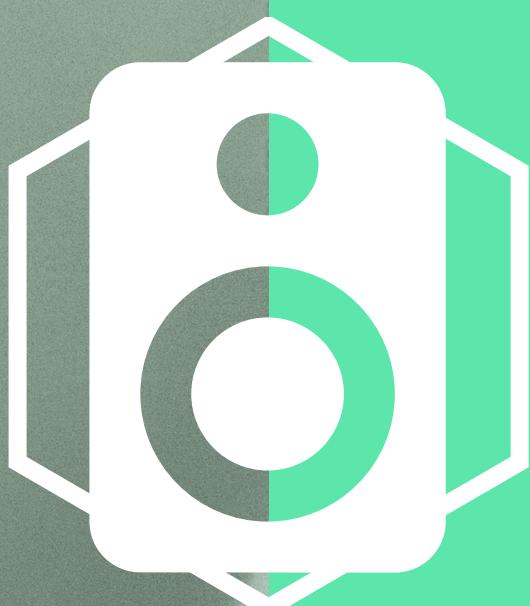


FALL 2020



# speakeasy

*Intelligent sound for the future*

TEAM ONE

Tristan Elma, Charlie Bennett, Matt Pisini

USC EE 542  
Prof. Young Cho



TEAM ONE

# A proactive speaker that reads the mood of the room

## SMART SPEAKERS AREN'T SMART ENOUGH.

1 in 4 American households today have a smart speaker. But as the smart speaker industry continues to grow, your choice of how you interact with these devices grows more similar. With dozens of models available, they all share a common downfall: smart speakers won't do anything smart unless they are told to do so. You shouldn't have to shout over your smart speaker when having a conversation, or tell it to turn the volume up when the right song starts to play. A true smart speaker should adjust itself accordingly. With **speakEasy**, we envision a future in which our technology understands us innately. People are dynamic, so why aren't our smart speakers?

## WHAT IS SPEAKEASY?

**speakEasy** is a premium smart speaker controller that automatically adjusts the volume of its music based on ambient sounds and the motion of people around it. Simply connect your **speakEasy** controller to any speaker, and you instantly have a state of the art Bluetooth capable smart speaker. But not just smart, **speakEasy** is intuitive. Our controller understands human nature—laughing, cheering, dancing, conversation—and adjusts speaker volume according to the mood and activity around it. With additional safety features, rest assured **speakEasy** brings the same vibe you do.

# EXPECT MORE FROM YOUR TECH.

01

### EFFORTLESS

**speakEasy** works without any commands from you

02

### VIBE

**speakEasy** adjusts its volume to match your vibe

03

### HEALTH

**speakEasy** can help you protect your hearing

04

### LIGHTWEIGHT

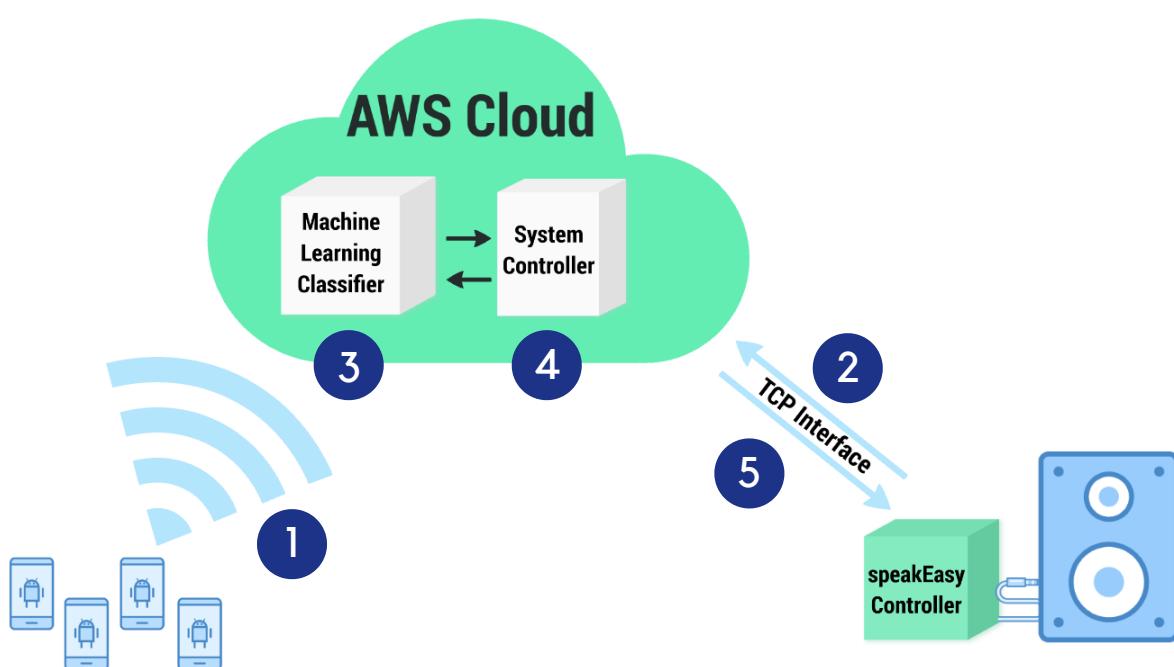
**speakEasy** can be added to existing speakers.



# A convenient system powered by Cloud AI

## THE TECHNOLOGY

**speakEasy** uses powerful AI to control itself so you don't have to. It begins to understand its environment by collecting accelerometer data from users' mobile devices, as well as recording audio through the built-in microphone. These two real-time data sources are streamed to an AWS cloud backend server for processing. Audio recordings are fed into a trained ML model that classifies audio based on music, speech, cheering, and laughter. Combining this with accelerometer data, **speakEasy** decides how to adjust the speaker's volume and communicates this back to the speaker controller.



1. Android accelerometer data sent to AWS cloud server over TCP.
2. Audio/speech recorded by speakEasy sent to AWS cloud server over TCP.
3. System controller inputs Audio data to feature extractor and machine learning classifier.
4. Results from the audio classifier along with accelerometer data are processed by the system controller to determine speaker output.
5. System controller sends speaker commands to speakEasy over TCP.