Group members' names: Date: 220928

Quoting, Summarizing & Paraphrasing Practice

Instructions

1. *Make a Google doc copy of this file.*
2. *Gather the google email addresses of your group members and Prof. Powell (npowell@g.postech.edu) and give them edit access to your copy of this doc. Using the blue share button at the top right hand side of the window.* [— ᐱ]
3. *Have everyone write their name at the top of this document*
4. *Follow the directions in the remaining sections*

Article Information	
Title	Researchers use facial quirks to unmask 'deepfakes'
Author (s)	Kara Manke
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Step 1: Divide and Skim

Select which section you want to read and create a subheading for your section (using a comment)

Original Text

After watching hours of video footage of former President Barack Obama delivering his weekly address, Shruti Agarwal began to notice a few quirks about the way Obama speaks. "Every time he says 'Hi, everybody,' he moves his head up to the left or the right, and then he purses his lips," said Agarwal, a computer science graduate student at UC Berkeley.

Agarwal and her thesis advisor Hany Farid, an incoming professor in the Department of Electrical Engineering and Computer Science and in the School of Information at UC Berkeley, are racing to develop digital forensics tools that can unmask "deepfakes," hyper-realistic AI-generated videos of people doing or saying things they never did or said.

Seeing these patterns in the real Obama's speech gave Agarwal an idea. "I realized that there is one thing common among all these deepfakes, and that is that they tend to change the way a person talks," Agarwal said. Agarwal's insight led her and Farid to create the latest weapon in the war against deepfakes: a new forensic approach that can use the subtle characteristics of how a person speaks, such as Obama's distinct head nods and lip purses, to recognize whether a new video of that individual is real or a fake.

Their technique, which Agarwal presented this week at the Computer Vision and Pattern Recognition conference in Long Beach, CA, could be used to help journalists, policy makers, and the public stay one step ahead of bogus videos of political or economic leaders that could be used to swing an election, destabilize a financial market, or even incite civil unrest and violence.

"Imagine a world now, where not just the news that you read may or may not be real — that's the world we've been living in for the last two years, since the 2016 elections — but where the images and the videos that you see may or may not be real," said Farid, who begins his tenure at UC Berkeley on July 1. "It is not just about these latest advances in creating fake images and video. It is the injection of these techniques into an ecosystem that is already promoting fake news, sensational news and conspiracy theories."

The new technique works because all three of the most common deepfake techniques — known as "lip-sync," "face swap," and "puppet-master," — involve combining audio and video from one source with an image from another source, creating a disconnect that may be uncovered by a keen viewer — or a sophisticated computer model.

Using the "face swap" technique, for example, one could create a deepfake of Donald Trump by superimposing Trump's face onto a video of Alec Baldwin doing an

메모 포함[1]: Song Hyoseok

메모 포함[2]: Dahee Wang

impersonation of Trump, so that it is almost as if Baldwin is wearing a skin-tight Trump mask. But Baldwin's facial expressions will still show through the mask, Agarwal said. "The new image that is created will have the expressions and facial behavior of Alec Baldwin, but the face of Trump," Agarwal said.

Likewise, in a "lip-sync" deepfake, AI algorithms take an existing video of a person talking, and alter the lip movements in the video to match that of a new audio, where the audio may be an older speech taken out of context, an impersonator speaking, or synthesized speech. Last year, actor and director Jordan Peele used this technique to create a viral video of Obama saying inflammatory things about president Trump. But in these videos, only the lip movements are changed, so the expressions on the rest of the face may no longer match the words being spoken.

To test the idea, Agarwal and Farid gathered video footage of five major political figures – Hillary Clinton, Barack Obama, Bernie Sanders, Donald Trump and Elizabeth Warren – and ran them through the open-source facial behavior analysis toolkit OpenFace2, which picked out facial tics like raised brows, nose wrinkles, jaw drops and pressed lips.

They then used the outputs to create what the team calls "soft biometric" models, which correlate facial expressions and head movements for each political leader. They found each leader had a distinct way of speaking and, when they used these models to analyze real videos and deepfakes created by their collaborators at the University of Southern California, they found the models could accurately tell the real from the fake between 92 and 96 percent of the time, depending on the leader and length of the video.

"The basic idea is we can build these soft biometric models of various world leaders, such as 2020 presidential candidates, and then as the videos start to break, for example, we can analyze them and try to determine if we think they are real or not," Farid said. Unlike some digital forensics techniques, which identify fakes by spotting image artifacts left behind during the fabrication process, the new method can still recognize fakes that have been altered through simple digital processing like resizing or compressing.

But it's not foolproof. The technique works well when applied to political figures giving speeches and formal addresses because they tend to stick to well-rehearsed behaviors in these settings. But it might not work as well for videos of these people in other settings: for example, Obama may not give his same characteristic head nod when greeting his buddies. Deepfake creators could also become savvy to these speech patterns and learn to incorporate them into their videos of world leaders, the researchers said. Agarwal says she hopes the new approach will help buy a little time in the ever-evolving race to spot deepfakes. "We are just trying to gain a little upper-hand in this cat and mouse game of detecting and creating new deepfakes," Agarwal said.

메모 포함[3]: 김희서

메모 포함[4]: 정치인들의 얼굴 표정, 머리 움직임, 말투와 같은 특정한 행동이 실제 비디오와 deepfake 를 구분할 때 사용.

메모 포함[5]: 정치인과 같이 규격화 된 행동을 하는 경우는 정확도가 높으나, 그렇지 않은 경우는 한계.

On the left, Saturday Night Live star Kate McKinnon impersonates Elizabeth Warren during a skit, and on the right, face swap deepfake technology has been used to superimpose Warren's face onto that of McKinnon. (UC Berkeley photo by Stephen McNally)

Step 2: Read and Highlight ↑↑↑

In your section above, underline 2-3 important points, and highlight at least one useful sentence to use as a paraphrased quote. Reread them till you think you understand them.

Step 3: Pulling out & and paraphrasing quotes

Each member should add below one or two of the quotable sentences they chose in step 2.

<section 1>
- Agarwal and her thesis advisor Hany Farid, an incoming professor in the Department of Electrical Engineering and Computer Science and in the School of Information at UC Berkeley, are racing to develop digital forensics tools that can unmask "deepfakes," hyper-realistic AI-generated videos of people doing or saying things they never did or said.
    - Paraphrased version: Agarwal and Hany Farid are developing a digital forensics tool that can uncover "deepfakes". A deepfake is a surreal, AI-generated video in which people do or say something they've never done or said before.

- Their technique, which Agarwal presented this week at the Computer Vision and Pattern Recognition conference in Long Beach, CA, could be used to help journalists, policy makers, and the public stay one step ahead of bogus videos of political or economic leaders that could be used to swing an election, destabilize a financial market, or even incite civil unrest and violence.
    - Paraphrased version: Agarwal's skills can be used to help the citizen identify fake videos. Fake videos can be used to shake up elections, make an unstable economy, or cause public anxiety and violence.

<section 2>
- It is not just about these latest advances in creating fake images and video. It is the injection of these techniques into an ecosystem that is already promoting fake news, sensational news and conspiracy theories."
    - Paraphrased version: What really matters in the advances of the deep-fake related technologies are their rapid and invasive effects on the existent flood of fake, exaggerated, and conspiratorial news.

- The new technique works because all three of the most common deepfake techniques — known as "lip-sync," "face swap," and "puppet-master," — involve combining audio and video from one source with an image from another source, creating a disconnect that may be uncovered by a keen viewer — or a sophisticated computer model
    - Paraphrased version: Deepfake technologies connect the various visual and sound information from different sources in a very natural way using three representative approaches — "lip-sync", "face swap", and "puppet-master" — so that the incongruity of created videos can be barely noticed only by the incisive watchers or well-designed algorithms.

<section 3>
- Unlike some digital forensics techniques, which identify fakes by spotting image artifacts left behind during the fabrication process, the new method can still

recognize fakes that have been altered through simple digital processing like resizing or compressing.

- ○ Paraphrased version:
  Unlike other digital forensics techniques, the new method is able to distinguish between true and false. Because of their technical limitations

  => 수정사항 : some conventional digital forensics techniques identify fakes by fabrication process's error like image artifacts, but the new method can distinguish altered fake image using simple digital processing like change of ratio and size.

- The new method works well when applied to political figures giving speeches and formal addresses because they tend to stick to well-rehearsed behaviors in these settings.

  - ○ Paraphrased version:
    For politicians who are prone to predicting behavior or gestures and so on, the new method works well.(has high accuracy.)

    -> The new method has high accuracy when applied to politician's performance, because they tend to stereotyped behavior.

- They then used the outputs to create what the team calls "soft biometric" models, which correlate facial expressions and head movements for each political leader.

  Paraphrased version: researcher created a new method, which is called "soft biometric" models. Input data used by the model are political leader's facial expressions and head movements.

Step 4: Paraphrasing main ideas

As best as you can, without copying the underlined parts, write down paraphrased (in your own words) versions of your section's main points.

Section	Paraphrased main ideas (part 3 quote + important info)
Section 1	

Section 2	What really matters in the advances of the deep-fake related technologies are their rapid and invasive effects on the existent flood of fake, exaggerated, and conspiratorial news.	
	Deepfake technologies connect the various visual and sound information from different sources in a very natural way using three representative approaches — "lip-sync", "face swap", and "puppet-master" — so that the incongruity of created videos can be barely noticed only by the incisive watchers or well-designed algorithms.	
Section 3		
Section 4		

Step 5: Compare & check for missing supporting details

Skim through your section above and confirm that no appropriate points were left out.

Step 6: Check your citation information

Skip this step as it has been done for you on the first page of this document.

Step 7: Write a Summary

Everyone in the group make a copy of this file. Each individual makes a summary using the notes and quotes you all created as a group above. Your summary should include 2 of the paraphrased quotes with a citation. And the whole summary should not be longer than 1-2 paragraphs. (1 paragraph is ideal)

Recently, Fake videos by deepfakes have been flooded. So Agarwal and Hany Farid developing a digital forensics tool that can uncover "deepfakes". A deepfake is a surreal, AI-generated video in which people do or say something they've never done or said before. Then, Researcher created a new method, which is called "soft biometric" models. Input data used by the model are political leader's facial expressions and head movements. It will be a powerful weapon in the war against deepfake creators.

Deepfake is not just a prank(joke) video, but it causes serious social problems. In other words, What really matters in the advances of the deep-fake related technologies there rapid and invasive effects on the existent flood of fake, exaggerated, and conspiratorial news. Specially, the reason why deepfake creators set main target for politicians is because of their predictable and formal behavior figure. So, these characteristics allows famous deepfake technologies to make other video; e.g. lip-sync, face swap, puppet-master. Conversely, in unpredictable situations, it is easy to distinguish whether deepfake video is real or fake. So creators are very focused on capturing characteristics and habit of influencer.