

TED演讲者: Supasorn Suwajanakorn | Supasorn Suwajanakorn

演讲标题: Fake videos of real people -- and how to spot them | 真人的假视频以及如何识别他们

内容概要: Do you think you're good at spotting fake videos, where famous people say things they've never said in real life? See how they're made in this astonishing talk and tech demo. Computer scientist Supasorn Suwajanakorn shows how, as a grad student, he used AI and 3D modeling to create photorealistic fake videos of people synced to audio. Learn more about both the ethical implications and the creative possibilities of this tech -- and the steps being taken to fight against its misuse.

你觉得你擅长发现假视频吗, 当名人们并没有真正说过这些话的时候? 这个演讲和技术演示让我们了解到这是如何做到的。计算机科学家 Supasorn Suwajanakorn 为我们展示了, 如何使用人工智能和3D建模并与音频同步来创造假视频。了解更多关于这个技术的伦理问题和这个技术的可能性, 以及我们应该采取的措施来对抗该技术的错误使用。

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Look at these images.

看看这些图像。[00:12]

Now, tell me which Obama here is real.

现在,告诉我哪个是真的奥巴马。[00:13]

(Video) Barack Obama: To help families **refinance** their homes, to invest in things like **high-tech manufacturing**, clean energy and the infrastructure that creates good new jobs.

巴拉克·奥巴马:帮助家庭对他们的房屋重做贷款,投资高科技制造业,清洁能源和带来良好就业机会的基础设施。[00:16]

Supasorn Suwajanakorn: Anyone?

有人知道吗? [00:26]

The answer is none of them.

答案是:都不是。[00:27]

(Laughter) None of these is actually real.

(笑声) 这些都不是真的。[00:29]

So let me tell you how we got here.

那让我来告诉你们是怎么回事。[00:32]

My inspiration for this work was a project meant to **preserve** our last chance for learning about the **Holocaust** from the survivors.

我这个工作的灵感来自于一个试图保存我们从幸存者那里了解到的关于大屠杀的项目。[00:35]

It's called New **Dimensions** in **Testimony**, and it allows you to have interactive conversations with a **hologram** of a real Holocaust survivor.

这个项目叫做证词新维度 (New Dimensions in Testimony), 它可以让你与真实大屠杀幸存者的全息图进行互动对话。[00:44]

(Video) Man: How did you survive the Holocaust?

你是怎么在大屠杀中幸存下来的? [00:53]

refinance: vt.再供...资金;再为...筹钱 **high-tech**: adj.高科技的,高技术的;仿真技术的/n.高科技 **manufacturing**: adj.制造的;制造业的/n.制造业;工业/v.制造;生产(manufacture的ing形式) **preserve**: vt.保存;保护;维持;腌;禁猎/n.保护区;禁猎地;加工成的食品 **Holocaust**: n.大屠杀;毁灭 **Dimensions**: n.规模,大小 **Testimony**: n.[法]证词,证言;证据 **hologram**: n.[激光]全息图;全息摄影,全息照相

(Video) Hologram: How did I survive?

我怎么幸存下来? [00:55]

I survived, I believe, because **providence** watched over me.

我幸存下来,我相信,是因为上帝眷顾我。[00:57]

SS: Turns out these answers were **prerecorded** in a studio.

原来这些答案是预先在工作室录制的。[01:05]

Yet the effect is **astounding**.

但效果令人吃惊。[01:08]

You feel so connected to his story and to him as a person.

你会对他的故事,他这个人感同身受。[01:11]

I think there's something special about human interaction that makes it much more profound and personal than what books or lectures or movies could ever teach us.

我想人类互动的特别之处 让它比图书,演讲或电影告诉我们的 要更加深刻和真实。[01:15]

So I saw this and began to wonder, can we create a model like this for anyone?

所以我就开始想,我们能不能为每个人做个模型? [01:28]

A model that looks, talks and acts just like them?

这个模型的样子,谈话和举止就跟真人无异。[01:33]

So I **set out** to see if this could be done and eventually came up with a new solution that can build a model of a person using nothing but these: existing photos and videos of a person.

于是我开始探索这个能不能搞定,并最终找到了一个新的解决方案,只需使用下面这些东西就能构建人的模型: 个人现存的照片和视频。[01:37]

If you can **leverage** this kind of passive information, just photos and video that are out there, that's the key to **scaling** to anyone.

如果你能利用这种被动信息,只需公开的照片和视频,这是扩展到其他人的关键。[01:48]

providence: n.天意; 深谋远虑 **prerecorded**: vt.事先录音 **astounding**: adj.令人震惊的;令人惊骇的 **set out**: 出发;开始; 陈述;陈列 **leverage**: n.手段,影响力;杠杆作用;杠杆效率/v.利用;举债经营 **scaling**: n.缩放比例;刮治术,[口腔]刮牙术;鳞片排列/v.剥落;刮鳞;生水垢(scale的ing形式)

By the way, here's Richard Feynman, who **in addition to** being a Nobel Prize winner in physics was also known as a **legendary** teacher.

顺便说一句,这是理查德·费曼,他除了是诺贝尔物理学奖得主也是位传奇教师。[01:55]

Wouldn't it be great if we could bring him back to give his lectures and inspire millions of kids, perhaps not just in

这岂不是很棒? 如果能够把他带回来 讲课并激励成千上万的小孩,用英语或者其他任何语言?

English but in any language?	[02:04]
Or if you could ask our grandparents for advice and hear those comforting words even if they're no longer with us?	或者你也可以征求祖父母的意见, 听听那些让人宽慰的言语, 即使他们已经离开我们了。 [02:14]
Or maybe using this tool, book authors, alive or not, could read aloud all of their books for anyone interested.	或者使用这个工具, 图书的作者, 不管是活着的还是去世的, 可以为任何有兴趣的人朗读他们的书本。 [02:21]
The creative possibilities here are endless, and to me, that's very exciting.	这里的创意可能是无限的, 对我而言, 这非常让人兴奋。 [02:29]
And here's how it's working so far.	这是目前它的工作原理。 [02:34]
First, we introduce a new technique that can reconstruct a high-detailed 3D face model from any image without ever 3D-scanning the person.	首先我们引入一种新的技术 可以从任何图像中 重建一个高细节的3D人脸模型, 而且无需对真人进行3D扫描。 [02:36]
And here's the same output model from different views.	这是不同视角下的同一输出模型。 [02:45]
in addition to: 除...之外 legendary: adj. 传说的, 传奇的/n. 传说集; 圣徒传 外祖父母 aloud: adv. 大声地; 出声地 reconstruct: vt. 重建; 改造; 修复; 重现	grandparents: n. 祖父母 (grandparent的复数);
This also works on videos, by running the same algorithm on each video frame and generating a moving 3D model.	这也可以应用于视频, 通过对每一幅视频 使用同样的算法 产生移动的3D模型。 [02:49]
And here's the same output model from different angles.	这是不同视角下的同一输出模型。 [02:57]
It turns out this problem is very challenging, but the key trick is that we are going to analyze a large photo collection of the person beforehand .	这些问题富有挑战性, 但关键技巧在于我们需要提前 分析一个人的大量照片集。 [03:01]
For George W. Bush, we can just search on Google, and from that, we are able to build an average model, an iterative, refined model to recover the expression in fine details, like creases and wrinkles .	对乔治·沃克·布什, 我们只需要搜索谷歌, 这样, 我们就能建立一个平均模型, 一个迭代, 精炼的模型来恢复表达的细, 比如折痕和皱纹。 [03:10]
What's fascinating about this is that the photo collection can come from your typical photos.	迷人的是 照片集可以来自你的特定照片。 [03:23]
It doesn't really matter what expression you're making or where you took those photos.	你做什么表情或者你在哪里拍照 并不那么关键。 [03:28]
What matters is that there are a lot of them.	关键的是数量要足够多。 [03:32]
And we are still missing color here, so next, we develop a new blending technique that improves upon a single averaging method and produces sharp facial textures and colors.	这里我们仍然缺少肤色, 所以下一步, 我们开发了一种新的混合技术 改善了平均模型, 并产生尖锐的面部纹理和肤色。 [03:34]
beforehand: adv. 事先; 预先/adj. 提前; 预先准备好的 iterative: adj. [数] 迭代的; 重复的, 反复的/n. 反复体 refined: adj. [油] [化工] [治] 精炼的; 精确的; 微妙的; 有教养的 creases: n. [服装] 皱纹; 褶皱; 折缝; 球门区 (crease的复数)/v. 使起折痕; 擦伤; 变皱 (crease的三单形式) wrinkles: n. 皱纹; 皱褶 (wrinkle的复数形式)/v. 起皱 (wrinkle的第三人称单数形式) fascinating: adj. 迷人的; 吸引人的; 使人神魂颠倒的/v. 使...着迷; 使...陶醉 (fascinate的ing形式) blending: n. 混合; 调配; 混和物/adj. 混合的/v. 混合; 协调 (blend的ing形式) averaging: n. 求平均值; 拉平价格; 为取得更高的平均价格而买进 (卖出)/adj. 平均的/v. 平均 (average的ing形式) facial: adj. 面部的, 表面的; 脸的, 面部用的/n. 美容, 美颜; 脸部按摩 textures: n. 纹理; 材质 (texture的复数)/v. 使具有某种结构 (texture的三单形式)	
And this can be done for any expression.	这可以用于做任何表情。 [03:45]
Now we have a control of a model of a person, and the way it's controlled now is by a sequence of static photos.	现在我们可以 对一个人的模型进行控制, 它现在被控制的方式是一系列静态的照片。 [03:49]
Notice how the wrinkles come and go, depending on the expression.	注意皱纹是如何产生和消失的, 这取决于你的表情。 [03:55]
We can also use a video to drive the model.	我们也可以使用视频来驱动模型。 [03:59]
(Video) Daniel Craig: Right, but somehow, we've managed to attract some more amazing people.	丹尼尔·克雷格: 没错, 但不管怎样, 我们能够吸引到更多优秀的人才。 [04:02]
SS: And here's another fun demo.	这是另一个有趣的演示。 [04:09]
So what you see here are controllable models of people I built from their internet photos.	所以你们看到的是 我使用人们的互联网图像 建立的个人控制模型。 [04:11]
Now, if you transfer the motion from the input video, we can actually drive the entire party.	现在, 如果你从视频中传递表情动作, 我们可以让整个派对动起来。 [04:16]
George W. Bush: It's a difficult bill to pass, because there's a lot of moving parts, and the legislative processes can be ugly.	布什: 这是个难以通过的法案, 因为有太多可供商榷的部分, 立法过程可能让人崩溃。 [04:21]
(Applause) SS: So coming back a little bit, our ultimate goal, rather, is to capture their mannerisms or the unique way each of these people talks and smiles.	(鼓掌) 那么回到正题, 我们的最终目标, 不如说是捕捉他们的言谈举止, 或者每一个人交谈或微笑的独特之处。 [04:31]
controllable: adj. 可控制的; 可管理的; 能操纵的 legislative: adj. 立法的; 有立法权的/n. 立法权; 立法机构 ultimate: adj. 最终的; 极限的; 根本的/n. 终极; 根本; 基本原则 mannerisms: n. 特殊习惯; 矫揉造作; 怪癖	
So to do that, can we actually teach the computer to imitate the way someone talks by only showing it video footage of	所以这样, 我们能不能只向电脑展示这个人的录像 就能教会电脑 去模仿人们谈话的方式? [04:40]

the person?

And what I did exactly was, I let a computer watch 14 hours of pure Barack Obama giving addresses.

And here's what we can produce given only his audio.

(Video) BO: The results are clear.

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America's businesses have created 14.5 million new jobs over 75 straight months.

SS: So what's being **synthesized** here is only the mouth region, and here's how we do it.

Our pipeline uses a **neural** network to convert and input audio into these mouth points.

(Video) BO: We get it through our job or through **Medicare** or **Medicaid**.

SS: Then we synthesize the texture, enhance details and teeth, and blend it into the head and background from a source video.

(Video) BO: Women can get free **checkups**, and you can't get charged more just for being a woman.

footage: n.英尺长度;连续镜头;以尺计算长度 **synthesized**: adj.合成的;综合的/v.合成(synthesize的过去分词);综合 **neural**: adj.神经的;神经系统的;背的;神经中枢的 **Medicare**: n.(美,加)医疗保险(等于medicare) **Medicaid**: n.(美)医疗补助计划 **checkups**: n.审查,检查;健康检查

Young people can **stay on** a parent's plan until they turn 26.

SS: I think these results seem very realistic and **intriguing**, but at the same time **frightening**, even to me.

Our goal was to build an accurate model of a person, not to **misrepresent** them.

But one thing that concerns me is its potential for **misuse**.

People have been thinking about this problem for a long time, since the days when Photoshop first hit the market.

As a researcher, I'm also working on **countermeasure** technology, and I'm part of an ongoing effort at AI Foundation, which uses a combination of machine learning and human **moderators** to detect fake images and videos, fighting against my own work.

And one of the tools we plan to release is called Reality **Defender**, which is a web-browser **plug-in** that can flag **potentially** fake content **automatically**, right in the **browser**.

stay on: 继续停留 **intriguing**: adj.有趣的;迷人的/v.引起...的兴趣;策划阴谋;私通(intrigue的ing形式) **frightening**: adj.令人恐惧的;引起突然惊恐的 **misrepresent**: vt.歪曲,误传;不适当地代表/vi.虚伪陈述;歪曲报道 **misuse**: vt.滥用;误用;虐待/n.滥用;误用;虐待 **countermeasure**: n.对策;反措施;反抗手段 **moderators**: n.主持人,版主 **Defender**: n.防卫者,守卫者;辩护者;拥护者;卫冕者 **plug-in**: n.插件程序,插件法 **potentially**: adv.可能地,潜在地 **automatically**: adv.自动地;机械地;无意识地/adj.不经思索的 **browser**: n.[计]浏览器;吃嫩叶的动物;浏览书本的人

(Applause) Despite all this, though, fake videos could do a lot of damage, even before anyone has a chance to verify, so it's very important that we make everyone **aware** of what's currently possible so we can have the right assumption and be **critical** about what we see.

There's still a long way to go before we can fully model individual people and before we can ensure the safety of this technology.

But I'm excited and hopeful, because if we use it right and carefully, this tool can allow any individual's positive impact on the world to be **massively scaled** and really help shape our future the way we want it to be.

Thank you.

(Applause)

aware: adj.意识到的;知道的;有...方面知识的;懂世故的/ **critical**: adj.鉴定的;[核]临界的;批评的;爱挑剔的;危险的;决定性的;评论的 **massively**: adv.大量地;沉重地;庄严地 **scaled**: adj.有鳞的;(房屋)栉比鳞次的;已去了鳞的/v.刮去鳞片;生鳞片(scale的过去式和过去分词)

而我做的事情是,我让电脑看了14个小时的奥巴马演讲。[04:48]

这是我们只通过他的音频生产出来的内容。[04:55]

结果非常明显。[04:58]

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在过去75个月中,美国企业已经创造了1450万新的工作机会。[05:00]

所以这里合成的只是嘴巴部分,这是我们做的方法。[05:07]

我们的处理系统使用神经网络来转换和输入音频到这些嘴巴的位置。[05:12]

我们通过我们的工作或者医疗保险或补助来实现这一目标。[05:18]

然后我们合成纹理,增强细节和牙齿,并将其与源视频中的头部和背景混合在一起。[05:22]

女性可以获得免费的检查,你不会因为是女性而需要支付更高的费用。[05:29]

年轻人可以在父母计划中呆到26岁。[05:34]

我觉得这些结果看起来非常真实和有趣,但同时,也让我担忧,即便是我。[05:39]

我们的目标是构建人的精准模型,而非歪曲他们。[05:45]

但让我担忧的是它被错误使用的可能。[05:49]

人们思考这个问题很长时间了,从Photoshop进入市场那天就开始了。[05:53]

作为一名研究人员,我也在研究对抗技术,我是人工智能基金会持续努力的一份子,它结合了机器学习和人工模型来识别假图像和视频,与我们自己的工作做斗争。[05:59]

我们打算发布的一个工具叫做真相卫士,是个浏览器插件,可以用来自动标记潜在假内容,在浏览器中就可以使用。[06:14]

(掌声) 此外,假视频可以带来很大危害,甚至在人们有机会验证它之前,所以让大家意识到这可能是什么非常重要,这样我们才能得到正确的推断,并对看到的保持谨慎。[06:24]

在个人完全建模以及确保技术的安全性方面,仍有很长的路要走。[06:44]

但我兴奋且充满希望,因为如果我们正确地使用它,这个工具可以让每个人对世界积极的影响得到大规模的普及并真正帮助塑造我们想要的未来。[06:52]

谢谢。[07:07]

(掌声) [07:08]

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