



AI-BASED HEARING AID TRANSLATOR USING MOBILE APPLICATION

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ABSTRACT: Modern online technologies make it relatively easy to maintain communication among a sizable and diverse audience. Additionally, since much web material is text-based and multimedia-based, some individuals with special needs, such as the deaf and hard of hearing, find it challenging to obtain information or interact with hearing individuals. This issue arises from a lack of facilities that enable learning sign language for hearing people or text translation into sign language for hearing-impaired people. In this regard, we offer in this paper a method for developing a mobile system that translates one language into sign language using a virtual signing agent, based on web services, X3D, and the Android operating system. The primary benefit of this work is that it may be used to teach sign languages and to translate unknown language into sign language for deaf individuals.

Keywords: hearing-impaired, text-translation, sign language, Android operating system, deaf individuals

Introduction:

Disability is a physical limitation, intellectual, mental, and sensory of someone in the long-term interaction with the environment, which causes obstacles and difficulties in participating fully and effectively. However, even with the exciting limitations of persons with disabilities had tried hard to adapt. One of these sensory disabilities is a disturbance that occurs in vision or hearing.

Deafness is someone who has a defect of the organ of hearing, resulting in hearing of inability with varying degrees of hearing ranging from mild (hard of hearing) to very severe (deaf) with a temporary or permanent duration. Physically, deaf people or not different from Normal people but have barriers when communicating. The biggest impact directly faced by deafness is the inhibition of verbal communication both expressively or speaking, and receptively which is to understand the conversation conveyed by the interlocutor.

In addition, deaf people also cannot control the strength of their voice when speaking, sometimes they do not make a sound or even speak in a loud voice but their articulation is not clear. This makes it difficult for them to communicate and sometimes consider disturbing others. In this study, the general intelligence of deaf people is not different from other normal people, namely normal. The low achievement of the deaf person is not due to the lower intelligence, but because the deaf person cannot maximize their intelligence. Aspects of intelligence originate from verbal or are often low, but aspects of intelligence originating from vision and motor skills develop rapidly.

With the development and advancement of technology today, especially in the field of telecommunication networks, it is undeniable that the internet is needed in the daily life of all people regardless of social status. With these advances, an innovation called the internet of things emerged that all the technological devices can be controlled remotely by a wireless network to be more efficient and save time. The internet of things aims to extend the benefits of continuously connected network connectivity through embedded always-on sensors, with the use of data sharing remote control and sensor reception including objects.

METHODOLOGY:

ANDROID BLE DEVICE:

This is to propose the AI-based hearing aids language translator app discussed as follows:

In the GAP setting, the IOS/Android mobile is often the primary device, with the BLE attachment serving as the peripheral. It should be noted that the roles stated here are only hypothetical; an iOS/Android smartphone can also function as a peripheral (With limitations)

The `startscan()` function is used to locate BLE devices. as an argument, this method accepts a scan callback. This callback must be implemented because that is how scan results are returned. because scanning consumes a lot of battery Power, you should follow the following guidelines:

1. Stop scanning as soon as you discover the appropriate device.
2. Never scan in a look and always restrict your scanner. A previously available device may have moved out of range, and continuing to scan consumes the battery.

The BLE app enclosed an activity (`DeviceScanActivity`) in the following example to scan for accessible Bluetooth LE devices and show them in a list to the user. The following code sample demonstrates how to initiate and terminate a scan:

```
private BluetoothLeScanner bluetoothLeScanner = bluetoothAdapter.getBluetoothLeScanner();
private boolean scanning;
private Handler handler = new Handler();

// Stops scanning after 10 seconds.
private static final long SCAN_PERIOD = 10000;

private void scanLeDevice() {
    if (!scanning) {
        // Stops scanning after a predefined scan period.
        handler.postDelayed(new Runnable() {
            @Override
            public void run() {
                scanning = false;
                bluetoothLeScanner.stopScan(leScanCallback);
            }
        }, SCAN_PERIOD);

        scanning = true;
        bluetoothLeScanner.startScan(leScanCallback);
    } else {
        scanning = false;
        bluetoothLeScanner.stopScan(leScanCallback);
    }
}
```

#JAVA

NOTE: Please remember that BluetoothLeScanner can only be accessed via the Bluetooth Adapter if Bluetooth is currently enabled on the device. GetBluetoothLeScanner() returns null if Bluetooth is not enabled.

Scan for just specified sorts of peripherals, use startScan (ListScanFilter>, ScanSettings, ScanCallback), which takes a list of ScanFilter objects to limit the devices that the scan searches for and a ScanSettings object to provide scan settings.

The code example below is an implementation of ScanCallback, the interface used to communicate BLE scan results. When results are discovered, they are placed on a list adapter in the DeviceScanActivity for the user to view.

#JAVA:

```
private LeDeviceListAdapter leDeviceListAdapter = new LeDeviceListAdapter();

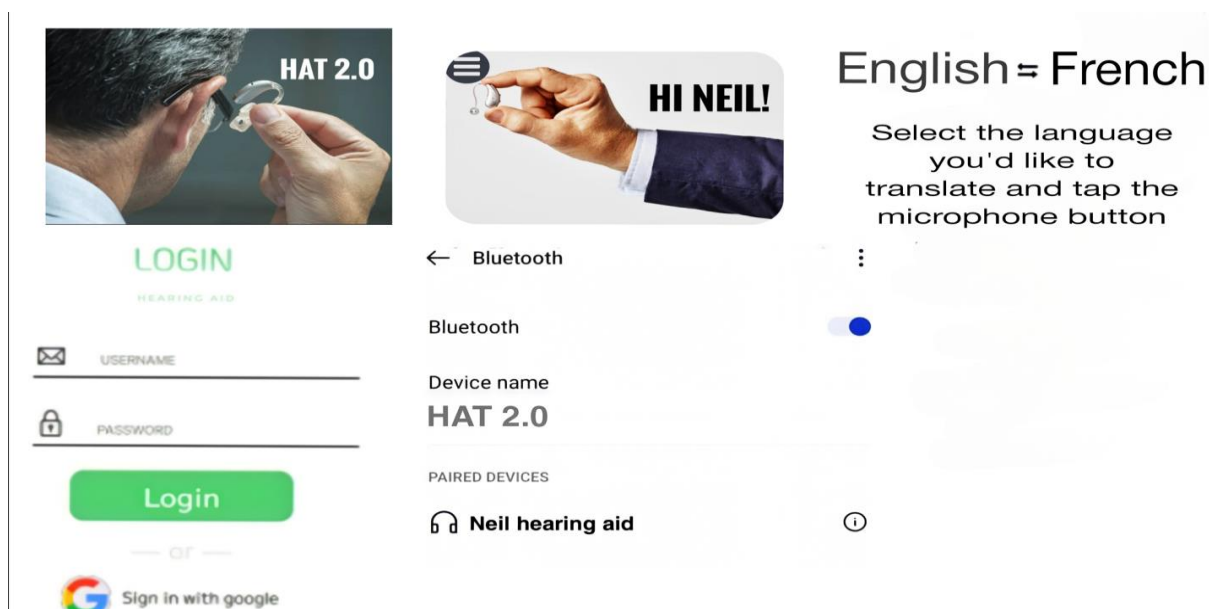
// Device scan callback.
private ScanCallback leScanCallback =
    new ScanCallback() {
        @Override
        public void onScanResult(int callbackType, ScanResult result) {
            super.onScanResult(callbackType, result);
            leDeviceListAdapter.addDevice(result.getDevice());
            leDeviceListAdapter.notifyDataSetChanged();
        }
    };
```

NOTE: Please keep in mind that you can only scan for Bluetooth LE devices or traditional Bluetooth devices, as indicated in the Bluetooth overview. You cannot simultaneously search for Bluetooth LE and conventional devices

APP FOR HEARING AID:

The app will display a Bluetooth connectivity button which you can pair with your hearing aids. then, you can use the translator to translate the language which is an Android-based design.

RESULT:



CONCLUSION:

This program was created to recognize and capture a hearing-impaired person's hand gesture. The program then converts it to textile audio. "The internet becomes such a significant path of their life for hearing-impaired folks, and is especially vital for communication," said Yan Auerbach, co-founder of Speech Trans. "We are utilizing the power of technology to facilitate richer in-person discussions across language boundaries with our new hearing-impaired version. We give a more spontaneous discussion at a fraction of the expense of the best other pricey translation programs that just offer text-to-speech translation".

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