Fake Voices:
The Ethics of Deepfakes

**A Beginner-Level Programming Activity
and Student Discussion on the Social Impact of Synthetic Media**

Teacher Guide

Overview

- Explore synthetic media by creating a smartphone app that generates synthetic speech.
- Explore a variety of AI-generated deepfakes.
- Use this lesson to introduce students to coding, provide a basic understanding of artificial intelligence and machine learning, and prompt questions around the use and abuse of synthetic voices.

## Duration

3 x 50-minute lessons

Target Grades

High School | Grades 9-12 (Advanced middle school students may also be able to take on this unit.)

Objectives

Students will:

- code a simple app that allows them to explore synthetic speech on a phone.
- explain the basics of how AI systems generate deepfakes.
- work in groups to present an argument about the possible impacts of various kinds of deepfakes on society.

Course Resources
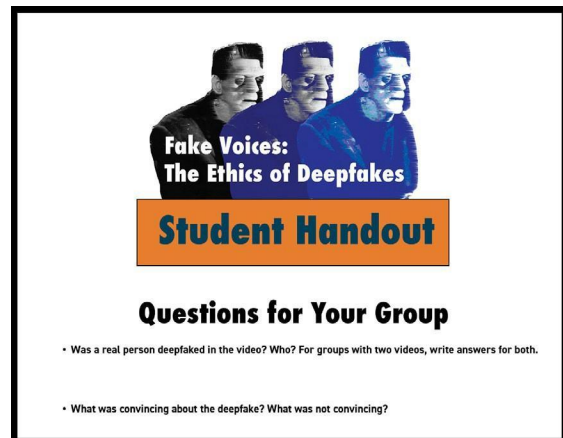
Google Docs: [Teacher Slides](#)   [Student Handouts](#)

Outline

Lesson 1: Make Your Own Fake Voices (50 minutes)

- Students begin discussing deepfake audio.
- They code a beginner-level app that allows them to explore computer-generated speech.
- App testing!

Lesson 2: From Fake Voices to Deepfakes (50 minutes)

- What is the difference between fake voices from a phone and deepfakes from an AI system?
- How are deepfakes created?
- Students explore high-quality deepfake audio and video in five categories (Commerce, Assistive Technology, Pop Music, History, & Crime).

Lesson 3: Deepfake Discussions and Presentations: The Ethics of Deepfakes (50 minutes)

- Student groups discuss deepfakes in their chosen category.
- What are the future social consequences of deepfakes in your category?
- Students compare perspectives across groups.

Targeted Standards

CTSA Standards Grades 9 – 10

3A-IC-24 Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.

CTSA Standards Grades 11 – 12

3B-IC-25 Evaluate computational artifacts to maximize their beneficial effects and minimize harmful effects on society.

3B-IC-27 Predict how computational innovations that have revolutionized aspects of our culture might evolve.

3B-IC-28 Debate laws and regulations that impact the development and use of software.

ISTE Standards for Students

3. Knowledge Constructor d. Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

ISTE Computational Thinking Competencies

1. Computational Thinking e. Recognize how computing and society interact to create opportunities, inequities, responsibilities and threats for individuals and organizations.

Common Core State Standards for English Language Arts

CCSS.ELA-LITERACY.W.6.1 through 11-12.1 Write arguments to support claims with clear reasons and relevant evidence.

CCSS.ELA-LITERACY.WHST.9-10.7/11-12.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Lesson 1: Make Your Own Fake Voices (50 minutes)

Overview

- Students begin discussing deepfake audio.
- They code a beginner-level app that allows them to explore computer-generated speech.
- Use this lesson to introduce students to coding and to generate questions around the use and abuse of synthetic voices.

Objectives

Students will:

- create a mobile application that performs text-to-speech and manipulates audio effects.
- formulate opinions on the use of synthetic voices from a phone.

Preparation

- ☐ Do the coding activity yourself in your classroom space using the **Fake Voices tutorial** in App Inventor:

  http://ai2.appinventor.mit.edu/?locale=en&repo=http://appinventor.mit.edu/yrtoolkit/yr/aiaFiles/Fake_Voices/FakeVoices_Starter.asc

- ☐ Check that the App Inventor platform works on the Wi-Fi network where you will do the lesson. (If you experience problems in a school setting, consult your IT person.)
- ☐ Decide whether resources are available for students to work individually. If student groups make more sense, teams of two (if possible) allow for hands-on engagement with the coding.

Gather materials needed:

- ☐ Phones or tablets (iOS or Android) for each student or group
- ☐ Laptops/Chromebooks for each student or group
- ☐ Wireless internet access
- ☐ Send the link for the Fake Voices tutorial (use the link above) to students by email or share it with the teacher slides electronically.

Activity Steps

Introduce the Topic (5 minutes)

1. **Project the slide that shows an overview of the lesson**, Code your Own Fake Voice (**slide 2**), and briefly discuss agenda.

2. **Start the discussion** by asking your students if they have heard of deepfakes on the Internet and what they know about them. Highlight representative examples of beneficial and harmful deepfakes among student suggestions. You might point out:

   • Deepfakes are video or audio files made by computers that mimic humans.

   • New technologies can have both positive and negative implications when they first come out.

3. **Show the slide "What are Deepfakes?"** (**slide 3**) and launch the short **Jay-Z video** (0:13)

4. **Ask the class:**

   • *In the Jay-Z video, did the deepfake sound like a real person? For those who know the rapper, did it sound like him? Can you identify the text he was reading?*

   • *How did the computers learn to recreate the rapper's voice? Ask students for their ideas.* If students struggle to answer, suggest that computers learn by analyzing many examples of images, sounds, or words.

   • *What do you think the term artificial intelligence means?* Solicit student ideas. You may want to provide students with the following definition of artificial intelligence: When computers do things that seem intelligent (or smart) in the same way that humans are intelligent.

5. **Tell the class they will create computer-generated voices by coding the Fake Voices app.** Note: The voices generated by mobile devices in the tutorial are not true deepfakes because they do not use artificial intelligence, but they are still pretty convincing!

Start the programming Activity (45 minutes)

6. If you built your own Fake Voice app before class, **demonstrate your app to the class**. Alternatively, show a picture of the finished app (**slide 4**).

7. **Provide the tutorial link** to students or student groups:

   http://ai2.appinventor.mit.edu/?locale=en&repo=http://appinventor.mit.edu/yrtoolkit/yr/aiaFiles/ Fake_Voices/FakeVoices_Starter.asc

   (You may want to email the link to students or share it with the slideshow.)

8. **Set students up to follow the section "The Fake Voices Tutorial (Level: Beginner)"** shown on **slide 5**. For beginner coders, you may want to follow along with students for the first few parts of the tutorial (up to Test the Speech Recognition).

9. **Support students as they do the activity.** As students get their apps working, remind them to exercise caution around using the app at home or around school. Don't fake anyone out!

Note: If one class is not enough for this activity, extra class time can be used to finish apps, perform additional testing, and experiment with modifications to the code.

Homework: Share the link to the deepfake media quiz from YR Media, **Doing a Double Take: Four Deepfake Scenarios that Mess with Our Minds** (**https://interactive.yr.media/double-take-four-deepfake-scenarios/**) and ask students to record their choices for the quiz and provide a one-sentence answer for why they made each choice.

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Lesson 2: From Fake Voices to Deepfakes (50 minutes)

Overview

- Students discuss the computer voices they generated in the app and compare those with genuine deepfakes.
- Students gain a basic understanding of how deepfakes are generated by artificial intelligence.
- In groups, students explore various categories of deepfakes and begin to consider possible societal impacts.
- Use this lesson to surface ethical questions about the role of AI in society.

Learning Objectives

Students will:

- Explain the basics of how computers generate deepfakes.
- Begin to consider the ethics of deepfakes.

Preparation

- ☐ Test video links in the teaching environment (some school networks prevent access to YouTube and other sites).
- ☐ Print out copies of the **handouts for each student group** (optional).

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Activity Steps

Introduce the Topic (10 minutes)

1. **Project the slide that shows the overview of the lesson** (**slide 6**) and briefly discuss agenda.

2. **Show the slide, "The Voices in Your App"** (**slide 7**)**, and ask students:**

   • *Did the fake voice in your app sound realistic?*

   • *How could fake voices be used to deceive someone?*

   • *What would make your synthetic voice sound better?* Students may say that the computer could mimic the way people really talk, with pauses and more expression.

3. **Show the video, JFK Unsilenced** (**slide 8**).

4. **Ask students about the difference between** the way their fake voice app sounds and the JFK deepfake. Students may say that the JFK deepfake sounds more lifelike, conveys the personality of a specific person.

   Inform students that deepfakes are made using artificial intelligence to learn from many examples of how real people talk. In fact, the name *deepfake* comes from "deep learning."

5. **Discuss possible ethical issues** with the Kennedy video (**slide 9**):

   • What positive uses could come from the Kennedy video?

   • What ways can you imagine that deepfakes could be misused?

Explore Deepfake Examples (35 Minutes)

6. **Ask students to form groups of 4 - 6** to watch and discuss examples of deepfake media.

7. **Show the deepfake categories** on **slide 10** and ask each group to pick a different category to analyze during this lesson: Commerce, Assistive Technology, Pop Music, History, or Crime.

8. **Ask groups to choose one student to take notes** on their category. Pass out the **handout to each student group**, and tell groups they can use the handout to take notes on the videos in their category. Briefly read the questions on the sheet aloud (**slide 11**):

   • Was a real person deepfaked in the video? Who? (If your group has two videos, write answers for both.)

   • What was convincing about the deepfake? What was not convincing?

   • Who made the deepfake (if known)?

   • Why do you think the deepfake was made? What do you think was the creator's intent?

   • Do you think the actual person who was deepfaked was happy to be copied or not? Why or why not.

   • In the future, how could this type of deepfake be used for good or harm?

9. **Show the videos to the whole class** ([slides 12 to 16](#) and listed below). As you go through each deepfake category:

- Announce the category. You may want to remind the group assigned to that category to take notes.
- Read the short descriptions of videos on the slides to orient students to the content.
- Tell students they will have time to discuss and present their ideas in the next session.

Category	Video Link	Time
Commerce	Google Duplex AI Assistant	(4:11)
Assistive Technology	Helping People with Loss of Voice	(2:52)
	An Actor Gets His Voice Back	(1:49)
Pop Music	A Pop Star Sings Again	(3:01)
	Jay-Z Reads Hamlet	(1:19)
History	Moon Disaster	(6:14)
Crime	Fake Voices Pull a Bank Heist	(3:38)
	Could AI-Powered Videos Cause an Economic Collapse?	(3:47)

Assignments for Next Session (5 minutes)

10. **Tell groups they will present their analysis** of deepfakes in their category in the next lesson. For today, ask groups to put one or two students in charge of presenting. (You may also want to collect filled-out handouts from groups for safe-keeping until the next session.)

Homework: Ask each student to write a one-page reflection on the future social impact of the examples in their category.

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Lesson 3: The Ethics of Deepfakes (50 minutes)

Overview

- Student groups predict possible impacts of deepfakes in their category and present their analysis to the class.
- Groups reconvene as a whole class to compare perspectives.
- Use this lesson to have students argue an ethical position with claims about the role of deepfakes in society, and to predict how these technologies might evolve in the future.

Learning Objectives

Students will:

- formulate an argument with claims about the ethics of deepfakes on society.
- make predictions how certain deepfakes may evolve in the future.

Preparation

- Before class, draw a horizontal line on the whiteboard/chalkboard with arrows in each direction (about arms' width). Label the ends "Beneficial" and "Harmful," as shown below:

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Activity Steps

Preparation for Group Presentations (15 minutes)

1. **Project the slide that shows the overview of the lesson** ([slide 17](#)) and briefly discuss agenda.

2. *Have students meet with their groups* to get ready for the presentation, and pass out the marked-up group handouts from the previous session (if you collected them). **Ask groups:** *After reflection, do you still agree with the answers you wrote?*

3. **Ask students to answer the questions on [slide 18](#) at some point during their presentations:**
   - According to your group, what are some possible positive or negative consequences of deepfakes like the ones in your category?
   - Make a prediction about how these types of deepfakes might evolve in the future.
   - What recommendations for laws or policies would your group make to government leaders or social media companies? Should videos like the ones in your category be supported or discouraged by them?
   - If your group does not have a definitive answer, what would you do to explore the consequences further?

4. **Request that student presenters write the group's category** somewhere on the line that's on the board:
   - *Where do you think your category fits?*
   - *Cite at least 2 reasons why your group has decided to place the category there?*

Group Presentations (25 minutes)

5. **Ask each group to take 3 - 4 minutes** to present and write their category on the board.

Wrap-Up Discussion (10 minutes)

6. **Ask the whole class:** *Does the placement of each category on the line make sense? Do you agree with other groups' decisions? Why or why not?*

Additional Resources

The following resources may provide further areas to explore on the topic of deepfakes:

- **How Audio Deepfakes Are Made** Scientific American's excellent technical backgrounder, [Can you tell the difference between a human voice and one made by machine learning?](#), goes over the history of fake voices and the current state of the art.

- [**Uberduck**](#) Celebrities and public figures are mimicked on this popular website. Students who want to add synthetic voice models to the Uberduck catalog can follow the [online tutorial](#).

- [**Media Literacy in the Age of Deepfakes**](#) In this MIT learning module, students investigate the history of misinformation and how to identify subtle deepfakes. In addition, *School Library Journal* [provides tips](#) on how to bring in your librarian to collaborate on a media literacy lesson.

- **YR Media Articles and Podcasts** The journalists at YR Media inspired this lesson with [Four Deepfake Scenarios](#), [Jay-Z Beefs with A.I.](#), and [Fake-Ish Podcast: Getting Real about Imposter Syndrome and Other Ways We Feel Fake](#).