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## Smart Notifications, Assistance, and Cues Using Audio Smart Glasses

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## **Smart Notifications, Assistance, and Cues Using Audio Smart Glasses**

### **ABSTRACT**

This disclosure describes computer-vision enabled smart glasses that provide timely and context-sensitive notifications and cues via an audio interface. Examples of audio notifications, assistance, and cues include styling help and feedback, safety alerts, navigation assistance, health-tracking and health-related statistics, assistance in social situations, etc.

### **KEYWORDS**

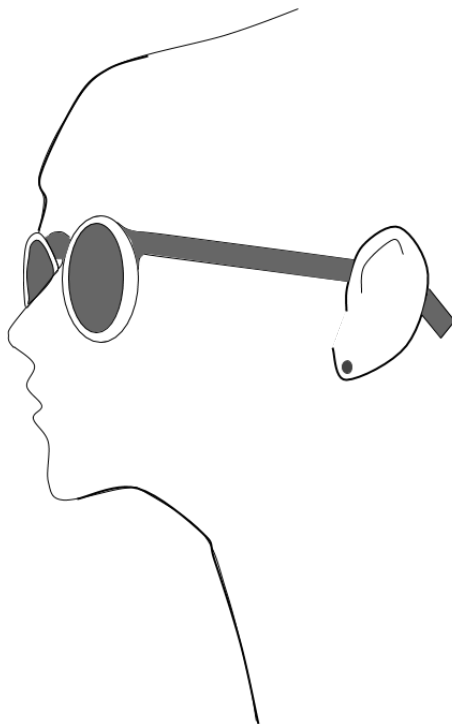
- Smart glass
- Audio glasses
- Audio smart glasses
- Personalized audio experience
- Audio UI
- Augmented reality

### **BACKGROUND**

Smart glasses or head-mounted displays (HMDs) today generally rely on displays, e.g., virtual displays, to convey information to a user that wears the device. Such virtual displays can, on occasion, interfere with the processing of the real world by the user.

### **DESCRIPTION**

This disclosure describes computer-vision enabled smart glasses that provide timely and context-sensitive notifications, assistance, and cues to a user via an audio interface.

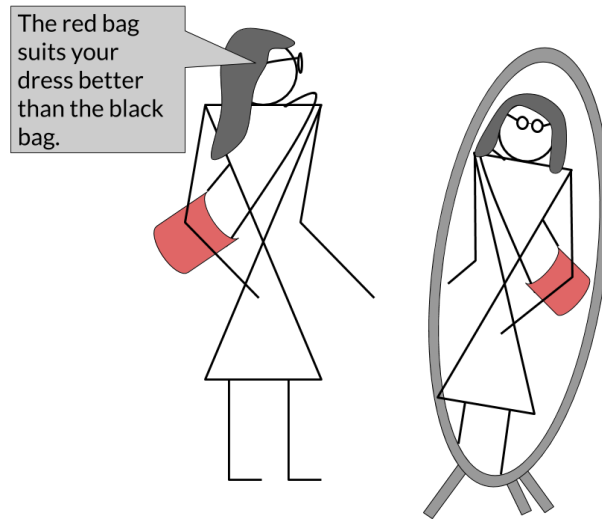


**Fig. 1: Audio smart glasses**

As illustrated in Fig. 1, audio smart glasses can have an external appearance substantially similar to ordinary glasses. The audio smart glasses as described herein include various onboard components such as cameras, computer-vision units, microphones, speakers (e.g., bone conduction speakers), stereo audio, global and local positioning systems, wireless audio such as Bluetooth, motion capture and tracking units, a processor configured with machine learning models, voice-recognition units, proximity sensors, inertial measurement units, internet connectivity units, etc.

Speakers of the audio smart glasses are positioned such that audio messages are played in close proximity to the glasses, audible exclusively to the user. The use of audio smart glasses is illustrated by the following examples.

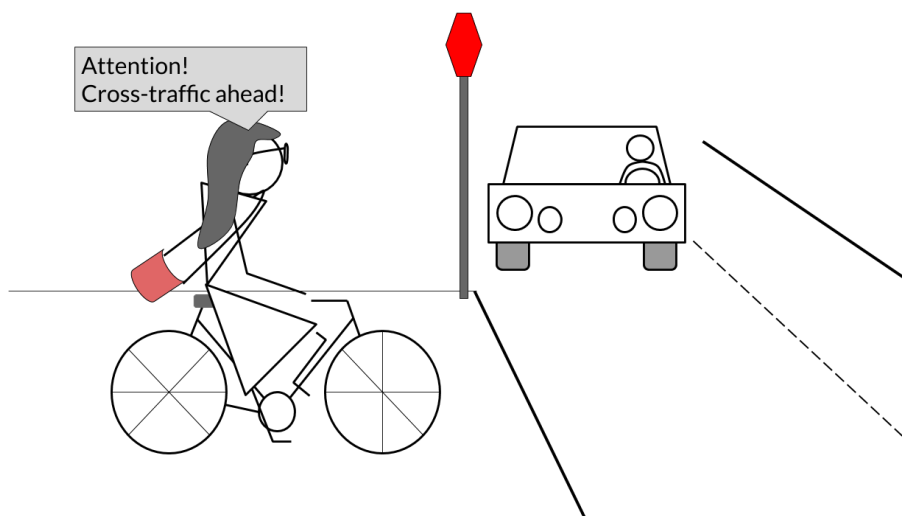
Fashion or style assistance



**Fig. 2: Fashion or style assistance**

As illustrated in Fig. 2, per the techniques of this disclosure, audio smart glasses can provide fashion or style assistance in a real-time manner. In the example of Fig. 2, the onboard computer vision units detect that the user is grooming herself, and answers fashion-related queries by, for example, referring to techniques that can classify images by fashion or style.

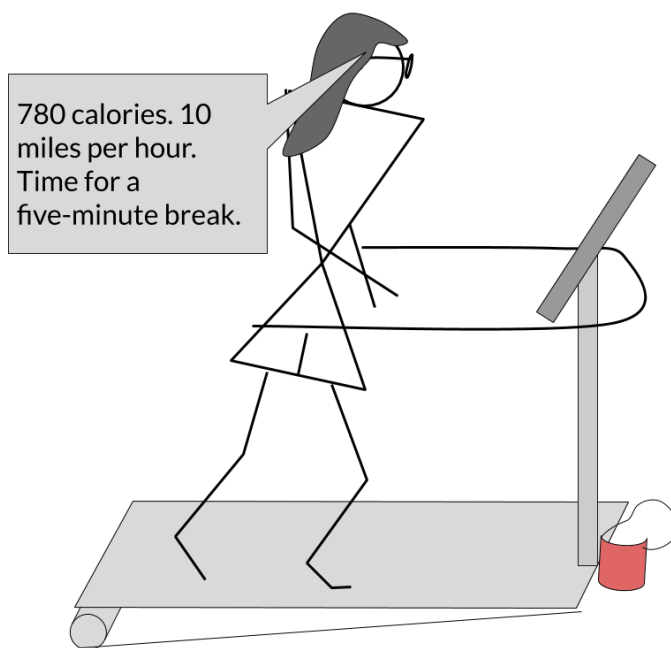
Navigation and safety



**Fig. 3: Navigation and safety**

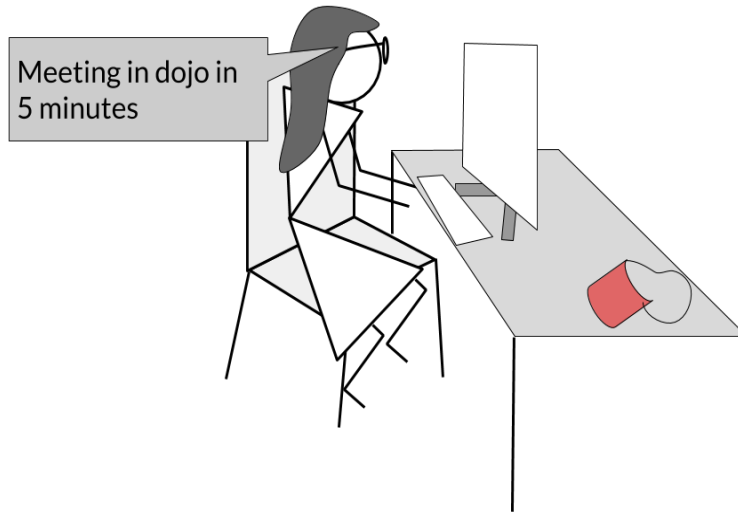
As illustrated in Fig. 3, per the techniques of this disclosure, audio smart glasses can provide navigation or safety assistance. The onboard computer vision units automatically detect hazards on the user's path and alert the user. The onboard GPS and mapping units provide navigation assistance to the user.

Guidance during a workout



**Fig. 4: Guidance during a workout**

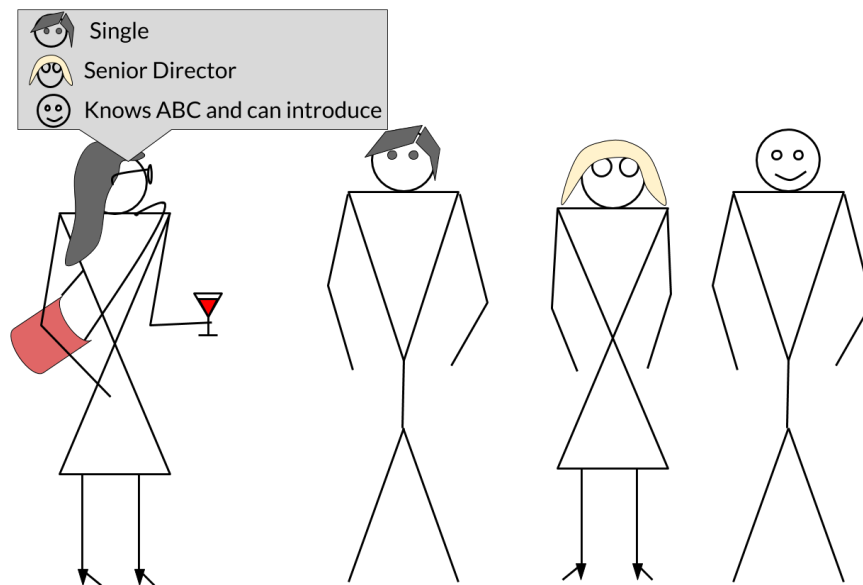
As illustrated in Fig. 4, per the techniques of this disclosure, audio smart glasses can provide guidance during a workout, e.g., on a treadmill or other equipment, or during other exercise. Onboard sensors track the amount of time spent, distance run, calories expended, or other workout-related measures, and guide the user based on the user's profile. The smart glasses can also maintain health statistics of the user.



**Fig. 5: Reminders at work**

As illustrated in Fig. 5, per the techniques of this disclosure, audio smart glasses can provide spoken reminders to the users through the course of a day. Reminders can be based upon information in the user's calendar, social media presence, etc., obtained with user permission.

Context in social situations



**Fig. 6: Context in social situations**

As illustrated in Fig. 6, per the techniques of this disclosure, audio smart glasses can provide the user with context and assistance in social situations. The onboard computer vision units detect and recognize faces in the user's field of vision and determine from online sources available information pertaining to the recognized people that is likely of relevance to the user. Such information is provided to the user via an audio interface, enabling the user to engage in interaction with others in their vicinity whom they may not recognize readily.

## **CONCLUSION**

This disclosure describes computer-vision enabled smart glasses that provide timely and context-sensitive notifications and cues via an audio interface. Examples of audio notifications, assistance, and cues include styling help and feedback, safety alerts, navigation assistance, health-tracking and health-related statistics, assistance in social situations, etc.