August 2021

ADAPTIVE AUDIO MANAGE MECHANISM

HP INC

Adaptive Audio Manage Mechanism

Abstract:

Remote work is becoming a mainstream of working type. The virtual working type is giving a chance to workers that they can work anywhere and anytime if their working desktop is capable to perform effectively in different working environment. Audio input and output devices are very important accessories to help on working productivity, and users need to manage them very carefully from using speakers and mic while they switch every meeting session. This innovation concept is trying to provide a friendly and a smart audio management mechanism so that users don't need to check audio devices while using. Instead, this smart audio management system can auto detect which audio device is better for users by determining current working scenario and environment. It can predict which preferable audio devices for users and then switch it so that we can provide a seamless user audio experience in different working sessions. The audio management can learn from user behavior from user data and device data as well as detect audio devices so that it can manage audio devices on behalf of users.

Prior Solutions:

Most users have multiple audio output devices to fulfil their use experience under different situation, list an example as below table,

	Home	Office	Commute	Public place
Virtual meeting	USB Headset	USB Headset	Wireless Headset	USB Headset
Movie/Music player	• Internal SPK • External SPK	• USB Headset • Wireless Headphone	Wireless Headset	Wireless Headset
Gaming	• Speaker • USB Headset	USB Headset	Wireless Headset	Wireless Headset

According to the table, we can find there are more than one audio input/output devices used by this user. Including internal MIC/SPK, audio jack headset, USB headset, external SPK and wireless headset, etc.

However, even the external audio device has been plugged in system, user still need to change the default device and volume bar **manually**.
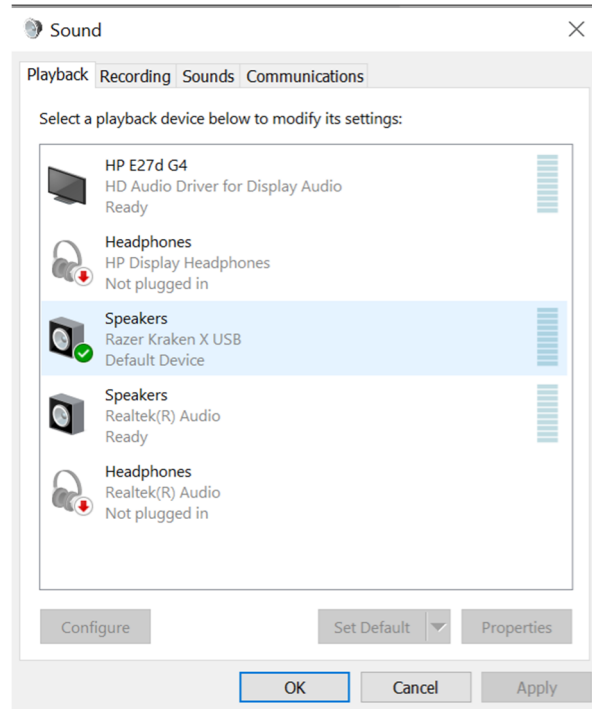
Furthermore, audio endpoint setting might be overwritten by UWP so it will be different to OS setting page, it will let user be confused and causing some inconveniences.
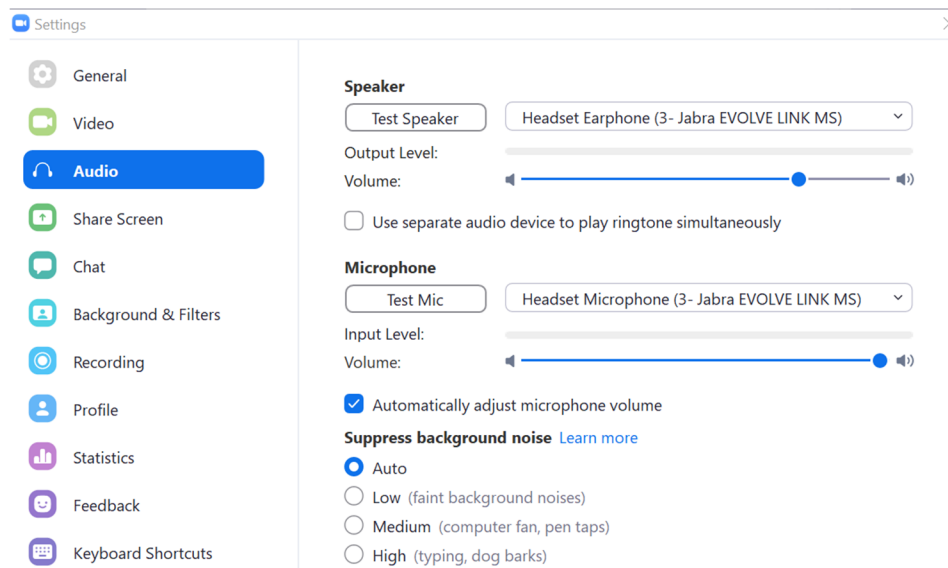
Problem Solved:

Nowadays, as more and more computer peripherals, like audio device, docking device, monitor...etc. attached, and the working place is not limited only in the office, user spend more time to config the audio device and the audio input/output setting.
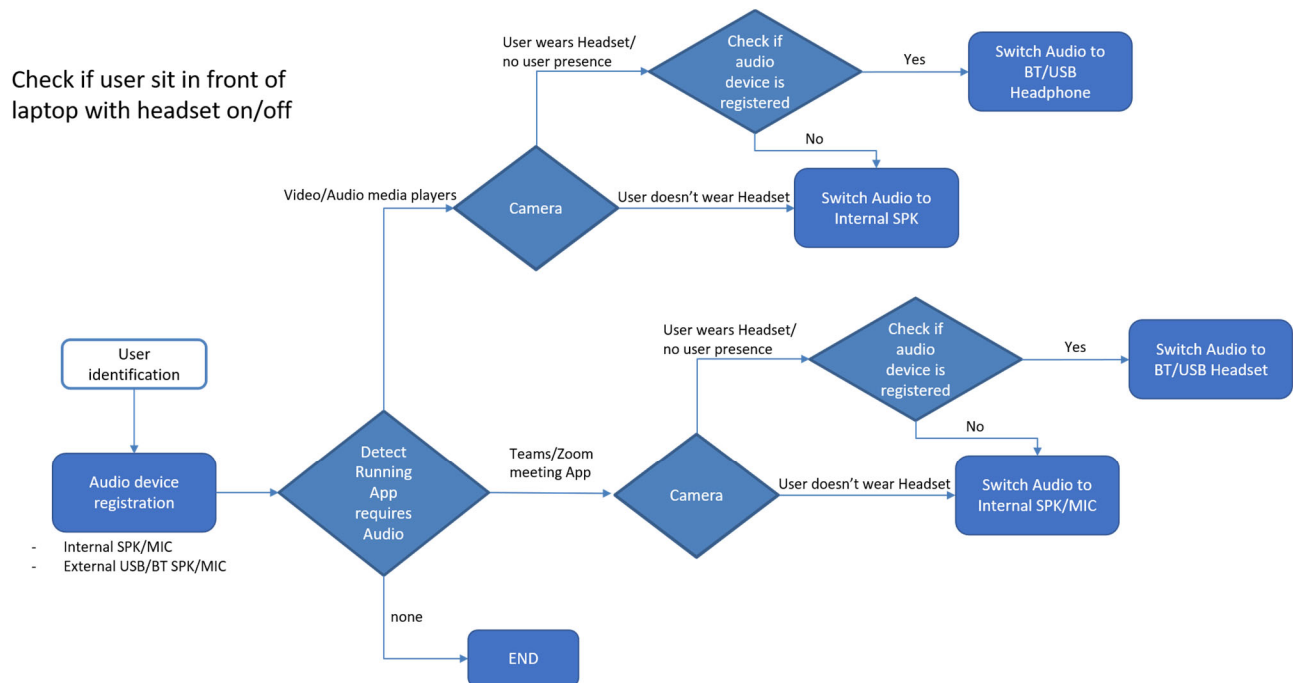
System can smartly help user to configuration the right audio device and provide the appropriate volume/sound effect setting based on user work scenario. To improve the user experience.

A Laptop with this invention enabled will make your daily work more productive and save time.

Concept Flow Chart:
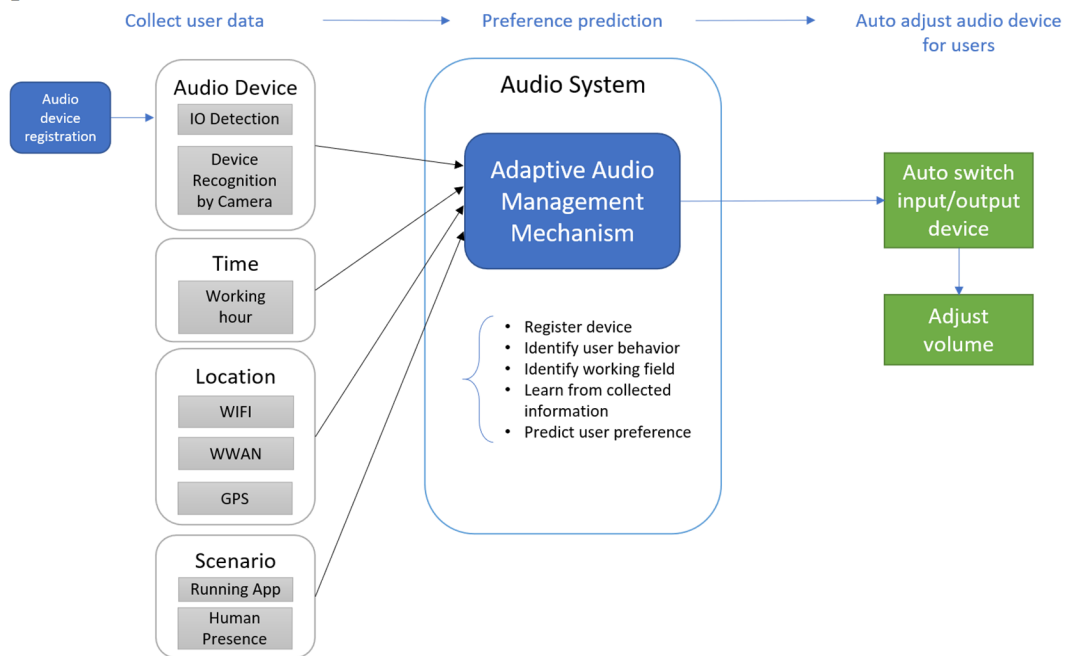
User scenario with Adaptive Audio Manage Mechanism:

- Step 1: Register audio devices, then identify audio devices connect at the PC.

- Step 2: Collect user data, ex:
  Location: wifi\wwan\GPS
  Audio device connection: using camera to distinguish which device been using.
  Background Volume: Mic
  Timing: Working hour, leisure time.
  Scenario: human presence sensor, Application running.

- Step3: Based on user data to
  Identify user behavior
  Identify working field
  Learn from collected information

- Step4: Predict user preference
  Auto switch adaptive audio device.
  Adjust volume of audio more accurate based on user environment.

Advantages:
- Automatic switch different audio device.
- Improve audio device user experience.
- Adjust volume of audio more accurate based on user environment.
- Protect secure information Vulnerability.

Disclosed by Flora Lai, Winnie Weng, Tina Chu and Ashley Lu, HP Inc.