEDIA
TEAM, OUR PARALEGALS, FOR
EVERYONE WHO MADE THIS EVENT
POSSIBLE.
IN THE COMING WEEKS OF VIDEO AND
A ROUGH TRANSCRIPT OF THE
WORKSHOP WILL BE AVAILABLE AT
F.T.C..GOV.
IF YOU DIDN'T GET ENOUGH TODAY,
YOU CAN REVISIT IT AND SEE IF
YOU CAN GET THE EXAMPLE CORRECT.
THANK YOU ALL FOR COMING.
( APPLAUSE )